Monday, December 02, 2013
08:30-10:00 AM • MSRO24 • Room: S103CD • BOOST: Gynecology-Anatomy and Contouring (An Interactive Session)
08:30-10:00 AM • RC210 • Room: S405AB • First Trimester Ultrasound
08:30-12:00 PM • VSPD21 • Room: S102AB • Pediatric Radiology Series: Fetal - Neonatal Imaging
10:30-12:00 PM • MSRO25 • Room: S103CD • BOOST: Gynecology-Integrated Science and Practice (ISP) Session
01:30-03:00 PM • MSCM23 • Room: S100AB • Case-based Review of Magnetic Resonance: Woman's Imaging (An Interactive Session)
03:00-04:15 PM • MSRO26 • Room: S103CD • BOOST: Gynecology-Case-based Review (An Interactive Session)

Tuesday, December 03, 2013
07:15-08:15 AM • SPSC30 • Room: E350 • Controversy Session: Fibroid Therapy: UAE vs Focused US
08:30-10:00 AM • RC310 • Room: S405AB • Second and Third Trimester Obstetrical Ultrasound
03:00-04:00 PM • SSJ11 • Room: E351 • Genitourinary (Imaging of Pregnancy and Its Complications)

Wednesday, December 04, 2013
08:30-10:00 AM • RC510 • Room: S405AB • Advances in Gynecologic Ultrasound
08:30-10:00 AM • RC550 • Room: E260 • Fallopian Tube Catheterization (Hands-on Workshop)
10:30-12:00 PM • SSK23 • Room: E353A • Vascular/Interventional (Venous Access/Women's Intervention)

Thursday, December 05, 2013
08:30-10:00 AM • RC607 • Room: N228 • GU Ultrasound 2013: The Expert's Update on Kidney, Gynecologic and Testicular US
08:30-10:00 AM • RC608 • Room: E450A • The Acute Abdomen and Pelvis (An Interactive Session)
08:30-10:00 AM • RC629 • Room: E353B • Increasing Your Gynecological MRI Referral Base: Reaching Out to the Gynecologists (An Interactive Session)
08:30-10:00 AM • RC651 • Room: E261 • Emergency Body MRI: Vascular Emergencies, Abdominal Emergencies and the Pregnant Patient (How-to Workshop)
10:30-12:00 PM • MSES52 • Room: S406B • Essentials of Genitourinary Imaging

Friday, December 06, 2013
08:30-10:00 AM • RC807 • Room: N226 • Imaging and Treating Gynecologic Cancer 2013: What Really Works and What Is Most Cost Effective

Obstetrical Imaging Case of the Day

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LL-EDE3011
Moderator
Genevieve L Bennett , MD

PURPOSE/AIM
1) The five submitted Obstetrical Imaging cases will offer challenging ultrasound and MR images to practice visual interpretation skills, promote medical knowledge review, and enhance ability to summarize important findings to achieve a diagnosis.

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A Short Review of Antenatal Imaging of the Common Skeletal Dysplasias

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LL-OBE1121
Sarah Constantine , MBBS, FRANZC
Lynette Moore , BMBS

PURPOSE/AIM
1. To understand the salient features of skeletal dysplasias at antenatal ultrasound.
2. To differentiate between the lethal and non-lethal skeletal dysplasias at morphology scanning.
3. To review the classification of skeletal dysplasias, and features seen in the most common and recognizable dysplasias.
CONTENT ORGANIZATION
This presentation reviews the imaging findings of the most common skeletal dysplasias seen at antenatal ultrasound, with x-ray and pathologic correlation. Some of the less common, but characteristic dysplasias are also discussed.
SUMMARY
Skeletal dysplasias are characterized by abnormalities of cartilage and bone growth, resulting in abnormal shape and size of the skeleton, and disproportion of the long bones, spine, and head. While there are many skeletal dysplasias, four disorders comprise almost 70%: achondroplasia, thanatophoric dysplasia, osteogenesis imperfecta, and achondrogenesis. Around 25% of neonates with a skeletal dysplasia are still born, and one third die in the first week of life1, causing enormous stress to the affected families.

1. Dighe M et al. Fetal Skeletal Dysplasia: An Approach to Diagnosis with Illustrative Cases. RadioGraphics 2008; 28: 1061 – 1077.

Approach to MR and Ultrasound Imaging of Endometriosis, Adenomyosis, and Their Complications

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LL-OBE1122

Nicholas H Shaheen , MD
Saro Manoukian , MD
Daniel Kowal , MD

PURPOSE/AIM
The purpose of this exhibit is to differentiate endometriosis from adenomyosis by utilizing their characteristic imaging differences. Reliably differentiating these two entities aids in awareness and surveillance of their unique potential complications. Additionally, recognizing mimics of endometriomas can help guide clinicans towards appropriate therapy and may obviate the need for surgical intervention.
CONTENT ORGANIZATION
1. Review the pathophysiology of endometriosis and adenomyosis
2. Explain how to use characteristic imaging features on MR and ultrasound to differentiate between endometriosis and adenomyosis
3. Outline the potential complications secondary to endometriosis and adenomyosis and discuss mimics of ovarian endometriomas
SUMMARY
Endometriosis and adenomyosis have characteristic pathophysiologic, clinical, and imaging differences. Patients with endometriosis or adenomyosis can have a similar clinical presentation. Ultrasound and especially MR imaging with particular attention to the junctional zone can be of great utility in differentiating among these two pathologic processes. Accurate diagnosis is also important given that endometriosis has potentially more significant complications. Finally, differentiating ovarian endometriomas from potential mimics can obviate the need for more invasive procedures such as laparoscopy or oophorectomy.

Uterine Myomas Internal Vascularity and Pseudocapsule Neurovascular Bundle (PNB): Contrast Enhanced Ultrasound (CEUS) Assessment Compared to Dynamic MRI before and after Uterine Artery Embolization

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LL-OBE1123

Davide Orlandi , MD
Francesca Lacelli , MD
Chiara Martini , MChir
Daria Schettini , MD
Nicoletta Gandolfo
Giovanni Serafini , MD
Emanuele Fabbro , MD
Giulio Ferrero

PURPOSE/AIM
To illustrate dynamic CEUS imaging in the assessment of uterine myomas PNB and internal perfusion before uterine artery embolization and during follow-up.
CONTENT ORGANIZATION
CEUS allows the assessment of uterine myomas vascularity, especially in women of reproductive age being also free from ionizing radiation. Myomas and PNB vascularity is poorly visible with color-Doppler but is clearly recognizable using CEUS.
Vascularity assessment is helpful in differential diagnosis as well as for therapy choice (surgery or embolization), for intra-operatory embolization check and after therapy (size and vascularity follow-up).
The following teaching points will be highlighted:
• Morphology and vascular features of myomas.
• Morphology and vascular features of pseudocapsule neurovascular bundle.
• CEUS and MRI appearance before uterine artery embolization.
• CEUS intra-operatory vascularity check.
• CEUS and MRI follow-up after uterine artery embolization.
SUMMARY
CEUS allows an accurate assessment of uterine myomas vascularity. It is also a valid help during embolization and is comparable to MRI in the follow-up of such a therapy. When surgery is required, PNB CEUS assessment could aid the surgeon to reduce bleeding and musculature trauma, sparing the neuropeptide fibres with a favourable impact on a proper uterine healing and successive functionality.

Dual Energy CT of Ovarian Cancer: What Information Can Be Obtained? A Lot to Learn

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LL-OBE1124

Priya R Bhosale , MD
Dhakshina M Ganeshan , MBBS, FRCR
Eric P Tamm , MD
Revathy B Iyer , MD

PURPOSE/AIM
Dual energy CT is a newer technology which, acquires data sets simultaneously at two different photon spectra in a single CT acquisition, and is performed with fast kilovoltage switching at 140 and 80 kVp. By acquiring CT data at different photon energies, differences in material composition can be detected based on differences in photon absorption which may be helpful in assesing metastatic implants in patients with ovarian cancer.
CONTENT ORGANIZATION
1. Brief background of what is DECT.
2. Designing a DECT protocol for ovarian cancer imaging.
3. Possible indications for DECT imaging of ovarian cancer.
4. Using DECT images in the workup of ovarian cancer.
a. Using appropriately monochromatic energy images.
b. What are material density images and how can they be used in the context of ovarian cancer imaging
5. Use of specialized tools to analyze DECT data:
a. spectral Hounsfield unit curves
b. scatter plots
c. histograms
d. virtual atomic number.
6. Examples of specific applications of DECT in ovarian cancer imaging
SUMMARY
Knowledge of DECT techniques may be helpful in the staging and workup of ovarian cancer

Pelvic Floor MRI: A Primer and Quiz

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LL-OBE2230

Declan G Sheppard , MD

PURPOSE/AIM
To describe and illustrate the technique and reporting system for static and dynamic pelvic floor MRI and to reinforce this knowledge by means of a quiz.
CONTENT ORGANIZATION
The exhibit will address: 1. Functional pelvic floor anatomy.
2. The pathogenesis and compartmentalization of pelvic floor dysfunction.
2. Static and dynamic MRI imaging protocols.
4. The HMO classification system of pelvic floor relaxation and pelvic organ prolapse for standardized reporting and grading.
5. The anatomical evaluation of the urethral and vaginal supporting structures and the anal sphicter complex in pelvic floor dysfuntion.
6. To demonstrate the close relationship between certain anatomical defects and pelvic floor dysfuntion.
7. To demonstrate that similiar clinical symptoms may have different anatomical defects. This will then be followed by quiz cases to highlight the earlier teaching points.
SUMMARY
Following this exhibit, the reviewer will be aware that PFD is often multifactorial and that appropriate treatment planning requires adequate assessment of the pelvic floor anatomy and multicompartmental pathology. The reviewer will hopefully feel confident to offer pelvic floor MRI as PFD is very common (30% of women) and a major cause of morbidity and MRI has an important role in its management.

Pearls and Pitfalls of MR Hysterosalpingography

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LL-OBE2231

Mariana C Kucharczyk , MD
Maria N Napoli , MD
Natalia T Posadas , MEd
Andres Kohan , MD *
Santiago Gil
Carolina R Chacon , MD

PURPOSE/AIM
MR Hysterosalpingography has been scarcely reported in the available literature. Most of the published research refers to the feasibility of the method by presenting their results in small series of cases. Even fewer articles refer to larger groups, with the weaknessthat no solid standard of reference has been used in any of them, thus limiting the relevance of their findings. The purpose of this educational exhibit is to show the most common findings and the pearls and pitfalls of MR Hysterosalpingography (MRHSG) based on our experience in a study population that has also been studied with laparoscopic surgery as standard of reference.
CONTENT ORGANIZATION
A. Indications and contraindications of MRHSG
B. Brief overview of the technique
C. Pictorial review of the most common findings in MRHSG
D. Pictorial review of the pearls and pitfalls in MRHSG
E. Future challenges in MRHSG
SUMMARY
MRHSG is a useful and innocuous diagnostic study that allows for exquisite pelvic evaluation and identification of female infertility causes. This exhibit reviews
a. Indications and contraindications of MRHSG
b. Most common findings, pearls and pitfalls of the exam
c. Future challenges in MRHSG

O is for Ovarian Cancer: Pictorial Review of Primary Ovarian Cancer and Staging, and Ovarian Cancer Mimics

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LL-OBE2232

Stephanie Channual , MD
Cecilia M Jude , MD
Maitraya K Patel , MD

PURPOSE/AIM
1) Review the imaging appearance of ovarian cancer.
2) Discuss the pathways and patterns of disease spread and its relationship with the FIGO staging system.
3) Identify entities which can mimic ovarian malignancies.
CONTENT ORGANIZATION
The spectrum of ovarian malignancies will be discussed and imaging appearance will be presented based on the pathologic classification (epithelial, sex cord-stromal, germ cell and metastatic disease) of these tumors. These include serous and mucinous tumors, endometrioid, borderline ovarian tumors, clear cell carcinoma, Brenner tumor, transitional cell carcinoma, small cell carcinoma, teraroma, dysgerminoma, granulose cell tumor, and Sertoli-Leydig cell tumor. The FIGO staging of ovarian cancer will be discussed as well as relevant imaging features in evaluating local staging, locoregional and lymphatic spread, and distant metastases. Benign and malignant pathologies that may be confused with ovarian cancer will also be presented, such as tubo-ovarian abscess, endometriosis, hemorrhagic cyst, fibroid, peritoneal inclusion cysts, GIST, lymphoma, metastases.
SUMMARY
This exhibit will review the imaging spectrum of ovarian cancer at all stages with emphasis on pathways and patterns of disease spread. Knowledge of the various ovarian cancer mimics can avoid misdiagnosis and allow implementation of appropriate management.

Simplifying the Ultrasound Findings of the Major Fetal Chromosomal Anomalies

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LL-OBE2233

Joy Liau , MD, PhD
Cherng Chao , MD, JD
Lorene E Romine , MD
Katherine White
Sheena Harmon
Yoona Ho , BS
Dolores H Pretorius , MD *

PURPOSE/AIM
The fetal ultrasound markers and structural anomalies associated with the major chromosomal anomalies are organized and simplified to highlight the important spectrum of findings of each syndrome and reduce misdiagnoses. Misdiagnoses in fetal ultrasound may result in significant distress for expecting parents and may lead to wrongful birth lawsuits.
CONTENT ORGANIZATION
We review the major human chromosomal anomalies, including: Trisomies 21, 18 and 13, Turner's Syndrome and Triploidy. The focus is each syndrome's major first and second trimester structural anomalies and ultrasound markers (findings associated with increased risk of chromosomal anomaly but can be seen normally), and the role of clinical information such as maternal blood work and new genetic chromosomal testing. Since patients do not usually present for fetal ultrasound with a known diagnosis, a concise knowledge of ultrasound and clinical findings will alert radiologists to concerning cases and prompt a guided search for important associated anomalies.
SUMMARY
Fetal ultrasound can be challenging due to the many findings and sometimes technically difficult evaluation. By organizing the major chromosomal anomalies to simplify the ultrasound findings and highlight the role of clinical history, an informed search of a fetal ultrasound for specific findings can be performed, reducing misdiagnoses.

Re-evaluation of Perineal Masses in CT and MRI

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LL-OBE2234

Jiro Munechika
Yui Onoda , MD
Yoshimitsu Ohgiya , MD
Takehiko Gokan , MD
Nobuyuki Takeyama , MD
Toshi Hashimoto

PURPOSE/AIM
Various benign and malignant masses are seen in the perineum. Ultrasonography was usually enough to evaluate the masses with no CT or MRI. However, CT or MRI is useful for adequate evaluation of the mass if the mass is located deeply or is too big to see the detail in ultrasonography. The purpose is to re-evaluate the perineal masses in CT and MRI.
CONTENT ORGANIZATION
Normal MRI anatomy of the perineum was shown. Various masses arisen from the perineum were shown according to the anatomical structures of vulva, urethra, vagina, anus, and soft tissue. The imaging features of CT and MRI of various masses were shown. The various masses included labial hematoma, canal of Nuck hydrocele, urethral diverticulum, Skene's duct cyst, urethral lymphoma, Bartholin's duct cyst, vaginal leiomyoma, perianal abscess, aggressive angiomyxoma, etc. MRI was sufficient for evaluation in the most of the perineal masses. MRI was particularly useful to evaluate the tumor extention. However, CT was useful for evaluation of acute lesion.
SUMMARY
Various perineal masses were re-evaluated in CT and MRI according to location of the masses, such as vulva, urethra, vagina, anus, and soft tissue. Majority of the masses were feasible to make diagnosis in MRI alone. MRI was useful to see extent of malignant tumors. However, CT was useful for evaluation of hematoma and abscess.

Role and Pitfalls of Multimodality Imaging in Advanced Ovarian Cancer

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LL-OBE2235

Noushin Vahdat , MD
Bandar O Safar , MD
Namita S Gandhi , MD
Mehdi Kebria , MD
Shetal N Shah , MD

PURPOSE/AIM
To review the role and interpretive pitfalls of CT, MR and combined modalities (PET/CT, PET/MR) at detection, staging, monitoring treatment response and restaging of advanced ovarian cancer (stages III and IV).
CONTENT ORGANIZATION
CT is the current modality of choice for staging prior to cytoreductive surgery and postoperative monitoring of treatment response in advanced ovarian cancer. MR offers increased soft tissue contrast and is used as an alternate modality in patients with iodinated contrast allergy. It also provides valuable information in follow up of treated ovarian cancer with accuracy comparable to laparotomy. Cost and availability limit the use of MR. PET/CT is useful at initial staging, monitoring therapy and detection of recurrence, although it is prone to various artifacts and pitfalls from physiologic activity and inability to depict small, necrotic or mucinous lesions. PET/MR is an emerging technique with diagnostic accuracy comparable to PET/CT, increased soft tissue contrast and lower radiation.
SUMMARY

Appropriate selection of different modalities including CT, MR, PET/CT and PET/MR increases the ability to make accurate diagnosis and choose an appropriate management scheme. Familiarity with strengths and pitfalls associated with each modality can help optimize outcomes in advanced ovarian cancer.

Important Roles of 3D and Cine Sonography (US): Evaluation of Female Pelvic Floor after Synthetic Mesh and Sling Surgery

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LL-OBE2236

Beverly E Hashimoto , MD *
David L Coy , MD, PhD
Dawna J Kramer , MD
Blair Washington , MD
Una Lee , MD
Jennifer A McDowell , MA *

PURPOSE/AIM
1. Demonstrate normal translabial US anatomy of the female pelvic
2. Review the role of 3D US to evaluate complications of post-operative synthetic vaginal mesh including prolapse repair and midurethral slings.
3. Discuss cine US for identification of urogenital abnormalites in patients who have had mesh or sling surgery.
CONTENT ORGANIZATION
I. Normal Translabial US Female Pelvic Floor Anatomy II. US Imaging Synthetic Mesh and Slings -- Normal US appearance of synthetic mesh and slings --Complications of synthetic mesh and sling surgery such as abnormal placement, fragmentation of synthetic material, erosion of synthetic material into adjacent organs --Pitfalls: (1) multiple operations with different synthetic materials (2) infection III. Urogenital Structural and Motility Disorders Using Cine US. IV. Summary and Future Applications: --Postoperative evaluation to assess appropriate position of synthetic device --Correlate US findings of surgical technique and placement with clinical outcomes.
SUMMARY
1. Synthetic suburethral slings and mesh are echogenic and better demonstrated on US compared to MRI. 2. Transverse 3D US images better display the synthetic slings compared to the 2D parasagittal translabial imaging. 3. Cine US is useful in dynamic evaluation for urogenital abnormalties.

MR Imaging of Uterovaginal Anomalies: What Should Surgeons Know before Surgery?

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LL-OBE2237

Cecilia Santos Monton
Ricardo Corrales Pinzon
Manuela Martin Izquierdo
Karima El Karzazi
Jose F Ojeda Esparza , MD
Diana C Cuellar

PURPOSE/AIM
The objectives of this exhibit are to show how to recognize the common congenital uterine anomalies, how to classify and how to know the critical information which radiologists should give prior to surgery. Also, we must know the importance of this kind of anomalies in the study of infertility and multiple obstetric problems.
CONTENT ORGANIZATION
-Introduction
-Embryology
-Classification of Müllerian duct anomalies
-MR imaging features
-A useful radiological report
SUMMARY
MR is the technique of choice to detect Müllerian duct anomalies because of its high accuracy in the study of the female anatomy. Radiologists should know the common congenital uterovaginal anomalies and their classification. These kinds of anomalies must be considered in the study of women with fertility problems. Radiologists should provide surgeons a useful radiological report in order to be able to make an appropriate planning and guide them in a future surgical procedure.

Female Infertility: The Role of Imaging Science in the Diagnosis of Congenital and Acquired Causes

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LL-OBE2238

Katherine A Kaproth-Joslin , MD, PhD
Vikram S Dogra , MD *

PURPOSE/AIM
Infertility affects 12% of woman of reproductive age in the USA. Imaging via hysterosalpingography (HSG), ultrasound (US), and magnetic resonance (MR) plays an important role in the diagnosis/evaluation of infertility. In this presentation, we will present an image rich case based review of ovarian, fallopian tube, uterine, and cervical causes of female infertility, including congenital and acquired conditions. In addition, we will discuss the pearls and pitfalls of HSG, US and MR imaging in the assessment of female infertility.
CONTENT ORGANIZATION
-Normal uterine, fallopian tube, ovarian anatomy
-Imaging techniques: HSG, US, MR
-Congenital: Müllerian duct anomalies (Unicornuate, bicornuate, septate, arcuate, didelphys, infantile), gonadal dysgenesis
-Acquired:
Uterine: Submucosal fibroids, adenomyosis, endometrial polyp, synechiae, arterial venous malformation
Fallopian tube: Tubal occlusion, hydrosalpinx, salpingitis isthmica nodosa, tubal ligation device
Ovarian: Endometriosis, polycystic ovary syndrome, premature ovarian failure, ovarian hyperstimulation syndrome
Cervical: Stenosis
SUMMARY
Review the normal anatomy of the female reproductive system
Appreciate the pearls and pitfalls associate with the imaging modalities important in the imaging of female infertility
Understand the congenital and acquired abnormalities of the female reproductive system

Fetal Ovarian Cysts: Diagnosis, Management and Outcome

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LL-OBE2239

Tony W Trinh
Eric Scaife , MD
Anne M Kennedy , MD

PURPOSE/AIM

To review the features and differential diagnosis of fetal ovarian cysts (simple and complex), and to correlate with postnatal imaging and operative findings.
CONTENT ORGANIZATION
Background:
• Ovarian cysts are the commonest abdominal cysts in female fetuses but those observed prior to the third trimester are unlikely to be ovarian in origin.
Diagnosis:
• Spectrum of appearances on prenatal imaging: Simple, "daughter" cyst, fluid/fluid levels, septations, hemorrhage and solid-appearing.
Differential Diagnosis:
• GU cysts: Renal, urachal, hydrocolpos
• GI cysts: Enteric duplication, mesenteric, hepatic, choledochal
• Lymphangioma
• Fetus-in-fetu
Management:
• Most resolve spontaneously. Surgical options include laparoscopic fenestration and, for torsion, salpingo-oophorectomy vs. ovarian preservation.
• Case series: All diagnosed at >30 weeks gestation, 3 with daughter cysts
• 11/20 resolved spontaneously
• 2/20 resolved post fenestration
• 3/20 salpingo-oophorectomy for torsion
SUMMARY
Major teaching points are:
1. Ovarian cysts are the commonest intra-abdominal cyst in female fetuses but should NOT be considered in the first or early second trimester.
2. Daughter cysts are pathognomonic for ovarian origin.
3. Most fetal ovarian cysts resolve spontaneously. If operative intervention is required the goal should be ovarian preservation.

Peripartum Hemorrhage: What the Radiologist Need to Know and Do

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LL-OBE2240

Keisuke Yoshida
Noriko Nishimiya
Zenjiro Sekikawa
Shigeo Takebayashi , MD
Tomio Inoue , MD, PhD

PURPOSE/AIM
The purpose of this exhibit is:
1. To provide a comprehensive and systematic multimodality imaging review of obstetrical hemorrhagic emergencies.
2. To discuss the pathophysiology and clinical management of these conditions.
CONTENT ORGANIZATION
Massive hemorrhage caused by various disorders may threaten the well-being of the mother. They may occur anytime during the peripartum period, and mostly present as vaginal hemorrhage, but can occur in other organs. We will discuss the etiology and pathophysiology, diagnosis, treatment including relevant interventional procedures. Diagnostic pearls and pitfalls in cases of prepartum, primary postpartum and secondary postpartum hemorrhage will be illustrated. Emphasis will be placed on multidetector-row CT and MR imaging, highlighting pertinent imaging features.
SUMMARY
Despite continuous advances in obstetric medicine, peripartum hemorrhage continues to claim thousands of maternal lives worldwide. Imaging plays a key role in the diagnosis and clinical management; therefore, the radiologist should be aware of the most frequent aspects of these entities in order to make an accurate and timely diagnosis, and to proceed promptly to selective arterial embolization.

Role of MRI as an Adjunct to Ultrasound in Non-CNS Fetal Anomalies

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LL-OBE2241

Ingy Hanna , MD
Jacquelyn Copeland , MD
Nimisha Doshi
Mark A Flyer , MD

PURPOSE/AIM
The objective of this exhibit is:
1. To explain the utility of MRI in conjunction with ultrasound for prenatal evaluation of fetal anomalies/complex fetal anatomy.
2. To review the distinctive MRI features of several thoracic, gastrointestinal and genitourinary fetal anomalies.
3. To emphasize the importance and impact of pre-natal MR imaging on medical, religious and ethical decisions faced by the multi-disciplinary team and family.
CONTENT ORGANIZATION
1. Objectives
2. Background
- Sensitivity and specificity of fetal ultrasound and MRI.
- Role of MRI in improving diagnostic accuracy and stratifying decision-making/ treatment options. 3. Review of Fetal US and MR imaging findings in the following entities:
- Congenital cystic adenomatoid malformation (CCAM)
- Pulmonary sequestration
- Hirschsprung's disease
- Bowel malrotation
- Fused renal ectopia
- Hydronephrosis
- Rectal Prolaspe
-Hemangioma/Lymphangioma 4. Summary and Conclusions
SUMMARY
The major teaching points of this exhibit are:
1. MRI is a powerful instrument in the characterization of non-CNS fetal anomalies that are unclear on ultrasound or require further delineation.
2. Beyond distinguishing pathologies, MRI can contribute to well-informed treatment planning and family decision making.

Imaging Essure: How, When, and What to Look for

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LL-OBE2242

Javier Azpeitia Arman , MD
Rosa M Lorente-Ramos , MD, PhD
Pablo Aparicio Rodriguez-Minon
Francisco J Salazar Arquero
Jose C Albillos Merino , MD
Juan Gredilla

PURPOSE/AIM
To review and illustrate imaging evaluation of the irreversible fallopian tube occlusion device Essure: plain radiographs, hysterosalpingography, US, CT, MR with correlation with hysteroscopical images. To discuss the appropriate follow-up and management of patients after microinsert placement. To emphasize pitfalls, diagnostic difficulties and differential diagnosis of properly positioned devices and complications.
CONTENT ORGANIZATION
1. Essure placement: -Morphology of the device; -Clinical criteria for proper positioning. 2. Evaluation of the patient after insertion: -When to perform the exam; -Preferred imaging examination; -Hysterosalpingography technique in patients with Essure; -Imaging criteria for proper positioning on different imaging modalites and criteria of satisfactory occlusion. 3. Imaging of complications: -Essure migration (uterine or peritoneal cavity location -Tubal perforation; -Occlusion failure; -Rupture or unrolling of coils; -Pitfalls simulating patent fallopian tubes (venous intravasation, abnormal uterus).
SUMMARY
The major teaching point of this exhibit is to learn the appearance of the irreversible fallopian tube occlusion device Essure both clinically and on different imaging modalities. Increasing familliarity with the device will help to understand its proper positioning and complications in order to recognize them.

Magnetic Resonance Imaging of the Fetal Chest

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LL-OBE2243

Ashley E Prosper , MD
Christina Earhart , MD
Kristina E Hoque , MD, PhD
Daphne K Walker , MD
Suzanne L Palmer , MD *

PURPOSE/AIM

- Discuss indications and imaging protocol for MRI evaluation of the fetal chest
- Review the appearance of normal fetal developmental chest anatomy on MRI
- Discuss fetal intrathoraic extracardiac chest pathology and in utero interventions

CONTENT ORGANIZATION

1. MRI indications and imaging protocol
2. Normal fetal anatomy and developmental variants as seen on MRI
3. Comprehensive review of fetal chest pathology and in utero interventions
4. Select cases from LAC+USC Hospital, for which MRI aided in diagnosis

SUMMARY
MRI, when optimized with ultrafast acquisition techniques, can be a useful adjuvant imaging technique for the diagnosis of fetal chest abnormalities. The goal of this exhibit is to: 1. Discuss MRI indications and imaging protocol. 2. Review fetal thoracic developmental anatomy on MRI. 3. Review fetal intrathoraic extracardiac chest pathology and in utero interventions. 4. Present select cases from our institution that MRI aided in diagnosis.

Imaging of Solid Adnexal Masses

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LL-OBE2244

Justin E Costello , DO
Michael J Reiter , MD
Ryan B Schwope , MD
Christopher J Lisanti , MD *

PURPOSE/AIM
1. To review the anatomic structures and spaces within the female pelvis
2. To describe imaging findings that indicate a mass arises from either the intra- or extraperitoneal space
3. To list the gamut of pathology that may present as a solid adnexal mass
4. To recognize key radiologic findings which narrow the differential diagnosis
CONTENT ORGANIZATION
1. Anatomy of the female pelvis
2. Imaging findings which indicate the intra- or extraperitoneal origin of a mass based on its relationships with other structures
A. Ureter displacement
B. Gonadal or mesenteric vein continuity
C. Bridging vascular sign
3. Distinguishing purely solid from mostly solid adnexal masses
4. Spectrum of causes of a solid adnexal mass
5. Specific radiologic features which narrow the differential diagnosis
A. Hypervascular mass
B. Fat containing mass
C. T2 hypointense mass
SUMMARY
While not as common as their cystic counterparts, solid adnexal masses are frequently encountered in everyday practice. Primary ovarian neoplasms and exophytic fibroids comprise the majority of these lesions; however, the true scope is far more diverse. This exhibit will familiarize radiologists with anatomic clues as well as characteristic imaging findings of numerous solid adnexal masses that will aid in diagnosis.

Fetal MRI: Embryology, Anatomy and Pathology of Posterior Fossa

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LL-OBE2245

Manuel Recio Rodriguez
Pilar Martinez Ten
Begona Adiego
Vicente Martinez De Vega , MD *
Javier Carrascoso Arranz
Javier Perez Pedregosa

PURPOSE/AIM
The aim of this exhibit is to: - Specify the normal US and MRI anatomy of the developing fetal posterior fossa.
- Describe posterior fossa pathologies amenable to prenatal diagnosis.
- Establish a diagnostic imaging strategy for posterior fossa abnormalities.
CONTENT ORGANIZATION
Posterior fossa malformations are among the most common brain anomalies identified by current fetal imaging techniques. A good knowledge of embryology and anatomy of the posterior fossa is mandatory to analyse the US and MR images. Although US remains the primary imaging method for routine examination of the developing fetal brain, MRI provides better soft-tissue contrast, especially within the PF . We describe posterior fossa pathologies: Chiari's malformations, Dandy Walker malformation, vermian agenesis, vermian hypoplasia, rombencephalosynapsis, Joubert syndrome, cerebellar hypoplasia, pontocerebellar hypoplasia, cerebellar atrophy, mega cisterna magna, posterior fossa arachnoid cyst, Blake pouch cyst (delayed closure of the vermis) unilateral cerebellar damage, PHACE syndrome, fetomaternal infection (CMV), cerebellar hemorrhage. and occipital meningocele We establish a diagnostic algorithm based on radiological findings.
SUMMARY
A systematic analysis of the posterior fossa in fetal MRI makes it possible to diagnose accurately most posterior fossa malformations.

Malignant Transformation in Pelvic Endometriosis: Imaging Techniques and Interpretation Top Tips

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LL-OBE2246

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PURPOSE/AIM
1.Briefly review the epidemiology & clinical features of endometriosis. 2.Discuss the imaging techniques for evaluation of malignancy & the added value of specific techniques (eg.contrast enhanced MRI with subtraction). 3.Provide a concise pictorial review of multi-modality imaging features seen with complex pelvic endometriosis & malignant transformation.
CONTENT ORGANIZATION
- Epidemiology of pelvic endometriosis & malignancy arising on this background - Clinical/pathological features - Imaging techniques - Pictorial review of malignancy arising in endometriosis
SUMMARY
Endometriosis is a common benign gynecological condition occurring in 3-10% of pre-menopausal women with a spectrum of appearances ranging from

endometriomas to deep pelvic disease.These women have an increased risk of developing epithelial ovarian cancer,an important complication to be aware of & detect early.Surgically,these complex patients are often challenging due to the presence of fibrosis,blood products & adhesions which can result in difficult image interpretation and incomplete surgical resection. Therefore optimal imaging and focused radiological assessment are essential to guide management. This educational exhibit will discuss and illustrate the role of imaging in endometriosis and in particular the techniques employed for early detection of malignant transformation.

Differential Diagnosis of Low Signal Intensity Ovarian Lesions on T2-weighted MR Images.

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LL-OBE2247

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PURPOSE/AIM
The purpose of this exhibit is: 1. To review the protocol of pelvic MR examination, including preparation and gel administration, to obtain an excellent quality study; 2. To review the differential diagnosis of low signal intensity ovarian lesions on T2-weighted images, including fibromas, Brenner tumor, endometriomas, calcified lesions, etc... 3. To demonstrate how to differentiate a solid lesion from a cystic or hemorrhagic lesion based on contrast administration and subtracted images. 4. To narrow the differential diagnosis of those ovarian lesions based on imaging characteristics, contributing for a correct treatment and surgical planning.
CONTENT ORGANIZATION
1. Review of pelvic MRI examination protocol; 2. Differential diagnosis of ovarian lesions with low T2-weighted signal intensity; 3. Review imaging findings of transvaginal ultrasound and MRI; 4. Sample of cases of ovarian lesions, including fibromas, Brenner tumor, endometriomas and etc... 5. Use of IV contrast injection to differentiate solid ovarian lesion from hemorrhagic and other cystic lesion; 6. Subtracted images; 7. Summary.
SUMMARY
Knowledge of this relatively small group of ovarian lesions with low signal intensity on T2-weighted MR images may allow a specific diagnosis or a substantial narrowing of the differential diagnosis driving to an appropriate patient management.

Twin Pregnancy: Imaging Features and Concerns Unique to Twinning

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LL-OBE2248

Sowmya Mahalingam , MD
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Mariam Moshiri , MD
Theodore J Dubinsky , MD

PURPOSE/AIM
Twin pregnancies are considered high risk due to the multiple associated complications.The initial step is to assign chorionicity as monochorionic twins are at higher risk.The prupose of this exhibit is to describe all aspects of antenatal imaging with respect to twin pregnancy.
CONTENT ORGANIZATION
1. Zygosity and Chorionicity

- Dizygotic twins- two unrelated fetuses growing together.
- Monozygotic-dichorionic-diamniotic, monochorionic-diamniotic, monochorionic-monoamniotic and conjoined.
- Chorionicity marker- the twin peak sign and the delta sign.
- Amnionicity marker- number of yolk sacs and the visibility of membrane.

2. Complications of monochorionic pregnancy For eg- *Twin Twin Transfusion Syndrome, Twin Reversed Arterial Perfusion, Amniotic bands and Conjoined twins*. **3. Syndromes-** Frequency of concordant and discordant syndromes **4. Death of one twin**- fate of the other in mono versus dichorionic twins. **5. Fetal interventions in twins** For eg, *selective reductions*- when a necessity and when contraindicated; *amniocentesis and risks*- karyotyping both versus single twin, and *laser ablation* in TTTS. **6. Prognosis and mode of delivery**
SUMMARY
After reviewing this exhibit, the viewer will have a complete idea about the antenatal imaging of twin pregnancies, including available interventions.

Update on MR Imaging for Evaluating Primary Fallopian Tube Carcinoma: Review of Clinicopathologic Correlation

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LL-OBE2249

Mina O Asatani , MD, PhD
Akiko Sato , MD
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Hidefumi Aoyama , MD, PhD

PURPOSE/AIM
This exhibit aims to:
1. Review the MR findings of primary fallopian tube carcinoma (PFTC) and the clinicopathologic correlation
2. Show the usefulness of diffusion-weighted imaging (DWI), 3D T2-weighted imaging, and 3D dynamic contrast-enhanced (DCE) imaging
3. Identify diagnostic clues for PFTC
CONTENT ORGANIZATION
1. Introduction to PFTC
2. Protocol for pelvic imaging using 1.5-T and 3.0-T MRI
3. Role of MR imaging in evaluating PFTC
4. Review of the clinical course and MR and pathological findings of PFTC
5. Usefulness and pitfalls
SUMMARY
Major teaching points:
1. PFTC is a rare gynecological malignancy, but evidence suggests that the prevalence may be underestimated.
2. An early MR finding in PFTC is a tubal shaped adnexal mass separated from the ovary which is either solid or cystic (hydrosalpinx) with solid mural nodules. In advanced cases, it is difficult to differentiate PFTC from epithelial ovarian carcinoma.
3. MR imaging is an excellent problem-solving modality for evaluating PFTC.
4. DWI, 3D T2-weighted imaging, and 3D DCE imaging improve tumor detection in the early stage, evaluations of lesion characterization, differentiation from other pelvic masses, and determination of clinical staging.
5. Knowledge of current MR techniques and critical imaging findings allows accurate diagnosis of PFTC.

From Common to Complicated: The Range and Appearance of Uterine Leiomyomas

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LL-OBE2250

Jin-Yu Zhang
Elizabeth Lazarus , MD
Ana P Lourenco , MD

PURPOSE/AIM
To demonstrate the imaging findings, complications, and impact on pregnancy of normal and abnormal leiomyomas.
CONTENT ORGANIZATION
Leiomyomas are the most common tumor of the uterus, occurring in 70-80% in women under age 50. Many present with bleeding, pressure, pain, infertility, and as a palpable mass. Leiomyomas are visible on multiple imaging modalities including ultrasound, MR imaging, hysterosonography, CT, and HSG. Leiomyomas may demonstrate cysts, calcification, fat, necrosis, torsion, and rare malignant degeneration which change their appearance. The size and location of leiomyomas and the relationship to the endometrial cavity, cervix, and fallopian tubes determines their impact on fertility and symptomatology. Imaging influences which treatment including hysterectomy, myomectomy, robotic surgery, uterine artery embolization, and medical therapy may be used. Cases demonstrating benign, atypical, and complicated, leiomyomas will be shown on multiple imaging modalities. The role of each modality will be discussed, as well as how to distinguish leiomyomas from other pelvic lesions. Finally, examples of fibroid complications in fertility and pregnancy will be shown.
SUMMARY

Leiomyomas are common lesions in pregnant and non-pregnant women. Their range of appearances and complications will be shown on multiple imaging modalities.

Essure Micro-inserts for Permanent Sterilization: Typical Appearance and Common Complications Demonstrated on Hysterosalpingography

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LL-OBE2251
Elizabeth H Dibble , MD
Elizabeth Lazarus , MD
Ana P Lourenco , MD

PURPOSE/AIM
To demonstrate the HSG appearance of appropriate and inappropriate Essure insert placement and its complications.
CONTENT ORGANIZATION
The Essure micro-insert is an FDA approved safe method of permanent sterilization. Its use is increasing as it is non-invasive and highly effectiven. HSG provides an accurate confirmation of device placement and tubal occlusion. As the device becomes more common, familiarity with the HSG findings indicating successful placement as well as those indicating device complications is important. Appropriate position is confirmed by measuring the distance of the device from the uterine cornua. Tubal occlusion can be assumed if contrast does not pass beyond the distal end of the outer coil of the insert. HSG also demonstrates devices which have not been delivered, punctured the tube, and those that have migrated distally. HSG's demonstrating normal and abnormal positioning of the devices will be shown, as well as those with and without tubal occlusion. The HSG appearance of common device complications will be included.
SUMMARY
Essure mico-insert placement and subsequent tubal occlusion can be assessed on HSG. The increasing usage of this method of sterilization requires radiologists to be aware of the imaging findings indicating successful placement as well as those indicating failure or complication.

Multimodality Imaging of Malignant Mixed MÃ¼llerian Tumors (MMMT) with Emphasis on 3T MR and Diffusion Weighted Imaging

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LL-OBE2252
Joseph J Budovec , MD
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Cesar A Lam , MD
Brandon Palmer , BS
Ryan Scott , BS
Parag P Tolat , MD

PURPOSE/AIM
Uterine sarcomas are rare, accounting for 5-8% of malignant uterine tumors. Uterine sarcomas are fast-growing aggressive cancers with poor prognosis. There are three main subtypes of uterine sarcomas: endometrial stromal sarcomas, leiomyosarcomas, and Malignant Mixed Müllerian Tumors (MMMTs). Differentiating MMMTs from endometrial adenocarcinoma is challenging, as the imaging findings are not always pathognomonic. The purpose of this exhibit is to review the prevalence, epidemiology, pathophysiology, and imaging techniques and findings of MMMTs, with emphasis on dynamic contrast enhanced MR and diffusion weighted imaging.
CONTENT ORGANIZATION
SUMMARY
Malignant mixed müllerian tumors are fast growing, aggressive malignancies with an overall poor prognosis. Imaging plays an important role in the diagnosis and characterization of these uterine sarcomas. Although imaging findings are not pathognomonic, large infiltrative masses with vividly enhancing tissue and restricted diffusion are suggestive of MMMTs.

Pathways of Lymphatic Spread in Gynecologic Malignancies

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LL-OBE2253
Blanca Pano Brufau , MD
Rafael Salvador Izquierdo , MD
Laura Bunesch Villalba , MD
Carmen Sebastia Cerqueda , MD
Carlos Nicolau Molina , MD

PURPOSE/AIM
To recognize the pathways of nodal metastasis that are specific to tumor sites in the cervix, endometrium, ovaries, vagina or vulva. To discuss the optimal imaging technique and classification system for staging of nodal metastases from gynecologic tumors. To describe the information that is essential for accurate classsification of nodal disease and that should be included in the radiologic report.
CONTENT ORGANIZATION
Normal anatomy of the pelvic and paraaortic nodes. Common pathways of nodal spread in gynecological malignancies. Radiologic approach towards metastatic lymph nodes. Staging system.
SUMMARY
Lymph node involvement in gynecologic malignancies is a significant radiologic finding, with important implications for treatment and prognosis. The most likely pathway of nodal spread depends on the tumor location and whether surgery has disrupted normal lymphatic drainage from the tumor site. At present, lymph node involvement is most often assessed with anatomic imaging techniques such as MDCT or MRI. However, the detection of nodal disease with these techniques relies on lymph node size and morphologic characteristics, criteria that provide limited diagnostic specificity. Functional imaging techniques, such as diffusion-weighted MRI and PET, may allow a more accurate nodal assessment based on molecular or physiologic activity.

Role of Imaging in Predicting Outcome of Optimal Surgical Cytoreduction in Ovarian Cancer

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LL-OBE2254
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Christine O Menias , MD
Supreeta Arya , MD
Mark Tann , MD
Marc D Kohli , MD *
Sharmila Roy-Chowdhury , MD

PURPOSE/AIM

1. Discuss the epidemiology, biology, staging and current treatment protocols for ovarian cancer
2. Differentiate resectable from unresectable tumor
3. Describe what specific details that a radiologist needs to mention on a CT prior to surgical cytoreduction.

CONTENT ORGANIZATION

1. Introduction
2. Current chemotherapeutic and surgical management of advanced (stage III/IV) ovarian cancer
3. Staging and pattern of spread, with resectable and nonresectable sites
4. Conclusions

SUMMARY

1. The current use of neoadjuvant cytoreductive chemotherapy has shifted the emphasis of preoperative imaging from the detection of very small metastatic lesions to the detection of bulky disease (> 1 cm) at specific nonresectable or surgically blind sites.
2. Metastases involving the periportal, epiphrenic, and suprarenal lymph nodes, or the gastrosplenic, gastrocolic and splenopancreatic ligaments or the pleural/diaphragmatic surface are unlikely to be optimally resectable.
3. Preoperative imaging may avoid unnecessary extensive surgery in patients who are unlikely to have survival benefit from surgical cytoreduction.

Magnetic Resonance Imaging of Multi-fetal Pregnancies: Current Indications and Future Directions

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LL-OBE2255
Sahar Saleem , MD

PURPOSE/AIM
1. To discuss causes of perinatal morbidity and mortality common in or specific to multi-fetal pregnancies; 2. To review common indications and MRI findings of multi-fetal pregnancies; 3. To discuss current status and explain potential utility of fetal MRI in management of complications of multi-fetal pregnancies
CONTENT ORGANIZATION
-Embryology of multi-fetal pregnancies chorionicity and amnionicity
-Pathogenesis of conditions specific to multi-fetal pregnancies: conjoined twins, twin-to-twin transfusion syndrome (TTTS), and twin reversed arterial perfusion sequence (TRAP).
-Indications and findings of MRI of multifetal pregnancies: 1. One or more twin fetuses have anomalies suspected by ultrasonography; 2. Scanning of a surviving fetus with a dead twin; 3. Specific conditions: TTTS, TRAP, and conjoined twins
-Case presentations
-Current status and future directions of role of fetal MRI in diagnosis and treatment of conditions related to multi-fetal pregnancies
SUMMARY
1. Fetal MRI can help in analyzing multifetal pregnancies referred with Sonographically suspected abnormalities such as shared organs in conjoined twins, placental size in TTTS, and fetal anomalies.
2. With advancement of in-utero therapy and pediatric surgeries, fetal MRI has an increasingly important role in management of pathological conditions related to multifetal pregnancies

Multimodal Imaging of Cesarean Section Delivery Sequela

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LL-OBE2256
Kristin Porter , MD, PhD *
Linda C Chu , MD
Katarzyna J Macura , MD, PhD *

PURPOSE/AIM
Illustrate the spectrum of complications related to Cesarean section delivery (C-section) with MR, ultrasound, and CT imaging.
CONTENT ORGANIZATION
Discussion of the increased risk of complications with repeat C-sections and therapeutic abortions.
Review of imaging findings of C-section changes and complications, including US, CT, and MR, with illustrative examples for ureteral injury, bladder flap hematoma, C-section ectopic, placenta previa, placenta implantation abnormalities, retained products of conception, and endometriosis.
Discussion of distinguishing features of C-section ectopic pregnancy from placenta accreta using imaging and pathological correlation, and review of the management implications.
Demonstration of endometriosis in the abdominal wall following C-section and differentiation from soft tissue tumor, hematoma and abscess.
Discussion of imaging protocols and techniques optimization to address imaging pitfalls.
SUMMARY
Recognizing and accurately diagnosing abnormalities associated with C-section necessitates a command of the normal post-operative appearance, as well as an understanding of the prevalence and spectrum of complications. Radiologists should be comfortable with the multimodality imaging appearance of C-section complications including MR, CT and ultrasound.

Comprehensive Imaging of Adenomyosis: US, MR and Beyond

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LL-OBE2257
Ryan J Smith , MD
Laura Levin , MD
Mindy M Horrow , MD *
Corrado Minimo , MD

PURPOSE/AIM
Most radiologists are familiar with classical findings of adenomyosis on US and MR. This exhibit reviews a variety of subtle, less well known features of adenomyosis on US and MR correlating with a variety of pelvic imaging studies not necessarily performed for this diagnosis.
CONTENT ORGANIZATION
A. Imaging features of adenomyosis 1. Ectopic endometrial glands a. Extension of endometrial glands on US as echogenic lines radiating from endometrium into myometrium b. These “cracks” fill with fluid/air on SIS, contrast on HSG and with increased signal on MR. c. Myometrial cysts can be seen on US, CT and MR 2. Muscular hyperplasia: a. Globular uterus, and thickened junctional zone on US, MR and CT b. Heterogeneity, blurred endometrial border, pencil thin shadows on US 3. Vascularity: Penetrating vascularity of adenomyosis on color and power Doppler and angiography. B. Imaging examples after medical and embolic therapies
SUMMARY
1.Classic findings of adenomyosis on US and MR include a thickened junctional zone and myometrial cysts. 2.Subtle findings of endometrial gland migration can be seen on MR and US using cine clips and color Doppler. 3.Adenomyosis can be appreciated on sonohysterography, hysterosalpingography, CT and catheter angiography. 4.Effects of hormonal and embolic therapies can be seen on imaging studies.

Sonohysterography: A Safe and Low Cost Method for Evaluating Endometrial Pathology

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LL-OBE2258
Bradford T March , MD
Ana P Lourenco , MD
Elizabeth Lazarus , MD

PURPOSE/AIM
To demonstrate the role of sonohysterography in the detection of endometrial pathology.
CONTENT ORGANIZATION
Saline infusion sonohysterography (SIS) is a safe and low cost procedure in which saline is instilled into the uterine cavity to improve endometrial visualization during transvaginal ultrasound. Common indications include abnormal uterine bleeding, pre and postoperative evaluation of uterine myomas, infertility, recurrent spontaneous abortion, and uterine anomalies. SIS can also be used to further evaluate suspected endometrial lesions demonstrated on pelvic ultrasound or hysterosalpingography. Sonographic examples will demonstrate the role of SIS in detecting and classifying endometrial pathology such as polyps, hyperplasia, leiomyomas, malignancies, adhesions, and congenital uterine anomalies. Corresponding imaging, including 3D ultrasound, hysterosalpingography, and MRI will be shown when available, as well as any corresponding hysteroscopy and pathology. Proper technique for SIS will be discussed, including menstrual cycle timing, patient preparation, and the contraindications and complications of the procedure.
SUMMARY
Sonohysterography is a safe, low cost, and accurate method of identifying and diagnosing endometrial pathology. Procedure indications and technique, as well as normal and abnormal findings will be demonstrated and discussed.

Ultrasound-Guided Obstetrical Procedures: What the Radiologist Needs to Know

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LL-OBE2259
Allaf Barra
Martin Chavez
Mariam Moshiri , MD
Rebecca Chang , BS
Jonathan A Flug , MD, MBA
Douglas S Katz , MD
Artemis Petrides , MD
Aleksandr Morim , MD, MBA
Jason C Hoffmann , MD

PURPOSE/AIM
To review and demonstrate examples of ultrasound-guided obstetrical procedures which radiologists should be familiar with.
CONTENT ORGANIZATION
The indications for and literature on the current status of a variety of us-guided obstetrical procedures will be reviewed, and clinical examples will be demonstrated, including better known procedures, as well as procedures which the general and even ultrasound/body imaging specialist may not be familiar

with. Cases from two institutions with busy high-risk obstetrical practices will be reviewed, with input from obstetricians with expertise in performing such procedures. The procedures include: amniocentesis, sampling of chronic villi, amniotic fluid paracentesis, fetal thoracentesis, fetal reduction/fetal cardiac injections for elective abortion (i.e. in multiple gestations, in scar ectopic pregnancy/cervical pregnancy), fetal transfusion (umbilical vein and intracardiac), radiofrequency ablation of the abdominal cord insertion/placental ablation, bipolar cord coagulation (for fetal reduction), and fetal bladder shunting.
SUMMARY
Radiologists are aware of the more routine ultrasound-guided procedures which may be performed during pregnancy, but may not be aware of some more advanced ultrasound-guided procedures which the obstetrician and/or radiologist can perform, which this exhibit will review.

Malignant Uterine Neoplasms: MR Imaging Findings of a Wolf in Sheepskin

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LL-OBE2260

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Luiza D Werneck , MD
Romulo V De Oliveira
Antonio C Coutinho , MD
Leonardo K Bittencourt , MD, MSc

PURPOSE/AIM
Uterine fibroids and adenomyomas are by far the most common focal myometrial lesions in MR imaging examinations. However, there are a number of malignant uterine neoplasms that occur less often and should be well known and recognized accordingly. This exhibit aims to illustrate the MR imaging findings of malignant uterine neoplasms that may help differentiating them from typical benign lesions.
CONTENT ORGANIZATION
- MR Imaging Protocol: Conventional sequences and Dynamic contrast enhancement evaluation. The role of diffusion-weighted imaging. - Typical benign uterine conditions (Fibroids and Adenomyosis) - Malignant Neoplasms of the Uterine Corpus: Uterine Sarcomas (Leiomyosarcomas, Endometrial Sarcomas, Malignant Mixed Müllerian Tumors, Adenosarcoma). - Endometrial Carcinoma. - MR imaging findings that allow distinction between benign and malignant diseases. - Pearls and Pitfalls.
SUMMARY
Typical imaging appearances of fibroids and adenomyomas are already well established, and diagnosis is generally straightforward. Malignant uterine neoplasms are less common, but their imaging appearances may often overlap with those of benign entities. MR imaging findings that allow distinction between benign and malignant diseases include heterogeneity of signal intensity, signs of deep invasion, hemorrhagic necrosis and rapid growth.

Measuring the Unmeasurable: Assessment of Peritoneal Carcinomatosis in Ovarian Cancer

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LL-OBE2261

Miriam Romero , MD
Mittul Gulati , MD
Katherine J Too , MD
Vinay A Duddalwar , MD, FRCR

PURPOSE/AIM
Intraperitoneal dissemination is the most common mode of ovarian cancer spread. Imaging can help plan primary cytoreductive surgery and identify residual and recurrent disease. This exhibit aims to: Review the radiologic assessment of peritoneal carcinomatosis. Define ranking systems to quantify peritoneal disease. Present cases illustrating potential pitfalls in disease evaluation and strategies to overcome them.
CONTENT ORGANIZATION
Describe the importance of imaging in assessing primary disease and surgical planning. Briefly discuss the ranking systems for quantifying peritoneal disease and identify limitations in applying standard RECIST criteria. Illustrate radiological approaches to quantifying peritoneal disease and the potential for post processing CT segmentation to improve accuracy. Present strategies to aid in evaluating postoperative residue, including timing of follow up imaging, role of PET, and targeted biopsy.
SUMMARY
Ovarian cancer is usually diagnosed when widespread intraabdominal disease is present, which is important to evaluate and quantify. Major teaching points include: 1. Definition of ranking systems used to quantify peritoneal disease.
2. Systematic radiologic approach to quantifying peritoneal disease.
3. Potential pitfalls in identifying and measuring peritoneal disease and how to overcome them.

Gestational Trophoblastic Disease after Surgical Procedures: A Spectrum of Diagnostic Clues Based on MR Imaging

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LL-OBE2262

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Leonardo K Bittencourt , MD, MSc
Antonio C Coutinho , MD
Claudia M Miguelote , MD
Natalia Sabaneeff , MD
Romulo Varella , MD

PURPOSE/AIM
The purpose of this study is to describe the MR imaging features in patients with gestational trophoblastic disease (GTD) after surgical procedures like curettage, vacuum-aspiration and less frequently hysterectomy. Our exhibit also aims to illustrate the imaging differences between recurrence of the disease and specific findings of the therapy for GTD.
CONTENT ORGANIZATION
- Findings based on MR imaging to describe the abnormalities related to GTD after surgical procedures. - How can we improve the MR imaging protocol for pelvic examination in these cases? The role of diffusion-weighted MR imaging and dynamics contrast evaluation. - The differences in MR imaging between the recurrence of the disease and findings after surgical procedures.
SUMMARY
Gestational trophoblastic disease is a manifestation of an aberrant fertilization event that leads to a proliferative process and, although usually benign and treatable, GTD occasionally progresses to an agressive process. Because of this reason, we must have to know about the features after surgical procedures of this disease. A recurrence will be a determinant factor in the therapy and in the prognosis.

Conjoined Twins Revisited: Understanding the Evolution of a Unique Reproductive Complication

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LL-OBE2263

Megan Long , MD
Teresita L Angtuaco , MD

PURPOSE/AIM
1. To review the embryology, classification, and sonographic findings of conjoined twins. 2. To illustrate multiple types of conjoined twins using sonographic, radiographic and gross pathologic specimens.
CONTENT ORGANIZATION
1. The overall embryology of twins, both dizygotic and monozygotic will be reviewed. Emphasis will be placed on monozygotic twins and the subset of conjoined twins. 2. The classification and terminology of conjoined twins will be described. 3. The sonographic findings of conjoined twins will be illustrated and correlated with other imaging studies such as radiographs, CT, and MRI. 4. Gross pathologic specimens, where available will be utilized to close the loop in the understanding of this unique set of fetal anomalies.
SUMMARY
Conjoined twinning is rare, occurring in one out of every 50,000-200,000 births. It has a broad spectrum of sonographic presentations which can result in a confusing picture. Knowledge of the embryology, classification, and sonographic findings of conjoined twins is essential to avoid misdiagnosis, determine the likelihood of postnatal viability, and aid in obstetrical management. Correlation with other imaging modalities and gross specimens will enhance the understanding of diagnostic signs that may manifest in the early stages of pregnancy.

Prenatally Detected Cardiac Defects - A Strong Pointer to an Underlying Darker Picture

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LL-OBE2264

Sowmya Mahalingam , MD

Manjiri K Dighe , MD

PURPOSE/AIM
Cardiac anomalies can be isolated, but are often part of a larger picture and hint at underlying aneuploidy or syndromes. The purpose of the poster is to sensitize the viewer to contemplate the possibility of underlying syndromes when any of the specific cardiac defects are encountered.
CONTENT ORGANIZATION
Content organization: A: Schematic diagrams and examples of the sonographic planes of the heart and outflow tracts. B. Schematic diagrams and examples of common congenital cardiac anomalies C: List of syndromes seen with cardiac defects as a major component. For eg, Down's,Ellis van Creveld, Holt Oram, Trisomy 13 and 18, Turner's and Noonan's, Barth Syndrome, Marfan's and Williams Syndrome D: List of the non-syndromic polymalformations with cardiac defects. For eg, CHARGE, VACTERL and POC. E: Description of the syndromes often seen with specific cardiac defects- For eg. Endocardial cushion defect and Down's. G: Examples of the associated sonographic markers of these syndromes.
SUMMARY
Conclusion: The poster should inform and educate the viewer to the prenatally detectable cardiac defects, the syndromes associated with them and the other sonographic markers which are part of the syndromes. As many of these syndromes have prognostic implications, it is vital to recognize them and provide recommendations.

Tales of the Broken Heart: Prenatal Diagnosis of Fetal Cardiac Anomalies with Postnatal Correlation

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LL-OBE2265
Mariam Moshiri , MD
Mark R Ferguson , MD
Puneet Bhargava , MD
Tracy J Robinson , MD
Manjiri K Dighe , MD
Christine O Menias , MD
Theodore J Dubinsky , MD

PURPOSE/AIM
Review imaging parameters to normal fetal heart, features of anomalies with image and related pathologic correlation
Review common and uncommonly encountered fetal cardiac anomalies
Review Clinical approach, need for reimaging, role of radiologist as a member of the team
Review algorithmic approach to arrive at differential diagnosis
CONTENT ORGANIZATION
Review features of normal fetal heart, appropriate imaging planes
Review anomalies: septal defects, Tetralogy of Fallot, transposition of great vessels, double outlet ventricles, hypoplastic heart syndromes, aortic coarctation, pulmonary stenosis, Ebstein anomaly, arrhythmia, cardiomyopathy, cardiac masses, syndromes such as ectopia cordis
Review prenatal imaging features and correlative imaging: 3D US, Cine, MRI, relevant pathologic and surgical photos
Review clinical approach from the time of US diagnosis, need for further imaging, post natal follow up
Describe role of radiologist in management of such pregnancies
Algorithmic approach based on pattern of anomalies to arrive at differential diagnosis
SUMMARY
Major teaching points:
Learn characteristic features of fetal cardiac anomalies on prenatal US
Learn pattern of occurrence and imaging features
Learn clinical approach, role of radiologist in management of pregnancies
Learn algorithmic approach to formulate differential diagnosis

Fetal Abdominal Wall and Associated Gastrointestinal Anomalies: A Diagnostic Guide to the Pre and Post Natal Where, What, and How

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LL-OBE2266
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Sowmya Mahalingam , MD
Ramesh S Iyer , MD
Tracy J Robinson , MD
Joseph R Siebert , PhD
Theodore J Dubinsky , MD
Puneet Bhargava , MD
Christine O Menias , MD
Douglas S Katz , MD

PURPOSE/AIM
Review relatively common and uncommon fetal GI anomalies with associated abdominal/pelvic wall abnormalities Review imaging features of these conditions with image and related pathologic correlation
Review clinical approach, the need for reimaging, and the role of radiologist as a member of the multi-disciplinary team.
Review algorithmic approach to arrive at a differential diagnosis.
CONTENT ORGANIZATION
Review fetal abdominal wall and GI anomalies: gastroschisis, omphalocele, Pentalagy of Cantrell, Prune belly, limb body wall defect, body stalk anomaly, cloacal and bladder extrophy, OEIS, GI atresia and stenosis, anal malformations, associatied syndromes such as Vater association, Sirenomelia, etc.
Demonstrate prenatal imaging features with correlative imaging: 3D US, MRI, and relevant pathologic photos Review clinical approach from time of diagnosis and need for further imaging
Describe role of radiologist in management of such pregnancies
Algorithmic approach based on pattern of anomalies to arrive at a differential diagnosis
SUMMARY

Learn characteristic features of fetal abdominal wall and GI anomalies on prenatal US
Learn pattern of occurrence and imaging features on US, and MRI.
Learn about clinical approach and ole of radiologist in management of such pregnancies
Learn algorithmic approach to formulate a differential diagnosis

MR Staging of Endometrial Carcinoma with Co-existing Uterine Adenomyosis: What the Radiologist Should Know?

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LL-OBE2267
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Evis Sala , MD, PhD
Shaza S Al Sharif , MD
Himanshu Pandey , MBBS, DMRD
Hisham W Mikhael , MD, MSc
Caroline Reinhold , MD, MSc

PURPOSE/AIM
To describe the MR imaging pearls and pitfalls of staging endometrial carcinoma in patients with co-existing adenomyosis
CONTENT ORGANIZATION
Endometrial carcinoma frequently coexists with uterine adenomyosis. Manifestations of adenomyosis on T2W images include linear striations of high signal intensity radiating out from the endometrium, heterogeneous signal intensity of a hypertrophic myometrium with small hyperintense foci, and an irregular endomyometrial junction. These findings make it difficult to determine the margin of endometrial carcinoma and thus lead to staging errors. Indeed, it is often challenging to distinguish these benign findings from true invasion of an endometrial malignancy into the myometrium. In this exhibit, we will: 1)Briefly describe the MR pattern of adenomyosis and endometrial carcinoma with special emphasis on diffusion-weighted imaging (DWI). 2)Illustrate cases of uterine adenomyosis mimicking endometrial carcinoma. 3)Review pathologic proven cases of endometrial carcinoma co-existing with adenomyosis and describe the MR imaging pearls and pitfalls of staging this special entity. The added value of DWI in this setting will be presented.
SUMMARY
Pearls and pitfalls of MR staging endometrial carcinoma with co-existing adenomyosis displayed through an extensive pictorial review with special emphasis on the added value of DWI.

Female Pelvic Masses with Adipose Tissue; Spectrum of Disease and Radiologic-pathologic Correlation

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LL-OBE2268

Masayo Ogawa
Junko Takahama , MD
Yoshiko Yoshimura
Tetsuya Masada
Aki Takahashi , MD
Kiyosei Yamamoto , MD
Nagaaki Marugami
Takahiro Itoh , MD
Kimihiko Kichikawa , MD

PURPOSE/AIM
1. To illustrate the spectrum of female pelvic masses with adipose tissue.
2. To correlate MR and CT images with histopathological features.
CONTENT ORGANIZATION
SUMMARY
1. Optimizing MR techniques can facilitate the detection of adipose tissue.
2. Detection of adipose tissue in female pelvic masses is the key characteristic radiologic finding reflecting the pathological features.

Recent Advances in MR Imaging for Evaluating Fallopian Tube Diseases

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LL-OBE2269

Mina O Asatani , MD, PhD
Akiko Sato , MD
Norihiko Yoshimura , MD, PhD
Hidefumi Aoyama , MD, PhD

PURPOSE/AIM
This exhibit aims to:
1. Review the MR findings of diseases affecting the fallopian tubes
2. Understand the usefulness of diffusion-weighted imaging (DWI), 3D T2-weighted imaging, and 3D dynamic contrast-enhanced (DCE) imaging
3. Identify diagnostic clues for a variety of fallopian tube diseases
CONTENT ORGANIZATION
1. Presented cases: hydrosalpinx, pelvic inflammatory disease, endometriosis, tubal torsion, ectopic pregnancy, hydatid cyst of Morgagni, and primary fallopian tube carcinoma
2. Protocol for imaging the female pelvis using 1.5-T and 3.0-T MRI
3. Role of MR imaging in evaluating fallopian tube diseases
4. Review of clinical courses and MR findings of fallopian tube diseases
5. Usefulness and pitfalls
SUMMARY
Major teaching points:
1. Although the increasing use of imaging provides valuable information on various conditions affecting the fallopian tubes, it is sometimes difficult to make a diagnosis with conventional images.
2. MR imaging is an excellent problem-solving modality for evaluating fallopian tube diseases.
3. DWI, 3D T2-weighted imaging, and 3D DCE imaging can reveal the anatomical location and characterization of lesions, allowing reliable diagnosis.
4. Knowledge of current MR techniques and critical imaging findings of a variety of diseases affecting the fallopian tubes will improve diagnostic accuracy.

PET-CT of Gynecologic Cancers: Pearls and Pitfalls

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LL-OBE2270

Hima Prabhakar , MD
Jessica J Kraeft , MD
Susanna I Lee , MD,PhD

PURPOSE/AIM
1. Review image acquisition and interpretation protocols to optimize accuracy
2. Distinguish normal from abnormal tracer uptake in the female pelvis
3. Define findings that impact on treatment planning or prognosis
CONTENT ORGANIZATION
Examples of cervical, high-risk endometrial and uterine cancer patients imaged for primary treatment or suspected recurrence is presented. Cases are chosen to illustrate how anatomically precise tracer localization, lower resolution limit of PET, and extent of background tracer are important factors in exam performance. How findings are used to tailor surgery, radio- and chemotherapy are reviewed.
SUMMARY
1. Attention to the CT image quality, minimizing background tracer signal in the ureters, bladder and bowel and evaluation of the fusion images are necessary for accurate detection of deep pelvic tumor, lymphadenopathy and carcinomatosis.
2. Menstrual status and prior treatment affect physiologic FDG distribution in the uterus and ovaries.
3. Lymphadenopathy, thoracic or bony metastases, and residual and/or recurrent tumor are key findings driving subsequent therapy and prognosis

MRI of the Vagina Vulva, and Female Urethra with 3D MR images @ 3T: Technique, Indications, and Imaging Findings

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LL-OBE2271

Junko Takahama , MD
Aki Takahashi , MD
Nagaaki Marugami
Takahiro Itoh , MD
Kimihiko Kichikawa , MD

PURPOSE/AIM
MR imaging can visualize various pathology involving the vagina, vulva and urethra. We show the advantage of the isovoxel three-dimensional sequences of T2- and fat-saturated dynamic contrast T1 weighted images to assess the anatomy and various pathologies.
CONTENT ORGANIZATION
1. Technical Challenges and Improvements: When the vagina is thin and bent, image interpretation is challenging. Proper reformatting image is essential. Use of 3D images with 3T system can improve image quality. 2. Indications: MR imaging can be used for evaluating abnormalities including congenital anomalies, diverticulum, cysts and neoplasms. 3. Clinical Imaging Findings: MR imaging findings of the various vagina, vulva and urethra pathologies especially focused on the latest cancer staging will be presented.
SUMMARY
MR imaging is an excellent modality for evaluating the vagina, vulva and urethra pathology. Proper reformatting image of isovoxel three-dimensional sequences are essential for good quality imaging.

Can We do Better in Differentiating Benign Pelvic Peritoneal Inclusion Cysts from Malignant Ovarian Neoplasms-Over a Decade Experience from a Cancer Center

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LL-OBE2272

Svetlana Mironov , MD

PURPOSE/AIM
Over a decade experience in tertiary Cancer Center raised a concern that even experienced radiologists are not comfortable in differentiating benign peritoneal inclusion cysts (PICs) in female patients from malignant adnexal masses. PICs can mimic ovarian neoplasms and result in multiple follow up exams, surgeries and contribute to increased health care cost. Uncertainty with diagnosis contributes to patient's anxiety and discomfort. The purpose of the exhibit is to educate

radiologists about this important benign pathology that can mimic malignancy.
CONTENT ORGANIZATION
-Discuss etiology and pathophysiology of PICs, clinical presentations, differential diagnosis and management -Describe distinct imaging characteristics of PICs on US, CT and MRI -Provide sample cases of PICs and malignant masses -Discuss mimics and overlaps
SUMMARY
The major teaching points are the following: - PICs appear as irregular shape loculated fluid collections along the pelvic sidewalls on all cross-sectional modalities -centrally or eccentrically located ovary must be identified -PICS show waxing and waning appearance with change in size on follow up exams -thick, vascular and enhancing on CT and MRI septations with entrapment of the ovary within the fluid collection are common (spider-web appearance) and should not confuse PICs with malignant neoplasms

Congenital Diaphragmatic Hernia: Review of Embryology, Imaging and Management

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LL-OBE2273

Obadiah Elkins , MD
Sowmya Mahalingam , MD
Manjiri K Dighe , MD

PURPOSE/AIM
Congenital diaphragmatic hernia (CDH) affects approximately one in every 4000 live births. Numerous advances in have been made leading to improved survival. These include the identification of prenatal predictors of perinatal morbidity and mortality; the addition of new therapies and changes in neonatal care strategies. In this poster, we briefly describe the embryology, classification, imaging evaluation, associated malformations and syndromes, complications, impact on management, and future directions.
CONTENT ORGANIZATION
1. Discuss the embryology and anatomy of the diaphragm and the origin of diaphragmatic hernias.
2. Review the imaging appearance of CDH on ultrasound and MRI.
3. Discuss issues related to the type of CDH on the basis of which organs are involved and the effect of the hernia contents on adjacent structures, evaluation and exclusion of complications and associated malformations, calculation of lung volume and liver herniation measurements 4. Correlate with postnatal imaging appearance including radiographs and CT.
5. Management of CDH with emphasis on surgical repair, pulmonary function and respiratory management.
6. Future directions.
SUMMARY
Imaging plays a vital role in the evaluation and management of CDH which is important for prenatal counseling and perinatal planning.

Pre and Perinatal Appearance of Intra and Periventricular Hemorrhage

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LL-OBE2274

Obadiah Elkins , MD
Sowmya Mahalingam , MD
Manjiri K Dighe , MD

PURPOSE/AIM
Intraventricular and periventricular hemorrhage (IVH-PVH) is commonly seen in premature babies. Pathogenesis of IVH-PVH is multifactorial with participation of intravascular, vascular and extravascular factors. Detection of IVH-PVH and its neuro-pathologic consequences has been facilitated greatly by ultrasonography, MRI and CT. Accurate diagnosis of IVH-PVH is necessary for management. This poster will outline the etiology, neuro-pathology, imaging and complications of IVH-PVH.
CONTENT ORGANIZATION
1. Review the neuropathology of IVH-PVH with review of the consequences including germinal matrix destruction, post-hemorrhagic hydrocephalus, and periventricular hemorrhagic infarction.
2. Etiology of IVH-PVH in pre and perinatal period for example tumor, infection, ischemia, neonatal alloimmune thrombocytopenia, trauma, Maternal ITP, HELLP and drugs.
3. Imaging features of IVH-PVH on US, MR and CT in both pre and perinatal period including posterior fossa hemorrhage.
4. Complications of IVH-PVH including periventricular leukomalacia, obstructive hydrocephalus and pontine neuronal necrosis.
5. Review of the prenatal and postnatal management of IVH-PVH
SUMMARY
IVH-PVH can be seen in both the pre and perinatal period and can have devastating consequences. This has prognostic implications and needs to be managed aggressively to prevent further cerebral damage.

High Resolution MRI for Localized Regional (Vaginal) Recurrence of Endometrial Cancer after Hysterectomy; Imaging Protocols and Impact on Radiation Therapy

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LL-OBE2275

Qiqing Ge , MD
Seth A Kaufman , MD
Dustin Nguyen , DO
Sara E Smolinski , MD
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Dmitry Rakita , MD *

PURPOSE/AIM
To illustrate the role of high resolution MRI in the evaluation of recurrent endometrial malignancy in the vagina as well as discuss impact of imaging findings on regional radiation therapy options.
CONTENT ORGANIZATION
1. Background information about patterns of endometrial cancer recurrence: 30-50% recur locally in the vagina. 2. MRI protocols: Use of a plastic vaginal dilator cylinder; multiplanar, multisequence noncontrast and dynamic contrast enhanced imaging, including DWI for detection and characterization of small tumors. 3. Impact of MRI findings on high-dose-rate regional radiation protocols. Intracavitary brachytherapy for nonbulky vaginal disease with maximal tumor thickness of < 5 mm on imaging VERSUS interstitial brachytherapy for maximal tumor thickness > 5 mm. 4. Postradiation followup MRI for evaluating treatment response.
SUMMARY
MRI is a powerful tool for detecting and characterizing endometrial cancer recurrence in the vagina after hysterectomy. Relevant findings help radiation oncologists in choosing the appropriate radiation treatment plan. Use of an optimal high resolution pelvic imaging protocol, including a plastic vaginal dilator cylinder, dynamic contrast-enhanced and diffusion weighted sequences improves detection and characterization.

Uncommon Implantation Sites of Ectopic Pregnancies: Thinking Beyond the Complex Adnexal Mass

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LL-OBE2276

Anjeza Chukus , MD
Maowen Hu , MD, PhD
Nikki Tirada , MD
Cuong Nguyen , DO
Vinay K Bhatia , MD
Neelima I Reddy , MD

PURPOSE/AIM
By the end of this exhibit, the reader will be able to:

- Discuss the unusual implantation sites of ectopic pregnancies (EPs).
- Use sonographic signs to render an appropriate diagnosis.

CONTENT ORGANIZATION
EPs are the leading cause of first trimester maternal death. Rare types of EPs pose an immense diagnostic challenge to the clinician with disastrous consequences, if not treated in a timely fashion. Through cases from our institution and review of the literature, we will illustrate sonographic diagnostic clues to help radiologists accurately make a diagnosis. Examples include: echogenic interstitial line or bulging of the myometrial mantle (interstitial ectopic), hourglass configuration of the uterus and lower uterine segment with surrounding trophoblastic flow and absence of sliding sign (cervical ectopic), intraovarian hyperechoic ring with peritrophoblastic flow (ovarian ectopic), thinning of the myometrium and sac in the anterior uterine segment (scar pregnancy), two adnexal heartbeats/gestational sacs (twin ectopic), intra- and extrauterine gestational sac (heterotopic), hematosalpinx and hemoperitoneum (ruptured ectopic).

SUMMARY
In everyday practice, there is a tendency to overlook the possibility of the unusual implantation sites of EPs. Awareness of specific imaging features is crucial for correct diagnosis and management.

Complex Abdominal Wall Defects: Multimodality Fetal Imaging with Autopsy and Postnatal Confirmation

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LL-OBE2277

Reza Pakdaman , MD
Anne M Kennedy , MD
Mark Molitor , MD
Paula J Woodward , MD *

PURPOSE/AIM
1: Review embryology.
2: Demonstrate spectrum of findings in complex abdominal wall defects (AWD)
a) Bladder exstrophy
b) Cloacal exstrophy
c) Body stalk anomaly
d) Abdominoschisis
3: Provide algorithm for evaluation of abdominal wall defects beyond gastroschisis and omphalocele.
4: Correlate fetal imaging with autopsy/neonatal findings.
CONTENT ORGANIZATION
1: Explain embryology as a basis for understanding AWDs 2: Illustrate spectrum of imaging findings in fetuses with complex AWDs
a) Position of cord insertion site and evaluation of umbilical cord
b) Bladder vs.pelvic mass?
c) Genitalia: normal or not?
d) Normal anal dimple, anal atresia, vesicocolic fistula.
e) Spinal cord abnormalities: tethered cord, lipoma, lipomyelomeningocele
f) Vertebral segmentation anomalies
g) Renal abnormalities: pelvic kidney, crossed fused ectopia 3: Correlate with surgical or postnatal findings
SUMMARY
The major teaching points of this exhibit are:
1: Develop a search pattern to ensure detection of rare, complex AWDs. Correct diagnosis has significant impact on pregnancy management.
2. Comprehension of the full spectrum of findings requires knowledge of embryology.
3: Multiple imaging planes and techniques are required for complete fetal evaluation.
4: Fetal MRI is useful to confirm sonographic suspicion for bladder and cloacal exstrophy.

Diffusion-weighted MR Imaging of Gynaecological Disorders

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LL-OBE2278

Megha Sanghvi , MD
Hemant T Patel , MD
Ankur Shah , MD
Mrunali l Shah , MBBS
Nishat Goyal , MBBS, DMRD

PURPOSE/AIM
1. To introduce the optimal b-value in diffusion-weighted MR imaging (DWI) to evaluate the female pelvic lesions.
2. To illustrate the usefulness of DWI and apparent diffusion coefficients (ADC) measurement to evaluate various disease in female pelvis.
CONTENT ORGANIZATION
1. MRI protocols of pelvic MRI especially DWI
2. Discussion of various parameter including free breathing, breath-hold, single-shot, multi-shot, various b-factors (0, 200, 400, 600, 800, 1000 s/mm2)
3. DWI imaging of various female pelvic lesions; uterine and ovarian lesions
4. Limitation of DWI
SUMMARY
The major teaching points of this exhibit are:
1. Understadning of proper protocols is mandatory for obtaining good image quality of pelvic DWI
2. DWI may be adding up information for evaluating the various pelvic lesions in female and helps to achive precise diagnosis.

MRI in Intracavitary Brachytherapy of the Cervical Cancer: What Radiologists Need to Know

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LL-OBE2279

Gaiane M Rauch , MD, PhD
Leonardo P Marcal , MD
Katherine O Castle , MD
Ann Klopp , MD, PhD

PURPOSE/AIM
The purpose of this exhibit is to present a new MRI protocol for imaging of intracavitary brachytherapy probes and its use for radiation treatment planning, review the MRI compatible brachytherapy devices and their acceptable positioning, and discuss structured reporting format of imaging findings.
CONTENT ORGANIZATION

1. Review a new MRI protocol utilizing T2 3D series for imaging of the brachytherapy device, evaluation of adequate placement of the brachytherapy probe, assessment of residual tumor burden, and its use for radiation therapy planning.
2. Review existing MRI compatible brachytherapy devices for cervical cancer treatment and discuss their application depending on the tumor burden.
3. Discuss appropriate reporting of the imaging findings and propose a structured report format.
SUMMARY
New MRI protocol utilizing T2 3D series for imaging of patients with intracavitary brachytherapy devices decreases imaging time, provides high quality diagnostic images for radiologic interpretation and helps to improve radiation therapy planning.

A Portrait of the Placenta: Development, Anatomy, Imaging and a Potpourri of Pathology

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LL-OBE2280

Zaihleen S Keller , MD
Kristina E Hoque , MD, PhD
Ashley E Prosper , MD
Jody Hemingway
Daphne K Walker , MD

PURPOSE/AIM
1. Discuss placenta development and anatomy in singleton and twin gestations 2. Present non-pathologic and pathologic conditions of the placenta and review cases from LAC-USC Medical Center 3. Discuss US imaging findings, US imaging pearls, and adjunct MRI 4. Review fetal risk and clinical management
CONTENT ORGANIZATION
1. Placenta development and anatomy in singleton and twin gestations 2. Placenta size, shape, and trophotropism (circumvallate placenta, succenturiate lobe, placenta previa) 3. Placental calcifications, focal cystic/hypoechoic lesions, bleeding (subchorionic hemorrhage,abruption), and vascular abnormalities (vasa previa, infarction) 4. Placenta accreta, US imaging pearls and adjunct MRI 5. Primary placental tumors (GTD,chorioangiomas) 6. Placental pathology of monochorionic twin gestations and in utero interventions 7. Review fetal risk, emergent and non-emergent clinical management of select conditions
SUMMARY
Although the placenta is the primary support for the fetus throughout gestation, its evaluation is often cursory during imaging examinations. Our goal is to increase knowledge and awareness of the placenta and to develop a directed approach to imaging of its pathologic states. The identification of placental abnormalities by the radiologist is often critical in the assessment and management of the developing fetus.

Interstitial Ectopic versus Cornual or Angular Pregnancy? An Approach to Imaging

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LL-OBE2281
Ashley E Prosper , MD
Kristina E Hoque , MD, PhD
Joanne Hemmingway
Daphne K Walker , MD

PURPOSE/AIM

- Review anatomy at the junction of the uterus and fallopian tube
- Discuss the diagnostic dilemma of pregnancies in this region and clarify the terms: interstitial ectopic, cornual and angular pregnancy
- Discuss management and outcomes
- Present an algorithmic approach for evaluating these pregnancies

CONTENT ORGANIZATION

1. Schematic review of anatomy at the junction of the uterus and fallopian tube
2. Clarification of the terms: interstitial ectopic, cornual and angular pregnancy
3. Case examples from LAC-USC Medical Center, including mimics
4. Ultrasound imaging pearls and adjunct 3D US and MRI imaging
5. Management, including the radiologist's role, and case outcomes
6. Algorithm for evaluating pregnancies in this region

SUMMARY
Pregnancies in the region of the junction of the uterus and fallopian tube are often diagnostic challenges. Life threatening interstitial ectopic pregnancies must be identified and distinguished from pregnancies with potential to progress to term. The goal of this exhibit is to improve diagnostic accuracy of these cases by: 1. Reviewing the anatomy at the junction of the uterus and fallopian tube 2. Clarifying terms used to describe pregnancies in this region 3. Reviewing imaging findings, cases, mimics, and management 4. Developing an imaging algorithm for evaluation of pregnancies in this region.

Non-epithelial Ovarian Neoplasms - Imaging Spectrum with Radiologic-Pathologic Correlation

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LL-OBE2282
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Eric P Tamm , MD
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Harshad S Ladha , MBBS
Chintan P Shah , BS
Revathy B Iyer , MD

PURPOSE/AIM
1. To review the epidemiology, classification, molecular biology, pathology and natural history of non-epithelial ovarian cancer 2. To illustrate the role of imaging in the management of patients with non-epithelial ovarian cancer 3. To discuss implications for management and prognosis
CONTENT ORGANIZATION
- Epidemiology, classification, molecular biology, pathology including immunohistochemistry, clinical presentation, natural history
- Multimodality imaging spectrum of various types of non-epithelial ovarian cancer with radiologic-pathologic correlation
- Management and prognosis
SUMMARY
Non-epithelial ovarian tumors account for 10% of ovarian neoplasms. These are broadly classified into germ cell tumors and sex-cord stromal tumors and steroid tumors. Germ cell tumors (dysgerminoma, yolk sac tumors, embryonal carcinoma, mature and immature teratoma) are typically seen in the first two decades of lfe, whereas sex cord-stromal (adult granulosa cell tumor, Sertoli-Leydig cell tumors, fibroma, thecoma, other ovarian stromal tumors) and steroid cell tumors are more common in adult women. Radiological appearances of these tumors are varied and often overlap. Awareness of the spectrum of non-epithelial ovarian tumors and familiarity with their clinical and imaging features may help in early identification and guide appropriate management

How to Deal with a Club Foot Diagnosed in Utero?

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LL-OBE2283
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Andree Grignon , MD
Chantale Lapierre , MD
Josee Dubois , MD
Marie-Claude Miron , MD, FRCPC
Laurent A Garel , MD
Guy Grimard , MD,FRCSC

PURPOSE/AIM
Club foot is one of the most frequent limb anomalies prenatally detected, with significant false positive and false negative rates. The prognosis of the malformation is related to its etiology and to coexistence of other anomalies. In utero, club foot is usually diagnosed when the plantar sole is in the same plane as the coronal view of the tibia and fibula. Yet, any foot/ankle misalignement in utero is not synonymous with club foot. The aims of the exhibit are: - To review the diagnostic criteria of club foot; - To discuss the prognosis, the differential diagnosis, the necessary work-up; and - To suggest a practical algorithm.
CONTENT ORGANIZATION
To review the criteria of normality.
To illustrate the appearance of club foot in utero and the main differential diagnosis (normal variants, rockerbottom foot and more complex malformations).
To demonstrate the mandatory work-up by illustration of various situations: fibular and tibial hemimelia, congenital pseudarthrosis, congenital postero medial tibial bowing, femoral hypoplasia, Gallop-Wolfgang complex, split hand/foot long bone syndrome.
SUMMARY
Each fetal ankle misalignement implies a complete fetal work-up including detailed fetal ultrasound, genetic and orthopedic counseling. Postnatal management will depend on associated anomalies.

Role of MRI and PET CT Prior to Pelvic Exenteration for Recurrent Gynecologic Malignancies: A Pictorial Review

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LL-OBE2284
Maura Micco
Elizabeth J Sutton , MD
Olivio Donati , MD
Hebert Alberto Vargas , MD
Dennis Chi , MD
Evis Sala , MD, PhD
Vaagn Andikyan
Lizza Lebron , MD

PURPOSE/AIM
1- Review indications for pelvic exenteration (PE) in recurrent gynecologic malignancies
2- Illustrate the role of MRI and PET CT for recurrent gynecologic malignancies prior to PE
3- Illustrate potential pitfalls in the interpretation of recurrent gynecologic malignancies.
CONTENT ORGANIZATION
Focus will be on indications and contraindications for PE in recurrent gynecologic malignancies. Review will include different types of en-bloc resections; advances in surgical technique; complications and outcome. We will detail how MRI and PET CT contribute towards the diagnosis of local recurrence, screen for distant metastases and provide a surgical road map. MRI protocol will be detailed including the use DWI/ADC and dynamic multiphase contrast enhanced imaging. Pre-operative imaging will be correlated with post-surgical imaging and histopathology. Potential pitfalls in the interpretation will be illustrated.
SUMMARY
MR and PET CT imaging of recurrent gynecologic malignancies can define local recurrence and size; bladder, vagina and/or colorectal invasion; pelvic sidewall invasion; external iliac involvement and distant metastases. Imaging defines eligibility and type of PE. Pitfalls include changes due to chemotherapy, surgery and radiation. Viewer will learn to interpret these studies and define the surgical roadmap. Future role of PET MRI will be addressed.

PET-CT in Ovarian Cancer Evaluation: The Developing Role in Patient Management

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LL-OBE2285

Alice M Munari
Andrea G Rockall , MRCP, FRCR *
Giovanni G Pompili , MD
Richard K. J. Brown , MD *

PURPOSE/AIM
To review the emerging role of FDG PET/CT in the diagnosis, staging, re-staging and therapy response monitoring of ovarian cancer (OC). We highlight the potential advantages in terms of accuracy and prognostic value as well as in terms of change of management, in comparison with standard imaging (CT and MRI).
CONTENT ORGANIZATION
Review of current standard imaging techniques and their limitations. Present and illustrate: 1. The diagnostic performance of FDG PET/CT in newly diagnosed and recurrent OC. 2. The prediction of prognosis and role in response assessment 3. Comparison of FDG PET/CT to other new techniques (diffusion weighted MRI (DWI) and dynamic contrast-enhanced (DCE)-MRI) Discuss future research including new tracers (11C-Choline, FEC, FES,18F-FLT) and new applications (guided biopsy, PET/MRI).
SUMMARY
PET/CT imaging has a potential role in OC patient's surveillance, treatment planning, predicting survival, and may represent a non-invasive biomarker in assessing therapy response. In the future, tracers other than FDG, such as FES and radiolabelled Choline, may be able to provide an improved non-invasive imaging tool and treatment response biomarker, allowing a patient centered therapy.

Initial Clinical Experience with Maternal/Fetal Magnetic Resonance Imaging at 3T

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LL-OBE2286

James Stepenosky , MD
Christine E McDonald , MD
Victoria Campbell
Ryan Rockhill , MD
Danielle A Taysom , MD
Robert M Marks , MD

PURPOSE/AIM

1. Review our initial clinical experience with maternal/fetal MR imaging at 3T.

CONTENT ORGANIZATION

1. Protocol development is reviewed at 3T strength. Indications and utility of standard sequences are reviewed, as well as basic exam procedures and tailoring of the exam to answer the clinical question.
2. Review the practical implications of the differences between 1.5T and 3T imaging, specifically of SAR and B1 inhomogeneity and mitigation of these factors.
3. Review MR artifacts and discuss how increased field strength at 3T impacts them. Discuss artifact and artifact mitigation most relevant to maternal/fetal imaging.
4. Pictorial review of multiple 3T maternal/fetal cases including acute appendicitis, placenta accreta, MCDK, CPAM/sequestration, CDH, lung volumetry, myelomeningocele, multiple gestations with asymmetric growth and a case of micrognathia prior to EXIT procedure. Comparison will be made to similar cases at 1.5T.

SUMMARY
High quality diagnostic MR in the pregnant patient is possible at 3T although technical challenges remain.
The thrust of this exhibit is to:
1. Detail imaging protocols, artifacts, scan advantages and limitations in maternal/fetal imaging at 3T.
2. Review common maternal/fetal cases at 3T and show its potential advantage over imaging at 1.5T.

MRI Evaluation of Pelvic Floor Dysfunction

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LL-OBE2287

Laura E Rueff , MD
Steven S Raman , MD

PURPOSE/AIM
This presentation aims to review the use of dynamic MRI and MR defecography in the evaluation of pelvic floor dysfunction, including pelvic floor relaxation and organ prolapse. Anatomic appearances and pathologic grading as it relates to precise diagnosis and facilitation of appropriate management will be presented.
CONTENT ORGANIZATION
1. Review pelvic floor anatomy as seen at MRI. 2. Present techniques of dynamic pelvic MRI and MR defecography. 3. Illustrate the algorithm for evaluation of the pelvic floor with MRI using the HMO system. 4. Present pelvic floor dysfunction pathologic entities using original cases for illustration of imaging appearance and grading. o Pelvic Floor Relaxation o Urethral Hypermobility o Cystocele o Vaginal Prolapse o Uterine Prolapse o Rectocele o Enterocele, Cecocele, Sigmoidocele, and Peritoneocele o Descending Perineum Syndrome o Anorectal Dysfunction
SUMMARY
This presentation reviews the use of dynamic MRI and MR defecography in the evaluation of pelvic floor dysfunction using original cases to demonstrate typical imaging appearances and grading technique. The viewer will: 1. Review the anatomy of the pelvic floor as seen on MR imaging 2. Learn the HMO method of grading pelvic floor dysfunction 3. View the imaging appearance of the spectrum of pelvic floor dysfunction pathologies

Pitfalls in HSG and Virtual-HSG: How to Avoid Them?

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LL-OBE2288

Javier Vallejos , MD
Patricia M Carrascosa , MD *
Carlos Capunay , MD
Silvia Barbeito , MD
Ana Carla L Vasconcelos , MD
Jimena B Carpio , MD
Ezequiel Salas , MD

PURPOSE/AIM
• To emphasize the proper technique of HSG and V-HSG
• To describe the appearances of technical artifacts, normal variants, and findings simulating pathology
• To illustrate the more frequent pitfalls
CONTENT ORGANIZATION
o HSG and V-HSG technique: focus on how we do procedure o Normal anatomy of the uterus and fallopian tubes o Frequent findings:
• False positives:
- Pseudo-polyps
- Tubal pseudo-occlusion
- Other non-pathological findings: linear cornual lucencies, C-scars, mucus secretions
• False negatives:
- Suboptimal cavity distension
- Intramural pathology
SUMMARY
Conventional HSG and Virtual HSG has demonstrated similar sensitivity and specificity results. However, there are a number of false interpretations that may affect the general validity of this method. Therefore it is important to know the correct technique and assessment of these findings.

Multimodality Imaging of the Postpartum/Posttermination Uterus: Evaluation Utilizing Ultrasound, Computed Tomography, and Magnetic Resonance Imaging

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LL-OBE2289

Sherelle L Laifer-Narin , MD
Hyonah Kim , MD
Elizabeth M Hecht , MD
Jeffrey H Newhouse , MD

PURPOSE/AIM
The purpose of this exhibit is to review common and uncommon complications and imaging findings of postpartum and posttermination patients. Knowledge of normal findings, abnormal findings, and complications are essential for accurate diagnosis and management of these patients. Ultrasound, CT, MR, and angiographic findings will be presented.
CONTENT ORGANIZATION
Postpartum/postermination complications include hemorrhage, infection, entities secondary to cesarean delivery, or miscellaneous. Causes of postpartum hemorrhage include retained products of conception, retained placenta accreta, arteriovenous malformation, or pseudoaneurysm. Infectious entities include endometritis and pelvic septic thrombophlebitis. Post cesarean complications include hemorrhage, abscess, uterine dehiscence, and c-scar endometriosis. Miscellaneous entities include DVT and pulmonary embolus.
SUMMARY
Postpartum complications are a common cause of morbidity and mortality in women of reproductive age. Imaging is essential for diagnosis and radiologists must be familiar and aware of these entities so that accurate treatment and management is obtained. The reader will be familiarized with imaging findings of postpartum complications, and management pathways will be discussed.

Pitfalls and Mimics in the Staging of Endometrial Carcinoma with MRI and Pathologic Correlation. All Cases Were Misinterpreted in the Radiologic Report

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LL-OBE2290

Alfonso Iglesias , MD, PhD
Mercedes Arias
Beatriz B Nieto , MD
Marta Herreros , MD
Laura Juaneda Magdalena Benavides
Magdalena Porto Quintans

PURPOSE/AIM
The purpose of exhibit is to expose the radiologist to a series of cases with pathological and MRI correlation of atypical presentations of endometrial carcinoma (EC) pitfalls and disease mimics which were misdiagnosis in the radiologic reports for staging of endometrial carcinoma (EC)
To learn the important MR imaging findings that can be overlooked or misinterpreted
CONTENT ORGANIZATION
To review the best MRI protocol in the staging of EC
To analyze the possible causes of misdiagnosis in the assessment of EC with pathologic and MRI correlation
To discuss the key MR imaging features which help to make correct extent of disease
SUMMARY
MR imaging is accurate in delineating local disease extent of EC, thus it is important for a radiologist to know the spectrum of atypical presentations, potential pitfalls and disease mimics, because despite these challenges may aid in the accurate diagnosis

The Missing Strings: Multimodality Imaging and Management of Mislocated Intrauterine Contraceptive Devices

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LL-OBE2291

Ayman H Gaballah , MD, FRCR
Jessica R Leschied , MBBCh
Ehab H Youssef , MD, FRCR
William J Weadock , MD *

PURPOSE/AIM
Review different types of the commonly used intrauterine contraceptive devices (IUDs)
Describe the range of imaging findings in a normally and abnormally positioned IUDs
Discuss the risks, complications, and management options in cases of malpositioned IUDs
CONTENT ORGANIZATION
Introduction
Illustration of different types of IUDs
Diagnostic imaging findings– Multimodality imaging appearance of normally and abnormally positioned IUDs will be reviewed using a case-based method
Complications and clinical considerations of malpositioned IUDs
Conclusion and take home points
SUMMARY
IUDs are the most frequently employed method of reversible contraception worldwide. Imaging of IUD placement plays a valuable role in assessing the correct position of the IUD, as well as, in evaluating for any associated complications. Ultrasound is the most commonly used imaging method for evaluating correct placement. If the IUD is not visualized on ultrasound, a plain radiograph of the pelvis is performed to evaluate for extrauterine migration. CT and MRI may be performed in complicated cases. Radiologists must be familiar with the appearance and desired position of the IUD on multiple imaging modalities, as well as, have knowledge of the associated complications. including extrauterine migration, fragmentation, downward displacement, and associated infection.

Tips to Avoid Misinterpretation of Diffusion-weighted Images for Differentiation of Benign and Malignant Ovarian Lesions

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LL-OBE2292

Hyun Sil Lee
Sung Eun Rha , MD
Soon Nam Oh , MD
Jae Young Byun , MD

PURPOSE/AIM
To demonstrate tips and tricks of diffusion-weighted imaging (DWI) in differentiation of benign and malignant lesions in patients with complex solid and cystic or predominantly solid ovarian masses
CONTENT ORGANIZATION
1. Typical imaging findings of malignant ovarian tumors showing diffusion restriction and benign ovarian tumors without diffusion restriction on DWI 2. Benign ovarian tumors showing diffusion restriction, mimicking malignant tumors on DWI
1) Mucinous ovarian neoplasm
2) Tuboovarian abscess
3) Sex cord stromal tumors
4) Normal ovarian stroma surrounding the benign ovarian tumor
5) Torsion of ovarian benign tumors 3. Malignant ovarian tumors without diffusion restriction, mimicking benign tumors on DWI
1) Borderline ovarian tumors with papillary projections
SUMMARY
1. Diffusion-weighted imaging combined with conventional T2-weighted imaging can be helpful in characterizing complex adnexal masses. 2. Several benign lesions with inspissated mucus, abscess, solid fibrous component and coagulative necrosis can cause diffusion restriction, mimicking malignant tumors. 3. Malignant tumors with low cellularity may not show diffusion restriction, mimicking benign tumors. 4, Radiologists should be familiar with these tricks to avoid interpretative errors in DWI for differentiating benign and malignant ovarian lesions.

Functional Imaging of Gynecologic Malignancies: A Novel Approach to an Old Problem

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LL-OBE2293

Mariano Volpacchio , MD
Joaquina Lopez Moras , MD
Veronica Rubio
Victoria Franco

Diego M Haberman , MD
Victor Llanquipacha

PURPOSE/AIM
The aim of thisexhibit is: 1. To review pathophysiologic concepts underlying gynecologic malignant tumor targeted by functional imaging evaluation 2. To discuss novel imaging modalities and techniques capable of investigating the functional aspects of gynecologic malignancies and its principles 3. To offer a useful functional imaging approach to assist in evaluating gynecologic neoplasms
CONTENT ORGANIZATION
Introduction Gynecologic malignancies pathophysiological concepts - Ovarian - Uterine - Cervical Functional imaging techniques - DWI MRI - DCE MRI - Metabolic and molecular Approach to functional imaging evaluation Summary
SUMMARY
Current functional imaging techniques allows for a noninvasive assesment of multiple tissue parameters in-vivo potentially offering useful biomarkers that prove to be crucial tools not only for diagnosis but also as prognostic and therapeutic response parameters. Use of state-of-the-art techniques in concert with an optimal approach are the current paradigm of imaging evaluation of malignan neoplasms

Role of 3T MRI in Characterization of Adnexal Masses Using Conventional Imaging, Diffusion Weighted Imaging and Contrast Dynamic Imaging with Histo-pathological Correlation

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LL-OBE2294
Sharad Maheshwari , MD
Abhijit A Raut , MD
Dimple Jain , MBBS
Bijal Kulkarni , MBBS, MD

PURPOSE/AIM
Aim of this exhibit is to familiarise radiologist with role of MRI in characterization of adnexal mass lesion beyond conventional imaging at high field MRI. Imaging technique will be discussed with an algorithm to approach adnexal mass lesion. Histopathological correlation will be provided with corroborative MRI images.
CONTENT ORGANIZATION
1. Indications of MRI. 2. MRI technique and pitfalls. 3. Importance of Diffusion Weighted Imagin and Dynamic contrast imaging. 3. Approach to review adnexal mass lesions. 4. Radio-pathological correlation. 5. Impact of MRI on clinical and surgical management.
SUMMARY
Though ultrasound is an excellent modality to evaluate adnexal masses as a first step, but at times it can be a dillema in differentiation of benign vs malignant masses. MRI with excellent soft tissue resolution and no ionizing radiation, makes it a imaging of choice in such situations. With newer techniques like diffusion weighted imaging and dynamic contrast imaging it remains a problem solving modality. it also helps surgeons in deciding the best approach and surgical plan.

MR Findings of the Various Uterus Tumor in the Endometrial Cavity: What is the Differential Diagnosis?

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LL-OBE2295
Eito Kozawa , MD, PhD
Masahiro Takahashi , MD
Waka Mizukoshi , MD
Yoshitaka Okada , MD
Masanori Yasuda
Keiichi Fujiwara
Fumiko Kimura , MD, PhD *

PURPOSE/AIM

- To illustrate the various tumors in the endometrial cavity and to discuss the cause of MR imaging findings.
- To review MR imaging findings in the endometrial cavity and correlate them to pathologic findings.
- To learn the crucial MR imaging findings in differentiating from other uterus masses.

CONTENT ORGANIZATION
The cases will be presented in a quiz format. Key differential diagnostic points and pitfalls will be highlighted in the discussion of each case. The list of cases includes:

- endometrioid adenocarcinoma
- clear cell carcinoma
- carcinosarcoma
- adenosarcoma
- atypical polypoid adenomyoma with endometrioid adenocarcinoma
- atypical polypoid adenomyoma
- typical polypoid adenomyoma
- submucosal uterus myoma
- endometrial polyp

SUMMARY
The major learning points of this exhibit are:

- A stalk attached to the myometrium of the uterine body can consist of various types of tumors from benign tumors to malignant tumors.
- In differential diagnosing of various tumors in the endometrial cavity, it is important to know the reason of MR signal intensity such as dilation of the endometrial gland, and presence of fibrous tissue or hemorrhage.
- It is important to be familiar with variety of imaging appearance of various tumors in the endometrial cavity to accurate differential diagnosis.

Radiologic Findings of the Obstetric Uterine Bleeding: From Gestation to Puerperal Period

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LL-OBE2296
Boem Ha Yi , MD, PhD
Hae-Kyung Lee , MD
Min Hee Lee , MD
Ji Eun Lee , MD
Jae Myeong Lee
Tae Hee Kim , MD

PURPOSE/AIM
To present ultrasound, CT, angiography, and MR images of the diseases responsible for uterine bleeding in each trimester of pregnancy and postpartum period. To help decide diagnostic modality and management plan, clinical outcome of each disease related with vaginal bleeding during pregnancy.
CONTENT ORGANIZATION
In First trimester, ultrasound findings of threatened abortion, ectopic pregnancy, uterine arterio-venous fistula after DandE, normal early pregnancy, gestational trophoblastic disease will be presented with recommendable follow up plan and embolization images. The second and third trimester: placental abnormality including placenta previa and abruption, incompetent internal os of cervix (IIOC), and rupture of membrane in one of twin pregnancy. Immediate postpartum or puerperal period, CT, MR, angiographic characteristics and serial changes of sonographic features of retained placenta with or without placenta accreta, and uterine atony are going to be introduced
SUMMARY
Major Teaching points: 1. To know the variable causes of pregnancy related vaginal bleeding 2. To understand the radiologic characteristics of each diseases. 3. To make it possible to decide optimal diagnostic modality, and understand the management procedure and prognosis

Imaging of MÃ¼llerian Duct Anomalies

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LL-OBE2297
Bum Sang Cho , MD
Soojung Lee
Kil Sun Park
Sung J Kim , MD, PhD

Sang-Hoon Cha , MD, PhD
Seung Young Lee , MD
Min Ho Kang
Kyung Sik Yi , MD

PURPOSE/AIM
CONTENT ORGANIZATION
Classification of müllerian duct anomaly 1. hypoplasia/agenesis
2. unicornuate
3. didelphys
4. bicornuate
5. septate
6. arcuate
7. DES drug related With each classifications,
; definition, pathology
; imaging findings with each imaging techniques (HSG, USG, CT and MR) for each cases
; complication and treatment
SUMMARY

Patterns of Peritoneal Disease in Relapsed Ovarian Cancer on Diffusion-weighted MRI (DWI)

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LL-OBE2298

Nina Tunariu , MD
Dariush Douraghi-Zadeh , BSc, BMBS
Dow-Mu Koh , MD, FRCR
Angela George , MD,MBBS
Susana Banerjee , MD, MBBS
Syed A Sohaib , MBBS

PURPOSE/AIM
1. To review the peritoneal spaces relevant to the spread of relapsed ovarian cancer 2. To describe the patterns of peritoneal disease in relapsed ovarian cancer on DWI and their management implications 3. To discuss DWI for assessing disease extent, treatment response and determine management.
CONTENT ORGANIZATION
SUMMARY
1. Different patterns of disease can be recognized in relapsed ovarian cancer on DWI. 2. DWI can be used to monitor tumor response and define the burden of disease after treatment

Clinical Impact of Lipid Detection in Gynecologic Pathologies by Advanced MR Techniques

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LL-OBE2299

Mayumi Takeuchi , MD
Kenji Matsuzaki , MD, PhD
Masafumi Harada , MD, PhD

PURPOSE/AIM
Various gynecologic pathologies may contain lipid component as fat tissue in mesenchymal or germ cell tumors, as intracellular lipid in functioning ovarian tumors, as necrosis/apoptosis-associated lipid droplets in high grade malignant tumors and tumors after radiotherapy or chemotherapy, or as metabolic products in abscess. We demonstrate clinical significance of lipid detection for the differential diagnosis and for the evaluation of therapeutic response in gynecologic pathologies by using advanced MR techniques.
CONTENT ORGANIZATION
Pathogenesis of lipid-containing gynecologic lesions
Advanced MR techniques: CSI, 3D dual-echo Dixon, MR Spectroscopy (MRS)
Clinical significance of lipid detection
Diagnostic and therapeutic strategy
SUMMARY
1. Detecting small amount of fat by CSI, 3D dual-echo Dixon and MRS is helpful for the diagnosis of ovarian teratomatous tumors and uterine lipoleiomyoma.
2. Functioning ovarian tumors such as thecomas containing abundant intracellular lipid can be diagnosed by MRS with high accuracy.
3. Evaluation of necrosis-associated lipid in malignant tumors is useful in distinguishing from benign tumors, and in assessing therapeutic response of radiotherapy or chemotherapy.

Uterine Sarcomas: Challenge for Preoperative Diagnosis by MRI

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LL-OBE2300

Satomi Kitai
Reina Kawakami
Tohru Sekiya
Kunihiko Fukuda , MD

PURPOSE/AIM
The purpose of this exhibit is:

1. To know current status of preoperative diagnosis of uterine sarcomas by imaging
2. To learn classification of uterine sarcomas
3. To learn imaging features of uterine sarcomas of each histological type
4. To challenge correct preoperative diagnosis for uterine sarcomas

CONTENT ORGANIZATION
WHO classification of uterine sarcomas Clinical aspects and pathological features of each histological type: leiomyosarcomas, endometrial stromal sarcomas, carcinosarcomas and adenosarcomas Review of maging findings

- MR imaging features of uterine sarcomas: T2WI, T1WI, DWI and dynamic contrast-enhanced (DCE) study
- imaging characteristics of each histological type
- differential diagnosis

Case presentations Summary
SUMMARY
The major teaching points of this exhibit are:

1. Uterine sarcomas are rare and preoperative diagnosis is often difficult.
2. Each subtype of uterine sarcomas have different clinical behaviors and imaging features.
3. MRI including DWI and DCE study may be capable to differentiate uterine sarcomas from benign uterine tumors.

Review of Placental Disease: MRI and Ultrasonographic Findings

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LL-OBE2301

Naomi Yagi
Yoshimitsu Ohgiya , MD
Makoto Saiki
Jumpei Suyama , MD, PhD
Masanori Hirose , MD
Takehiko Gokan , MD

PURPOSE/AIM
The purpose of this exhibits is to show clinical key facts, including risk factors and prognosis, and imaging of major placental disease especially MRI findings.

CONTENT ORGANIZATION
The exhibit will be organized under the following subheadings:
1.Dissection of normal placenta with illustrations and MRI imaging
2.Brief review; Comparison utility and characteristics of modality between US and MRI
3.Provide a pictorial illustration of MR findings with some cases.
We will show under following headlines.
1)Placental infarction
2)Hemorrhage: retroplacental, subchorionic, and ubamniotic hemorrhage
3)Twin gestations with Placenta accreta
4)Placenta previa:total placenta previa, partial placenta previa, and marginal placenta previa
5)Placental insufficiency
6)Placental hemangioma
7)Hydatidiform mole: Partial hydatidiform mole
8)Retained placenta
SUMMARY
1.To illustrate appearance of placental abnormality.
2.To correlate MRI and ultrasonography findings in placental abnormality.

One Giant Leap for Womankind: Evaluating the Role of the 3D Turbo Spin Echo T2 Weighted (3D TSE T2W)/SPACE Sequence in Imaging the Female Pelvis

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LL-OBE2302

Sahar Naaseri , MBBS, BSc
Sofia Otero , MBBCh
Natasa Devic , MBBS, MRCS
Priya Narayanan , MBBS

PURPOSE/AIM
The 3D TSE T2W/SPACE sequence allows multiplanar imaging reformats to be performed in any orientation which can be very useful in evaluating the female reproductive tract. This exhibit will describe the potential role and discuss limitations of this sequence with regard to benign and malignant gynaecological pathology.
CONTENT ORGANIZATION
• To describe the physics of the 3D TSE T2W sequence and how it compares to the conventional 2D TSE T2W sequence
• To perform a literature review of the applications of the 3D TSE T2W sequence in assessing the female pelvis
• To illustrate the advantages and limitations of imaging the gynaecological tract with specific reference to:

- Staging of uterine and cervical cancer
- Assessment of deep pelvic endometriosis
- Congenital malformations of the uterus

SUMMARY
Use of the 3D TSE T2W/SPACE sequence can be an invaluable tool in the imaging of the female reproductive tract due to the ability to perform multiplanar reformats in any orientation and we have incorporated this sequence into our gynaecological MR imaging protocol. Our exhibit demonstrates the added value and potential limitations of this sequence.

Diagnostic and Therapeutic Strategy for Secondary Malignant Involvement of Gynecologic Organs

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LL-OBE2303

Mayumi Takeuchi , MD
Kenji Matsuzaki , MD, PhD
Masafumi Harada , MD, PhD

PURPOSE/AIM
Metastatic tumor in gynecologic organs may often be the initial manifestation of disease, so radiologists should recognize the imaging findings of secondary malignant involvement. Pathways from primary sites are various: hematogenous or lymphatic metastases, trans-coelomic dissemination, and direct, trans-vaginal or trans-tubal invasion. We demonstrate wide spectrum of clinical and imaging manifestations, and describe the clues to differentiate from primary gynecologic tumors by using problem-solving MR techniques.
CONTENT ORGANIZATION
Clinical course, imaging manifestations and metastatic pathways
Common and uncommon primary sites
Problem-solving MR techniques: DCE-MRI, DWI, MRS
Diagnostic and therapeutic strategy
SUMMARY
1. Bilaterality, T2-low stromal proliferation for Krukenberg's tumor, stained-glass appearance for colon cancer, organic scalloping with pseudomyxoma peritonei for appendiceal cancer are suggestive findings for secondary ovarian involvement.
2. DWI and DCE-MRI are helpful in distinguishing from benign lesions, in revealing diffuse infiltrative uterine involvement, and in detecting occult primary sites or small metastasis.
3. Solid or complex ovarian mass with choline, lipid, and N-acetyl mucinous compounds peak on MRS is suggestive for metastatic mucinous tumor from gastrointestinal tracts.

Serous Tumors in the Female Pelvis: Imaging Findings

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LL-OBE2304

Satomi Kitai
Reina Kawakami
Tohru Sekiya
Kunihiko Fukuda , MD

PURPOSE/AIM
The purpose of this exhibit is:

1. To recognize the variety of serous tumors in the female pelvis
2. To understand clinical features, pathological findings and genetic aspects
3. To learn imaging findings of serous tumors in the female pelvis

CONTENT ORGANIZATION
Serous tumors in the female pelvis

- primary organs: ovary, fallopian tube, uterus, peritoneum
- clinical features, pathological findings and genetic aspects

Imaging characteristics

- serous carcinomas of the ovary, fallopian tube and peritoneum: similarity and difference
- ovarian serous borderline tumors: characteristics and differentiation from cancers
- endometrial carcinomas: serous vs endometrioid

Case presentations

- ovary: serous adenomas, borderline tumors and carcinomas
- fallopian tube serous carcinomas
- peritoneal serous carcinomas
- endometrial serous carcinomas

SUMMARY
The major teachig points of this exhibit are:

1. Serous carcinomas, the most common histological subtype of ovarian carcinomas, also arise from the fallopian tube, peritoneum and uterine

endometrium.
2. Differences exist in imaging findings and also therapeutic choice between ovarian serous carcinomas and borderline tumors.
3. Fallopian tube cancer resembles ovarian cancer, though some differences exist clinically and radiologically.

Many Faces of Ovarian Teratomas: Usual, Unusual Imaging Manifestations, Pitfalls, and Problem-solving MR Techniques

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LL-OBE2305

Mayumi Takeuchi , MD
Kenji Matsuzaki , MD, PhD
Masafumi Harada , MD, PhD

PURPOSE/AIM
Teratomas are the most common ovarian tumors and the diagnosis may be easily made by detecting calcification and adipose tissue in typical cases. However, teratomas with atypical manifestations may be occasionally encountered. We demonstrate usual and unusual imaging manifestations of ovarian teratomas and their complications, and describe diagnostic clues by using problem-solving MR techniques.
CONTENT ORGANIZATION
Pathological features, clinical course, imaging manifestations, complications and pitfalls
Problem-solving MR techniques: CSI, 3D dual-echo Dixon, DCE-MRI, DWI, MR Spectroscopy (MRS)
Diagnostic and therapeutic strategy
SUMMARY
1. Fat-saturation is useful for the diagnosis of typical teratomas, whereas CSI, 3D dual-echo Dixon and MRS are helpful in evaluating atypical fat-scant lesions. Various signs may be diagnostic: palm tree-like protrusion, hair ball, gravity-dependent layering, floating fat balls. DCE-MRI and DWI can reveal malignant transformation or disseminated immature implants, however, there may be pitfalls due to false-positive findings.
2. Clinical and imaging manifestations of monodermal teratomas (struma ovarii, carcinoid, neural tumors), and various complications of teratomas (malignant transformation, torsion, rupture, chemical peritonitis, peritoneal gliomatosis, Anti-NMDA receptor encephalitis) should be recognized.

Diagnostic Strategy for Benign Tumor-like Lesions Mimicking Malignancy in the Female Pelvis

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LL-OBE2306

Mayumi Takeuchi , MD
Kenji Matsuzaki , MD, PhD
Masafumi Harada , MD, PhD

PURPOSE/AIM
Various physiologic, infectious, ischemic, inflammatory, or endometriotic conditions may affect the morphologic appearances of female reproductive organs dramatically and may cause non-neoplastic tumor-like lesions mimicking malignancy. Making accurate diagnosis is important for appropriate management of patients to avoid excess surgical procedure. We demonstrate wide spectrum of clinical and imaging manifestations of benign tumor-like lesions and review the advanced MR techniques in differential diagnosis and addressing therapeutic strategy.
CONTENT ORGANIZATION
Clinical course, imaging manifestations and pathogenesis
Problem-solving MR techniques: DCE-MRI, DWI, MRS, SWI, cine-MRI
Practical decision tree in making differential diagnosis
Diagnostic and therapeutic strategy
SUMMARY
Ovarian enlargement (massive ovarian edema, fibromatosis, PCO, torsion, hyperreactio luteinalis, pregnancy luteoma, oophoritis), endometriosis-associated lesions (polypoid, decidualized, deep endometriosis with organic involvement), uterine lesions (adenomyosis, myometrial contraction, abscess/pyometra), peritoneal lesions (inclusion cyst, tuberculosis, actinomycosis, gossypiboma) may mimic malignant tumors and should be differentiated from malignancy by using problem-solving MR techniques with adequate clinical information of patient's physiological states.

Myometrial Hemorrhage and It's Large Spectrum of Lesions: How to Differentiate Harmless from Evil Based on MRI Findings?

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LL-OBE2307

Fernando M De Carvalho , MD
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Carla Junqueira , MD
Luiza D Werneck , MD
Thamara Perrone
Romulo Varella , MD
Milena Belmock

PURPOSE/AIM
The purpose of this study is to discuss about the many different causes of myometrial hemorrhage, distinguishing benign from malignant causes based on MR imaging and about the ideal MR protocol to maximize bleeding detection.
CONTENT ORGANIZATION
1. Normal anatomy of the uterus, based on MR imaging and schematic drawings. 2. Myometrium variation according to hormonal status. 3. MR imaging protocol. How to maximize the detection of bleeding? 4. Causes of myometrial hemorrhage in the non-pregnant patient: - Non-tumoral: Adenomyoma, cystic adenomiosis, hematoma, unicornuate uterus with noncommunicating cavitary rudimentary horn. - Tumoral: Leiomyoma with red degeneration, leiomyosarcoma, myometrial invasion by endometrial cancer, Metastases.
SUMMARY
Myometrial hemorrhage has a nonspecific clinical presentation, and may be found in benign and malignant diseases. MR imaging can properly assess myometrial anatomy and correctly diagnose the main causes of myometrial hemorrhage, allowing the radiologist to guide the correct treatment.

Is Real Time Elastography a Feasible Tool to Assess Uterine Fibroids?

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LL-OBE2308

Paolo Ricci , MD
Chiara Marigliano , MD
Federica Ciolina
Luisa Molisso , MD
Giovanna Panzironi
Alessandro Napoli , MD
Vito Cantisani , MD

PURPOSE/AIM
To show the possible role of real time elastosonography (RTE) with transabdominal (TA) and transvaginal (TV) approaches in the evaluation of uterine fibroids. To describe the variation in stiffness of fibroids in patients undergoing different treatments (i.e surgery, ormonal therapies, embolization, MRgFUS)
CONTENT ORGANIZATION
Authors show how to correctly perform RTE examinations by TA and TV approaches, providing the basis for a correct interpretation of the images, including color maps and measurements of strain of the fibroids and strain ratio between fibroids and normal myometrium. Also the authors present the preliminary results of pre- and post-treatment RTE in a small cohort of patients treated by MRgFUS.
SUMMARY
Although US is currently the first-line examination for uterine fibroids, RTE is not routinely done. RTE is a promising tool that can provide detailed mapping and characterization of uterine fibroids. This could improve US evaluation of size, volume and delineation of uterine fibroids before any further treatment.

Problem-solving MR Spectroscopy in Gynecologic Lesions: Challenging Cases in which MRS is Helpful in Refining the Diagnosis

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LL-OBE2309

Mayumi Takeuchi , MD
Kenji Matsuzaki , MD, PhD
Masafumi Harada , MD, PhD

PURPOSE/AIM
Proton MR spectroscopy provides metabolic information, and may add valuable information for the diagnosis in distinguishing benign and malignant tumors, and in estimating the specific histological subtypes. We present challenging cases with gynecologic lesions in which in-vivo MRS is helpful in refining the diagnosis.
CONTENT ORGANIZATION
Basic techniques of MRS and interpretation of metabolites
Case presentation
Practical decision tree in making differential diagnosis
Limitations in using MRS in clinical trials
SUMMARY
1. High choline concentration reflecting cellular proliferating activity in solid tumors is suggestive for malignancy, however, massive necrosis in high grade malignant tumor may reduce choline signal and necrosis-associated high lipid peak is suggestive for malignancy.
2. Myogenic creatine for leiomyomas, N-acetyl mucinous compounds for mucinous or myxoid tumors, intracellular lipid for functioning ovarian tumors may provide specific metabolic information for tissue characterization.
3. Acetate and succinate resulting from the enhanced glycolysis and fermentative pathways are suggestive for anaerobic infection and useful in differentiating from aerobic or sterile abscesses.

The Black Plague of the Pelvis: Review of Endometriosis Imaging Findings and Radiologic-pathologic Correlation

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LL-OBE2310

Anne Gill , MD
Nicholas L Henson , MD
Courtney A Coursey , MD *
Nicholas Fogelson , MD
Krisztina Hanley , MD
Pardeep K Mittal , MD

PURPOSE/AIM
• To discuss the pertinent imaging findings on US, CT, and MRI for both pelvic and distant anatomical endometrial implants
• To correlate the radiologic findings with pathologic specimens from the selected cases
• To describe the complications associated with pelvic and extra-pelvic endometriosis as well as current therapy recommendations
CONTENT ORGANIZATION
• Review the pathophysiology of endometriosis and theories of implantation within the pelvis and extra-pelvic sites
• Demonstrate the pertinent imaging findings on US, CT, and MRI including the benefits and pitfalls of various MRI sequences (T1W fat-saturation suppression, T2W, T1W without and with Gadolinium)
• Correlation of radiologic findings with pathologic examples of pelvic and extra-pelvic endometriosis including brain, pulmonary, gastrointestinal, urinary, and cutaneous lesions and their complications
• Describe current therapeutic methods and follow up imaging recommendations
SUMMARY
Endometriosis is a well-known and pervasive cause of pelvic pain and infertility. As imaging protocols become more precise and experience increases with MRI, better clinical information can be gained with less invasive methods. Appropriate clinical management of the patient depends on accurate diagnosis and thorough evaluation of the involved anatomical sites.

Diagnostic and Therapeutic Strategy for Uterine Cervical Lesions

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LL-OBE2311

Mayumi Takeuchi , MD
Kenji Matsuzaki , MD, PhD
Masafumi Harada , MD, PhD

PURPOSE/AIM
However the diagnosis of cervical cancer is usually made by colposcopy with biopsy, it may be encountered atypical or problematic cases with cervical lesions. We demonstrate wide spectrum of clinical and MR manifestations of benign and malignant cervical lesions with pathologic correlation, and review the advanced MR techniques in differential diagnosis, tumor staging, and addressing therapeutic strategy.
CONTENT ORGANIZATION
Clinical, pathological and MR imaging features
-Benign: Polyp; Leiomyoma; Endometriosis; Nabothian cyst; LEGH
-Malignant: Carcinomas (Squamous, Adenosquamous, Mucinous, MDA, Small cell, Glassy cell, Villoglandular adenocarcinoma)
-Polypoid corpus tumors protruding into the cervix: Submucosal myoma, Endometrial polyp/carcinoma, Adenosarcoma, Carcinosarcoma, APA
Diagnostic and therapeutic strategy according to the new FIGO staging
SUMMARY
1. In distinguishing malignant cervical tumors from benign lesions, high intensity on DWI with low ADC due to hypercellularity, and high choline/lipid concentration reflecting high metabolic activity with apoptosis/necrosis on MRS are suggestive for malignancy.
2. Morphological characteristics revealed on high resolution MRI at 3T, hypervascular minute cancerous foci revealed on 3D-DCE-MRI, and metabolite pattern (Cho, Cr, Lip, NAMC) on MRS may contribute to the differential diagnosis.

BOOST: Gynecology-Anatomy and Contouring (An Interactive Session)

Monday, 08:30 AM - 10:00 AM • S103CD

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RO OI OB GU

MSRO24 • *AMA PRA Category 1 Credit* ™:1.5 • ARRT Category A+ Credit:1.5

Co-Director
Fergus V Coakley , MD
Co-Director
Bruce G Haffty , MD
Beth A Erickson , MD
Paul M Knechtges , MD *
Mark D Hohenwalter , MD

LEARNING OBJECTIVES
1) Review the radiologic features of female gynecologic cancers for both intact and post-operative presentations. 2) Review the radiologic features of female gynecologic cancers before, during and after external beam irradiation and brachytherapy. 3) Review the recommended external beam and brachythreapy contouring guidelines for intact and post operative gynecologic cancer presentations.
ABSTRACT
The treatment of gynecologic cancers with radiation as a component of treatment requires a clear understanding of the imaging characteristics of disease before and after radiation. Knowledge of the patterns of cancer spread , both locally and regionally, is important in designing radiation treatment plans which may include external beam and/or brachytherapy. Proper contouring of radiation targets and organs at risk is essential in developing treatment plans which maximize the benefits and minimize the risks of radiation, both for external beam and brachytherapy. The subsequent follow up of patients with imaging after radiation is also important in helping to identify recurrent disease and complications.Radiation oncologists and radiologists working in collaboration can enhance the care of these patients before, during and after treatment.

First Trimester Ultrasound

Monday, 08:30 AM - 10:00 AM • S405AB

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US OB GU

RC210 • *AMA PRA Category 1 Credit* ™:1.5 • ARRT Category A+ Credit:1.5

RC210A • Diagnosis of Nonviable Pregnancy

Peter M Doubilet MD, PhD (Presenter)

LEARNING OBJECTIVES

1) Know the sonographic criteria for definite miscarriage and probable miscarriage in the early first trimester. 2) Understand that any saclike intrauterine structure (rounded edges, no yolk sac or embryo) in a woman with a positive pregnancy test is highly likely to be a gestational sac. 3) Understand that nonvisualization of an intrauterine gestational sac in a woman with hCG above the 'discriminatory' level (2000 mIU/ml) does not exclude the possibility of a viable pregnancy.

ABSTRACT
I. Sonographic Criteria for Diagnosing Pregnancy Failure (Miscarriage) in an Intrauterine Pregnancy of Uncertain Viability [Note: an intrauterine fluid collection with rounded edges in a woman with positive hCG is almost certainly a gestational sac; it is definitely a gestational sac if it contains a yolk sac or embryo.] 1. Criteria for definite miscarriage (i) CRL =2 weeks after a scan that showed a gestational sac without yolk sac; (iv) Absence of embryo with heartbeat >=11 days after a scan that showed a gestational sac with yolk sac 2. Criteria suspicious for miscarriage (i) CRL =6 weeks after LMP; (vi) Empty amnion (amnion seen adjacent to yolk sac, with no visible embryo); (vii) Enlarged yolk sac (>7 mm); (viii) Small gestational sac size in relation to the embryo II. Guidelines Related to the Possibility of a Viable Intrauterine Pregnancy in a Pregnancy of Unknown Location (positive pregnancy test and no intrauterine or ectopic pregnancy seen on ultrasound) 1. A single hCG, regardless of its level, does not reliably distinguish between ectopic and intrauterine pregnancy (viable or nonviable) 2. If a single hCG is =3000 mIU/ml, a viable intrauterine pregnancy is possible but unlikely. However, the most likely diagnosis is nonviable IUP, so it is generally appropriate to get at least one followup hCG before treating for ectopic pregnancy.

RC210B • Diagnosis and Treatment of Ectopic Pregnancy

Hope E Peters MD (Presenter)

LEARNING OBJECTIVES
1) Recognize the spectrum of findings at transvaginal ultrasound in ectopic pregnancy. 2) Report TVUS findings in suspected ectopic pregnancy when a non-specific intrauterine fluid collection is present. 3) Differentiate usual vs. unusual ectopic pregnancies and understand their different treatment algorithms. 4) Understand the limitations of ultrasound related to maternal and technical factors. 5) Assist clinicians with appropriate follow up/management recommendations in excluding and diagnosing ectopic pregnancy.

ABSTRACT
Transvaginal ultrasound is the primary imaging modality to evaluate suspected ectopic pregnancy, performed in patients with a positive pregnancy test and pain or bleeding. The diagnosis is most commonly made when ultrasound demonstrates no intrauterine gestational sac and an extraovarian adnexal mass is found. Ectopic pregnancies occur in the ampulla of the fallopian tube >90% of the time and therapy is well established including systemic methotrexate and/or salpingectomy. When attempting to exclude or diagnose ectopic pregnancy, TVUS may demonstrate a non-specific intrauterine fluid collection. The term pseudogestational sac should not be used to describe an intrauterine fluid collection as this term can be confusing and improperly imply ectopic pregnancy prompting premature treatment. Rather, any intrauterine fluid collection should be regarded as a potential intrauterine pregnancy and reported as such. Ectopic pregnancies may also occur in unusual locations such as: the cervix, a cesarean section scar, the interstitial portion of the fallopian tube, within the ovary or concomitant with an intrauterine pregnancy. These unusual ectopic pregnancies are a unique subset of ectopic pregnancies requiring prompt diagnosis and alternative treatment options. Ultrasound does carry with it some limitations in the diagnosis of ectopic pregnancy related to both maternal and technical factors. Prompt diagnosis of all types of ectopic pregnancy and recognizing potential early intrauterine pregnancies will allow for appropriate follow up, optimal treatment and improve outcomes for these patients.

RC210C • The Fetus in the First Trimester

Carol B Benson MD (Presenter)

LEARNING OBJECTIVES
1) Use ultrasound during the first trimester to confirm the normal development of various fetal structures at specific gestational ages. 2) acquire the correct sonographic image to measure the fetal nuchal translucency between 11 and 14 weeks gestation and recognize when the nuchal translucency is abnormal. 3) use ultrasound to detect certain serious anomalies of the fetal cranium and brain during the latter half of the first trimester. 4) distinguish between normal physiologic herniation of the bowel into the base of the umbilical cord from a ventral wall defect, such as an omphalocele or gastroschisis in the first trimester.

ABSTRACT
As sonographic technology has improved, diagnosticians have gained the ability to visualize more fetal structures during the first trimester than used to be possible with older equipment. Because of this, it is important that practitioners who perform and interpret first trimester ultrasound understand how the fetus develops and recognize the sonographic appearance of fetal structures as they become apparent at different gestational ages during the first trimester. Some fetal structures are only visible in the first trimester fetus, but are no longer apparent after that. These include the nuchal translucency and physiologic bowel herniation. The nuchal translucency is a hypoechoic band behind the fetal neck, that, when thickened, is associated with increased risk of aneuploidy and cardiac anomalies. Physiologic bowel herniation is a normal protrusion of bowel into the base of the umbilical cord that can usually be distinguished from abnormal herniations through the ventral wall, such as omphalocele and gastroschisis. The fetal cranium and brain can be evaluated during the latter half of the first trimester, and anomalies such as anencephaly and holoprosencephaly can often be diagnosed. Likewise, other anomalies of the fetus can sometimes be diagnosed during the first trimester, including amniotic band syndrome, posterior urethral valves, and cardiac anomalies. Recognition of these anomalies in the first trimester will assist in early detection of fetal abnormalities, allowing for earlier and improved counseling for patients.

Pediatric Radiology Series: Fetal - Neonatal Imaging

Monday, 08:30 AM - 12:00 PM • S102AB

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PD OB GU

VSPD21 • *AMA PRA Category 1 Credit* ™:3.25 • ARRT Category A+ Credit:4
Moderator
Christopher I Cassady , MD
Moderator
Beth M Kline-Fath , MD
Moderator
Richard A Barth , MD *

VSPD21-01 • Fetal Neuro Imaging

Beth M Kline-Fath MD (Presenter)

LEARNING OBJECTIVES
1) The participant will briefly review basic prenatal neurosonology and fetal MR imaging sequences. 2) The embryology of the fetal brain will be correlated with important landmarks identified on MR imaging for each gestational age. 3) The learner will be able to utilize the appearance of the germinal matrix, brain parenchymal signal, sulcation and myelination to verify normal fetal brain anatomical milestones.

ABSTRACT

VSPD21-02 • Does Fetal MRI Add Clinically Important Information in Cases of Isolated Ventriculomegaly Revealed by Tertiary Antenatal Ultrasound?

Stacy K Goergen MBBS (Presenter) ; **Tejaswi Kandula** MBBS ; **Michael Fahey** MBBS, PhD *

PURPOSE
Antenatal counselling for fetal cerebral ventriculomegaly (VM) is guided by size of the ventricles and the presence and nature of concurrent structural abnormalities. There are limited consensus guidelines regarding the role of fetal magnetic resonance imaging (FMRI) as an adjunct to ultrasound (US) in cases of isolated VM (IVM). The evidence suggests that MRI is indicated when IVM on US is severe (>15mm), but there is less agreement about its role when IVM is mild or moderate (10-15mm). Our aim was to evaluate the incidence of additional findings on FMRI when IVM is identified on tertiary level antenatal US.

METHOD AND MATERIALS
We prospectively analyzed data from a single university affiliated, tertiary referral fetal diagnostic / therapy unit. Inclusion criteria were singleton or twin pregnancies evaluated with antenatal US performed prior to FMRI with a resulting diagnosis of IVM. Amniocentesis was offered prior to FMRI but variably performed depending on maternal preference.

RESULTS
59 pregnancies studied between November 2006 and February 2013 fulfilled inclusion criteria. Median gestational age at US was 26 weeks (21-36) and timing of FMRI was 28 weeks (22-37). Median time elapsed between US and FMRI was 7 days (0-21). In 41/59 cases, there was agreement between ultrasound and MRI regarding severity of VM. Additional findings on FMRI were seen in 5/42 fetuses (11.9%) with US diagnosed mild VM, 0/10 with moderate VM, and 4/7 (57.1%) with severe VM. Of these 9 cases, 2 had amniocentesis both with a normal result. The additional findings were clinically significant in 2/5 cases with mild VM compared with 4/4 cases with severe VM. These included periventricular nodular heterotopia, foramen of Monro subependymal nodule in tuberous sclerosis, absent septum pellucidum with postnatal diagnosis of septooptic dysplasia, and agenesis of the corpus callosum.

CONCLUSION
Clinically significant cranial abnormalities on FMRI, specificially midline anomalies and malformations of cortical development, were were identified in 5% of fetuses with mild to moderate IVM on tertiary antenatal US. The low rate of additional findings in this group is consistent with other recently published data.

CLINICAL RELEVANCE/APPLICATION
The low yield of clinically important abnormalities on FMRI when VM is isolated and mild to moderate in severity on high quality antenatal US should inform antenatal counselling and referral pathways.

VSPD21-03 ● Can Prenatal US Stand Alone to Diagnose Microcephaly or Is Fetal Head MRI Needed?

Gal Yaniv MD, PhD (Presenter) ; **Eldad Katorza** ; **Vered P Tsehmaister Abitbol** MD ; **Gilad Twig** ; **Salim Bader** ; **Eli Konen** MD ; **Chen C Hoffmann** MD

PURPOSE
To evaluate the agreement between ultrasound (US) and fetal head magnetic resonance imaging (feMRI) head biometry.

METHOD AND MATERIALS
A retrospective analysis was performed on 60 sequential feMRI scans obtained between 2011-2013 following US diagnosis of microcephaly w/wo severe intrauterine growth retardation (IUGR: head circumference =-2 standard deviations [SD] and estimated fetal weight [EFW] =2 SD). Inclusion criteria were single fetus and fewer than 21 days between performance of US and feMRI. The mean gestational age (GA) of fetuses at US and feMRI acquisition was 33±3.3 and 34±3 weeks, respectively. The mean interval between US and feMRI scanning was 7.3±6 days. Biparietal diameter (BPD) and occipitofrontal diameter (OFD) results were converted to percentiles and SD by Chervenak and Hadlock normograms for US and compared to Garel normograms for feMRI. US measurements of OFD were recorded in 36/60 of the scans. Data on GA, EFW and interval between scans were also recorded.

RESULTS
Forty-two of the 60 fetuses with US-suspected microcephaly (70%) were IUGR. BPD values were =-2 SD in only 5 (8.3%) according to feMRI (*P*P
CONCLUSION
There is discrepancy between US and feMRI findings in the assessment of fetal head biometry. US measurements are performed only on the skull, while feMRI enables direct measurement of the brain. Abnormal anatomical findings are more predictive for true microcephaly in both US and feMRI. Thus, diagnosis of microcephaly by US alone is not sufficient and should be validated by feMRI before a final diagnosis is established and consultations with the parents are held.

CLINICAL RELEVANCE/APPLICATION
The diagnosis of microcephaly can lead to pregnancy termination, and diagnosis by US alone is insufficient and requires confirmation by a feMRI study.

VSPD21-04 ● Evaluation of ADC Values of the Dead Fetus Compared to Fetal Brain Infarct and Normal Siblings in Twin Pregnancies Complicated with TTTS

Ronen Bercovitz RT, MA (Presenter) ; **Boaz Weisz** ; **Gal Yaniv** MD, PhD ; **Chen C Hoffmann** MD ; **Shlomo Lipitz** ; **Anat Biegon** ; **Eldad Katorza**

PURPOSE
To evaluate the ADC values in the dead fetus, compared to brain infarct and to normal sibling in cases of monochorionic biamniotic (MCBA) twins, suffering from complications of twin to twin transfusion syndrome (TTTS).

METHOD AND MATERIALS
A retrospective analysis was performed on 70 sequential MRI scans of fetuses in cases of MCBA pregnancies complicated with TTTS between 2009-2012. 15 women with MCBA pregnancies (mean maternal age 31 years, gestational age range 18-32, 1-4 scans/subject) were included. Follow up scans performed 1-72 days after ischemia to monitor the living remaining fetus. Whole brain ADC values (expressed in mme2 /secx10 6) were obtained at 5 weeks after ischemia. In the cases with infarcts ADC was measured in the infracted zone. All measurements were performed using a GE workstation. The results of the dead fetuses and of the infracted zones in the living fetuses were compared to the normal siblings

RESULTS
The mean (SD) ADC value in the normal fetuses was 1675 (277), compared to 684 (165) in dead fetuses and 1097 (546) in infarcted brains (p
CONCLUSION
The ADC value in dead fetuses increases slowly with time, and does not reach normal values even months after death, while the values in the infracts of the living fetus normalize within 2 weeks, as was reported in early life and in adulthood. The reason for this phenomenon is unclear, and may be due to the unchanged environment of the dead fetus while the pregnancy continues with the second healthy sibling. A second factor may be lack of blood flow in the dead fetus, thus the tissue is 'frozen' and not liquefied.

CLINICAL RELEVANCE/APPLICATION
The time of death of a fetus cannot be determined by the low ADC value, which can stay low for more than 5 weeks.

VSPD21-05 ● Congenital Diaphragmatic Hernia: Fetal and Neonatal Correlation

Christopher I Cassady MD (Presenter)

LEARNING OBJECTIVES
1) Identify the application of basic anatomic, pathologic, and physiologic principles to congenital diaphragmatic hernia. 2) Analyze imaging and therapeutic techniques and apply this knowledge to protocol development, patient management/safety, and cost in the management of CDH. 3) Demonstrate understanding of the influence of socioeconomic issues on current and future practice patterns for this referral. 4) Compare indications for specific imaging strategies in CDH.

VSPD21-06 ● Correlation of the Observed-to-Expected MR Fetal Lung Volume and the Observed-to-Expected US Lung-to-Head Ratio at Different Times of Gestation in Fetuses with Congenital Diaphragmatic Hernia

Katrin Kastenholz (Presenter) ; **Anna Walleyo** ; **Christel Weiss** ; **Angelika Debus** MD ; **Claudia Hagelstein** MD ; **Meike Weidner** ; **Thomas Schaible** ; **Stefan O Schoenberg** MD, PhD * ; **Karen Busing** ; **Sven Kehl** MD ; **Wolfgang Neff** MD, PhD

PURPOSE
Determination of the observed-to-expected MR fetal-lung-volume (o/e MR FLV) and observed-to-expected US lung-to-head ratio (o/e US LHR) are both quantitative methods to predict clinical outcome in fetuses with congenital diaphragmatic hernia (CDH). The purpose of this study was to evaluate the potential of the o/e MR FLV and o/e US LHR to evaluate survival, need for extracorporeal membrane oxygenation (ECMO) therapy and development of chronic lung disease (CLD) at different times of gestation (32 weeks gestation (w.g.)) and especially to individually compare the o/e MR FLV and the o/e US LHR for each fetus.

METHOD AND MATERIALS
In total 201 fetuses were included in this study and o/e MR FLV and o/e US LHR were calculated for 270 examinations performed within 72 hours (62 examinations 32 w.g.). Prognostic accuracy of o/e MR FLV and o/e US LHR was assessed by performing receiver operating characteristic curve (ROC) analysis and correlation was determined using linear regression analysis.

RESULTS
At all times of gestation investigated our results revealed significant differences of both o/e MR FLV and o/e US LHR for neonatal survival or no survival, need for ECMO therapy and development of CLD or not (p-values between
CONCLUSION
O/e MR FLV and o/e US LHR are highly valuable prognostic parameters for prenatal prediction of survival, need for ECMO therapy and development of CLD in fetuses with left sided CDH for all times of gestation. No prognostic significance was obtained in cases of right sided CDH. O/e MR FLV and o/e US LHR correlate significantly for patients with left sided CDH, best when examinations are performed prior to 32 w.g.. No significant correlation of both parameters could be found in fetuses with right sided CDH.

CLINICAL RELEVANCE/APPLICATION
O/e MR FLV and o/e US LHR are reliable prognostic parameters and correlate well for prenatal prediction of survival, need for ECMO therapy and development of CLD in fetuses with left sided CDH.

VSPD21-07 ● Magnetic Resonance Imaging Based Ratio of Fetal Lung Volume to Fetal Body Volume as a New Prognostic Marker in Growth Restricted Fetuses with Congenital Diaphragmatic Hernia

Meike Weidner (Presenter) ; **Claudia Hagelstein** MD ; **Angelika Debus** MD ; **Anna Walleyo** ; **Christel Weiss** ; **Stefan O Schoenberg** MD, PhD * ; **Thomas Schaible** ; **Karen Busing** ; **Wolfgang Neff** MD, PhD

PURPOSE
Several prenatal prognostic parameters for fetuses with congenital diaphragmatic hernia (CDH) exist. Most of them reference to a control group, which can be

problematic if individual fetal development differs from expectation. To overcome this, we evaluated the prognostic accuracy of the individually calculated magnetic resonance imaging (MRI) based ratio of fetal lung volume (FLV) to fetal body volume (FBV) concerning survival in congenital diaphragmatic hernia (CDH), especially in fetuses with growth restriction.

METHOD AND MATERIALS

RESULTS

CONCLUSION
The MRI based ratio (FLV/FBV) is a highly reliable prenatal predictor of neonatal survival in children with CDH. Unlike other prognostic parameters (e.g. observed/expected MR-FLV, ultrasound based observed/expected lung-to-head ratio) it is independent of reference to a control group and can also be used in patients whose growth development differs from expectation.

CLINICAL RELEVANCE/APPLICATION
The measurement of fetal body volume supplementary to fetal lung volume may enhance prognostic accuracy in cases of congenital diaphragmatic for individuals whose growth development is restricted.

VSPD21-08 ● Congenital Bronchopulmonary Malformations (BPMs) - Prenatal Sonographic Features with Postnatal Correlations. A Single Institution Experience

Juliette Garel MD (Presenter) ; **Laurent A Garel** MD ; **Dorothee Dal Soglio** MD ; **Francoise F Rypens** MD ; **Chantale Lapierre** MD ; **Josee Dubois** MD ; **Andree Grignon** MD

PURPOSE
BPMs include bronchogenic cysts (BC), bronchial atresias (BA) either isolated or associated with intralobar pulmorary sequestrations (ILPS), congenital pulmonary airways malformations (CPAMs) type I and II, and extralobar pulmonary sequestrations (ELPS) - (Claire Langston classification). Recent literature on congenital lung lesions emphasized the lack of correlations between imaging and pathology. Our purpose is to compare the prenatal sonograms of BPMs and postnatal diagnoses in a single institution cohort.

METHOD AND MATERIALS
Retrospective study over 10 years. Pre and postnatal imaging performed in same radiology department. Prenatal descriptors = timing of conspicuity, lesion echogenicity, macrocysts, vascular connections (systemic feeder, venous return), bronchocele. Postnatal diagnoses based upon pathology (surgical cases) or postnatal CT (non-operated cases).

RESULTS
115 cases, including 56 surgical cases, and 5 upcoming interventions. Postnatal diagnoses = BC (n=5), CPAM (n=33), PS (n=33) including 11 hybrid lesions (coexisting PS and CPAM), trapping (n=32) including 10 BA, suprarenal PS/hybrid (n=12). Non-surgical cases (n=54): suprarenal location (n=12), spontaneous regression (n=17), embolization (n=3), lost to F.U. (n=8), expectant management (n=12), fetal demise (n=2). Prenatal ultrasound and postnatal correlations = all BPMs visible on mid 2nd trimester US; macrocystic BPMs = CPAM type I and II, or hybrid lesions (intrapulmonary BC often considered at pathology as monocystic CPAM type I equivalent); echoic lesions with systemic vascularization = PS; echoic lesions without systemic vascularization = trapping; bronchocele seen in BA.

CONCLUSION
- Conspicuity timing = BPMs always visible on 18-22 WGA sonogram, to the contrary of fetal pulmonary tumors (3 cases in our data bank). - PS almost equally made of ELPS and ILPS (value of color Doppler ultrasound for assessing venous return). - Focal echoic lesions without systemic feeder likely to be trapping (no CPAM type III in our series). Fetal bronchocele very suggestive of BA. Overall, excellent ultrasound pathology correlations, resulting in an improved management (investigations and treatment options) postnatally.

CLINICAL RELEVANCE/APPLICATION
Routine US has resulted in a marked increase in prenatally recognized BPMs. Salient US features allow for a reliable prenatal diagnosis of the various BPMs and for a better management postnatally.

VSPD21-09 ● Pediatric Genitourinary Imaging: Fetal and Neonatal Correlation

Jeanne S Chow MD (Presenter)

LEARNING OBJECTIVES
The purpose of this presentation is to review typical prenatal imaging findings of congenital anomalies of the genitourinary tract, the typical evaluation and appearance of these findings post-natally, and the management of these anomalies

VSPD21-10 ● Radiation Dose Reduction at MDCT for the Prenatal Diagnosis of Skeletal Dysplasia

Chihiro Tani MD (Presenter) ; **Yoshinori Funama** PhD ; **Chikako Fujioka** RT ; **Yukiko Honda** MD ; **Yuko Nakamura** MD ; **Kazuo Awai** MD * ; **Shuji Date** ; **Yoko Kaichi** ; **Daisuke Komoto** MD

PURPOSE
To determine the sufficient minimum radiation dose for the prenatal diagnosis by MDCT of skeletal dysplasia using fetal specimens.

METHOD AND MATERIALS
This study received institutional review board approval for the use of 15 fetal specimens (gestational age: 24 - 36 weeks). The specimens were immersed in 5% formalin in a plastic container that approximated the abdominal circumference of pregnant women. CT scans were acquired with a 64-detector scanner (VCT, GE). The scanning parameters were: tube voltage 100kVp, tube current 600-,300-,150-,100-, and 50mA, rotation time 0.4 sec, pitch 1.375. Images were subjected to adaptive statistical iterative reconstruction (ASiR®, blending rate: 60%). First,we measured fetal dose in 5 specimens using 4 glass dosimeters attached on the surface of fetus, and calculated the mean of the measured dose. Furthermore, we calculated the mean of the measured dose in 5 specimens in each tube current. Then, in each tube current CT scanning of all 15 specimens, image quality was evaluated as follows. In each scan protocol of each specimen, we generated maximum intensity projection and volume rendering images of the fetal skeleton. Two radiologists recorded the visualization of a metatarsal, metacarpal, the 12th rib, fibula, and femoral metaphysis using a visual score where 3=clear, 2=unclear, 1=not visible. We performed statistical analysis of the diagnostic ability of each scan protocol using Steel®s test. Standard image quality was considered obtainable at 600mA.

RESULTS
The fetal exposure dose was 10.2 mGy at a tube current of 600mA, 5.3 at 300mA, 2.5 at 150mA, 1.8 at 100mA, and 0. 9 at 50mA. In visual evaluation of images, without ASiR there was a statistically significant difference between 50- or 100mA images and 600mA images (50mA:p
CONCLUSION
At MDCT for the prenatal diagnosis of skeletal dysplasia, the radiation dose for images acquired with ASiR the fetal radiation dose can be reduced to 1.8mGy.

CLINICAL RELEVANCE/APPLICATION
MDCTscans obtained at 100mA, 100kVp, and ASiR are of sufficient diagnostic quality for the prenatal diagnosis of skeletal dysplasia and their radiation dose is low (1.8 mGy).

VSPD21-11 ● Challenges and Controversies in Imaging Necrotizing Enterocolitis

Charles M Maxfield MD (Presenter)

LEARNING OBJECTIVES
1) Recognize imaging features of necrotizing enterocolitis. 2) Discuss imaging algorithm to the diagnosis and follow-up of necrotizing enterocolitis. 3) Review clinical features and pathophysiology of necrotizing enterocolitis.

VSPD21-12 ● The Superficial Echogenic Lesions Detected in Neonatal Cranial Ultrasonography: A Possible Indicator of Significant Birth Trauma

Byoung Hee Han (Presenter) ; **Sung Bin Park** MD ; **Kyung Sang Lee** ; **Sun Young Ko** ; **Yeon Kyung Lee**

PURPOSE
To evaluate the characteristics and the significance of the superficial echogenic lesions(SEL) in neonatal cranial ultrasonography(US).

METHOD AND MATERIALS
We retrospectively reviewed the clinical records and neuroimaging studies of forty neonates who showed SEL on neonatal cranial US. MRI was taken in 18 of them within 2 weeks after US. We evaluated the location, number, size and follow-up changes of SEL and the associated lesions to know the clinical significance of SEL.

RESULTS
The echogenic lesions were positioned around the sulci in 39 cases and considered as brain parenchymal lesions accompanying with subarachnoid hemorrhage

(SAH). Only in one case, the lesion was positioned intraparenchymally. On US, the locations of the lesions were mainly frontal and parietal in 38 cases and occipitotemporal in 5 cases. The lesions were single in 13 and multiple in 27 cases. The maximal size of the lesions were 5 to 30mm(mean 15mm). There were associated other hemorrhagic lesions in subdural(SDH=12), epidural(EDH=4), intraventricular(IVH=2) location. One SDH was accompanied by skull fracture. Three EDH were combined with skull fractures. Cephalhematoma or caupt succedaneum were noted in 15 cases and five(33.3%) of them were associated with EDH and fracture associated SDH. On follow up study, the SELs evolved and disappeared until 3 months on follow-up US.

CONCLUSION
The SEL in neonatal cranial US involves brain parenchyma and leptomenigeal space. Although SEL itself is usually not significant clinically, it can be one possible indicator of significant birth trauma such as EDH and SDH with skull fracture especially when it combines with cephalhematoma or caput succedaneum.

CLINICAL RELEVANCE/APPLICATION
Cranial ultrasonography can easily detect the superficial echogenic lesions of neonatal brain and if it is found and scalp hematoma is present, MRI should be recommeded to detect intracranial hematoma

VSPD21-13 ● Comparison of Clinical US Measurements of the Ventricles to 3D US Ventricle Volumes in IVH Patients

Jessica E Kishimoto (Presenter) ; **Walter M Romano** MD ; **Aaron Fenster** PhD * ; **David Lee** MD, FRCPC ; **Sandrine De Ribaupierre**

PURPOSE
Premature neonates with intraventricular hemorrhage (IVH) are followed with serial 2D US, head circumference (HC) measurement, as well as clinical examination to determine if they require treatment for hydrocephalus. However, accurate volume measurements are impossible with 2D images, and one relies on ratios and width of ventricles to estimate the changes in ventricular volume. 3D ultrasound (US) has been proven feasible in a clinical setting in this population, and ventricular volumes from those images have been comparable to those made in MRI. Since 2D US and HC measurements have historically been used clinically, we aimed to compare those clinical standard measurements against 3D US ventricular volumes.

METHOD AND MATERIALS
A Philips HDI 5000 US machine with a C8-5 transducer was used for all 2D US exams. 3D US images were acquired, using the same probe, attached to a system that generated 3D images by mechanically moving the transducer. HC measurements were recorded on the days US images were acquired. Five IVH patients were scanned 1-2 times/week for the duration of their stay in the NICU, for a total of 7-11 scans per patient. Total of 47 scans for all patients investigated.
Levene's index (LI), axial horn width (AHW), third ventricle width (3rd) and the thalamo-occipital distance (TOD) were measured on the 2D US images, and ventricle volumes were manually segmented from 3D US images. Pearson correlation between each index and volume as well as the correlations between the change in each index between adjacent time points and corresponding change in volume were performed.

RESULTS
Strong, significant correlations (r>0.80, p Low-moderate correlations (r=0.4-0.1) were found for all correlations comparing the change in volumes and the change in 2D measurements. Change in HC was the lowest of all the correlations (r=0.085).

CONCLUSION
AHW, 3rd and TOD measurements can be predictive of ventricle volumes, but make poor estimates of changes in volumes of IVH patients.

CLINICAL RELEVANCE/APPLICATION
Neither changes in 2D US measurements, nor changes in HC appear to be related to actual ventricle volume changes. This should be taken into account when reviewing standard cranial US exam.

VSPD21-14 ● Doppler Evaluation of Anterior Cerebral Artery in Children on ECMO and Age-matched Controls: Predictive Value in Cerebrovascular Complications

Eman N Alqahtani MBBS (Presenter) ; **Carlos A Zamora** MD, PhD ; **Melania Bembea** ; **Ivor Berkowitz** ; **Kathryn A Carson** ; **Thierry Huisman** MD ; **Aylin Tekes** MD

PURPOSE
Patients on extracorporeal membrane oxygenation (ECMO) are at high risk of cerebrovascular complications (CVC) due to serious underlying diseases, systemic heparinization and sepsis. Our aims were: 1) To evaluate resistive index (RI) measurements in the anterior cerebral artery (ACA) to predict CVC such as intracranial hemorrhage (ICH) and ischemic events in children on ECMO, , 3) To evaluate the differences in RI measurements between children on ECMO and age-matched controls, 3) To evaluate clinical variables to predict CVC.

METHOD AND MATERIALS
The institutional review board approved this study. A retrospective chart review of patients
RESULTS
There were a total of 98 children (ECMO n=36, age matched controls n=62). Nine (25%) of the 36 developed CVC (ICH n=6, ischemia n=3). The difference between baseline and compression RI values and percent change on the first day of ECMO was statistically significantly higher for children with CVC compared to no CVC (p=0.03 and p=0.02, respectively). Median percentage change in the RI value was 5.59% in controls. The median percent change was -20%-78). during the period on ECMO in the no CVC group, while the ICH group showed the widest range of RI percent change until the day of CVC (Fig. 1). Of the clinical variables, only age at initiation of ECMO was statistically significantly associated with increased risk of CVC (p 2 days (p=0.02).

CONCLUSION
Children who had ICH had the widest range of percent RI change during the course of ECMO. Minimal RI change can be reassuring for no CVC in children with ECMO. Children younger than 3 days of age at the time of ECMO cannulation are at higher risk for CVC. These results should be validated in larger prospective studies.

CLINICAL RELEVANCE/APPLICATION
We want to understand the role of cerebral autoregulation in patients on ECMO aiming to predict CVC that affect 30-50% of patients on ECMO.

BOOST: Gynecology-Integrated Science and Practice (ISP) Session

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RO OI OB GU

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Co-Director
Fergus V Coakley , MD
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Bruce G Haffty , MD
Moderator
Nina A Mayr , MD
Moderator
Manjeet Chadha , MD

MSRO25-01 ● Invited Speaker:
Susan A Higgins MD (Presenter)

MSRO25-02 ● A First Report on GYN Permanent Seed Implant with CS-131
Wei Luo (Presenter) ; **Janelle A Molloy** PhD ; **Prakash Aryal** ; **Marcus E Randall** MD

MSRO25-03 ● Serum MicroRNA Expression as Predictive Biomarker of Outcome in Patients with Locally Advanced Cervical Cancer after Chemoradiotherapy

Yoko Harima MD, PhD (Presenter) ; **Koshi Ikeda** MD, PhD ; **Keita Utsunomiya** MD, PhD ; **Atsushi Komemushi** MD, PhD ; **Shohei Kanno** MD ; **Toshiko Shiga** ; **Noboru Tanigawa** MD

PURPOSE
To identify microRNAs (miRNAs) that correlate with clinical outcome in patients with locally advanced cervical cancer after chemoradiotherapy.

METHOD AND MATERIALS
This study included a total of 81 patients with locally advanced squamous cell cervical cancer who underwent definitive chemoradiotherapy between February 2006 and September 2011. We compared the expression level of miRNAs in 45 no evidence of disease [NED] and 36 cancer-caused death [CD] patient's serum before treatment using miRCURY LNA ™ Universal RT microRNA PCR. The amplification was performed in a LightCycler® 480 Real-Time PCR System

(Roche) in 384 well plates. The raw data was extracted from the Lightcycler 480 software. Data was internally calibrated by UniSp3 IPC using GenEx software (ver.5). The significance of the expression differences between the NED group and the CD group was evaluated using t-test. The endpoint was correlation between patient characteristics and disease-free and overall survival rates determined by multivariate Cox proportional-hazard model analysis.

RESULTS
Among 384 miRNAs analyzed, miR-214* was most significantly overexpressed in the NED group than in the CD group (p=0.03), whereas miR-493* was most significantly overexpressed in the CD group than in the NED group (p=0.03). The results of multivariate analysis showed that miR-214* is a significant predictor of disease-free survival [RR=2.01, p=0.03], while miR-493* is a significant predictor of poor overall survival [RR=1.32, p=0.02].

CONCLUSION
Two miRNAs identified in this study, miR-214* and miR-439* can be used as prognostic biomarker to improve clinical strategies for treatment of locally advanced cervical cancer after chemoradiotherapy.

CLINICAL RELEVANCE/APPLICATION
Two miRNAs identified in this study, miR-214* and miR-439* can be used as prognostic biomarker to improve clinical strategies for treatment of advanced cervical cancer after chemoradiotherapy.

MSRO25-04 ● Stepwise Implementation of Imaging Changes for Cervical Cancer Brachytherapy Planning Using Existing Infrastructure: A Multidisciplinary Approach to Advancing Patient Care

Theodora A Koulis MD (Presenter) ; **Derek W Brown** ; **Deepak Bhayana** MD ; **Laurel Traptow** ; **Karen Long** ; **Maree Patrick** ; **Gregg Nelson** ; **Peter Craighead** ; **Corinne Doll** ; **Tien Phan** MD

ABSTRACT
Purpose/Objective(s): In 2005 the GEC-ESTRO group published recommendations on 3D planning for cervical cancer brachytherapy (BT) using MR image guidance as the new standard of care. There are many resource and infrastructure constraints that can hinder the mainstream implementation of new technologies. The objectives of this report are to describe the process of transition from 2D to 3D-based planning for cervical cancer BT at our centre, to highlight some of the challenges we encountered, and to describe the solutions and process maps that we developed.
Materials/Methods: A step-wise method was devised to transition from orthogonal x-ray (2D) planning to 3D-based planning of cervical cancer BT using existing infrastructure. First we identified the departments and personnel that would be affected by this change in practice and formed a working group consisting of radiation oncologists, gynaecologic oncologists, medical physicists, RT treatment planners, nursing staff, a radiologist, RT manager, and simulator staff. Possible challenges and strategies were mapped out in a CT-HDR Prospective Risk Analysis. After review and approval from all members of the group, an in-house, ethics-approved protocol was developed: both 2D images and CT images were acquired with the BT apparatus in situ. Feedback was monitored and updates were made to the process map to improve safety and efficiency. An MR-HDR Prospective Risk Analysis was then developed focusing on the logistics of patient transfer from the OR to MR department and subsequent BT treatment. Phantom studies were performed to ensure equipment safety and appropriateness of scanning protocols.
Results: Starting in April 2009, 5 patients were treated on the study protocol. Subsequent patients were planned with CT, but concurrent x-ray images provided verification for dose calculations. Since November 2010, CT-based planning has been used exclusively. Transition to MR-based planning began in February 2012. In August 2012, a "dry-run" of the MRI process map was undertaken before proceeding with our first MRI-guided BT patient in September 2012. Currently a combination of MRI and CT images are used for planning.
Conclusions: Using a stepwise approach it is possible to implement a 3D-based cervical cancer BT planning program utilizing resources of existing infrastructure. Achieving the recommended guidelines requires a multidisciplinary approach, and appropriate prospective risk analysis. Our program is still under development, but our experiences thus far may serve as a reference tool for other centres that are considering a switch to 3D-based planning of cervical cancer BT.

MSRO25-05 ● Does “A? of Point A Mean to Be Avoided in Image Guided Brachytherapy?
Zhanrong Gao ; **Yana Goldberg** (Presenter) ; **James R Wong** MD ; **Mei Li** MS ; **J. Emmolo** ; **Paul Heller** ; **D. Tobias** ; **N. Tchabo** ; **B. Slomovitz**

MSRO25-06 ● A Preliminary Data on Image Based Intracavitary Brachytherapy for Cervical Cancer: Point A Plan and CTV Based Plan

Joanna Athel Embestro-Rodriguez MD (Presenter) ; **Jake John Galingana** MSc ; **Anthony Albert Abad** MD ; **Lilian B Rodriguez** MSc ; **Miriam Joy Calaguas** ; **Teodoro Ramos** RT

ABSTRACT
Purpose/Objective(s):
The main objectives of this study are to determine the three dimensional dose volume parameters for a Point A plan and a CTV-based plan and to compare these values using statistical tools.
Materials/Methods:
A total of 22 cases of cervical cancer who were subjected to CT-based Intracavitary Brachytherapy were enrolled in this retrospective study. After the DICOM files were loaded, the critical organs (i.e. bladder and rectum) and target volume were delineated. Treatment planning was undertaken using 2 methods: (1) Manchester of Patterson and Parker and (2) optimization of radiation dose to assigned calculation points which highly depends on the target volume. A prescribed dose of 7 Gy was used for the two methods. 44 plans were generated using the Oncentra version 4 treatment planning system. Patients were divided according to the total volume of the CTV. Patients with CTV less than or equal to 100 cm3 were assigned as Group 1, those with more than 100 cm3 were assigned as Group 2. The following 3D dose volume parameters were determined using relative and absolute values from graph of the plotted DVH: Coverage Index, V100 of the CTV, D90 of the CTV and D2cc of the bladder and rectum.
Results:
With regards to the dose volume parameters evaluated in this study, all mean values generated from all cases were higher when CTV based planning was done rather than Point A based planning. But the results generated were only significant for those that belong in Group 2 or those having a large CTV (> 100cm3). This shows a better coverage of the target volume in terms of the D90, V100 and Coverage Index which can be correlated with an increase in terms of the success of treatment outcome for the CTV based planning. But for the organs at risk, namely the bladder and rectum, having higher radiation doses can result to increase risk of early and late complications
Conclusions: The evidence of this study showed that CTV based treatment planning has more advantage compared to Point A planning if implemented in a CT-based brachytherapy because the method depends highly on the anatomy of the patient (i.e. patient specific). But the organs at risk must be considered in the evaluation of the plan because of the tendency of over dosing the bladder and rectum specially when dealing with a large cervix (> 100cm3). Thus, the dose to the target volume and organs at risk must be noted and be optimized to be able to meet the goals of brachytherapy treatment.

MSRO25-07 ● Treatment Outcome and Prognostic Factors of Concurrent Chemoradiotherapy with Nedaplatin for FIGO Stage IB-IVA Carcinoma of the Cervix Uteri

Fujiwara Masateru MD (Presenter) ; **Isohashi Fumiaki** ; **Yoshioka Yasuo** ; **Mabuchi Seiji** ; **Kimura Tadashi** ; **Ogawa Kazuhiko**

PURPOSE
Concurrent chemoradiotherapy (CCRT) with cisplatin is, at present, a common method of treatments for carcinoma of the cervix uteri, but CCRT with nedaplatin is uncommon. The purpose of this retrospective study was to evaluate the efficacy and safety of CCRT with nedaplatin and analyze prognostic factors for survival among patients with FIGO stage IB-IVA carcinoma of the cervix uteri.

METHOD AND MATERIALS
We retrospectively reviewed the medical records of 55 patients with FIGO stage IB-IVA carcinoma of the cervix uteri treated with CCRT using nedaplatin 35 mg / m ^{2} weekly from 2000 and 2009. The treatment consisted of external beam radiotherapy 46.5-66 Gy (in 24-33 fractions) followed by 13.6-28.8 Gy (in 2-4 fractions) of high-dose-rate intracavitary brachytherapy (ICBT) or 34-35 Gy (in 4 fractions) of medium-dose-rate ICBT. Overall survival (OS) and progression-free survival (PFS) were estimated by the Kaplan-Meier method. The Cox proportional hazard model was used for multivariate analysis. Acute and late toxicities were evaluated by CTCAE ver.4.

RESULTS
The median follow-up was 48 months (range 3-121 months). The median age was 62 years old (range 25-73 years old). The 5-year OS and PFS were 78.9 and 55.6 %, respectively. The 5-year local control was 71.6 %. Multivariate analysis showed that histologic type (adenoma / squamous cell carcinoma), regional lymph node metastases, maximum diameter of the tumor and pretreatment hemoglobin level were independent risk factors for PFS, (hazard ratio (HR) 3.40, 95% confidence interval (95%CI)1.03-9.81), (HR 2.89, 95%CI 1.12-7.72), (HR 1.42, 95%CI 1.11-1.79) and (HR 0.63, 95%CI 0.46-0.85), respectively. In terms of adverse effects, 27 patients (49.1 %) had acute grade 3-4 leukopenia. Seven patients (12.7 %) had late grade 3 intestinal complications. There was no renal toxicity during CCRT.

CONCLUSION
Our data showed that the CCRT with nedaplatin for FIGO stage IB-IVA carcinoma of the cervix uteri was efficacious and safe, especially in view of less renal toxicity. Histologic type, lymph node metastases, maximum diameter of tumor and pretreatment hemoglobin level were statistically significant prognostic factors.

CLINICAL RELEVANCE/APPLICATION
Chemoradiotherapy with nedaplatin for carcinoma of the cervix uteri was efficacious and safe, especially in view of less renal toxicity.

MSRO25-08 ● Single vs. Individual Vaginal Cuff Brachytherapy Planning. Rectal Dose Results from a Rigid/Deformable Registration

Sebastia Sabater (Presenter) ; **Ignacio Andres** ; **Sevillano M Mar** ; **Roberto Berenguer** ; **Santiago Machin-Hamalainen** ; **Meritxell Arenas**

ABSTRACT
Purpose: Debate exists about the need of a CT plan for every fraction vs. the use only the first fraction plan for the overall treatment. Our aim was to investigate the relevance of individual CT-based planning for high-dose rate vaginal cylinder brachytherapy vs. a single fraction CT-based planning using rigid/deformable registration and dose warping.
Materials and methods: Ten patients underwent 5 CT-studies, before each vaginal cylinder brachytherapy fraction. All images were re-segmented and re-planed under the same parameters. Rigid and bspline registration were carried out using the first CT-study as the fixed set, and doses were warped. Three dose accumulation scenarios were studied: (1) multiplying the treatment plan metrics and the number of fractions; (2) summing the first dose fraction with the rigid warped doses; (3) summing the first dose fraction with the deformed doses. Each scenario was evaluated for 3 and 5 fractions. Dose volume histogram (DVH) metrics (mean dose, D0.1cc, D1cc, D2cc and D5cc) of rectum were collected and compared according to the dose accumulation scenario. To study if the number of fractions could have an impact the DVH metrics were re-escaled to maximum dose and normalized to the overall treatment dose. Paired non-parametrical tests were performed (Friedman and Wilcoxon signed-rank test).
Results: Median values and the variation percentage related to the multiplying scenario are shown in table 1a. Dose metric values and median percentage variation were small (table 1a).Non significant differences were seen according to the number of fractions and type of registration, after normalization to the overall dose (table 1b).

A							B	Normalized doses (%)	
		Median			%				
		Multiply	Rigid	Deformable	Rigid	Deformable		Rigid	Deformable
3fx	DMean	0,81	0,85	0,77	6,51	7,70		5,64	5,12
	D0.1	5,12	5,50	5,16	-4,48	0,35		36,63	34,37
	D1	4,13	4,17	4,16	-2,05	0,68		27,77	27,70
	D2	3,74	3,69	3,71	-1,80	0,80		24,57	24,70
	D5	3,02	2,96	3,025	-0,66	2,00		19,70	20,17
5fx	DMean	1,34	1,42	1,43	2,35	7,05		5,66	5,70
	D0.1	8,53	9,45	8,94	13,26	-0,11		37,78	35,74
	D1	6,88	7,11	7,29	-6,69	2,45		28,42	29,14
	D2	6,23	6,45	6,48	-4,26	2,64		25,80	25,90
	D5	5,03	4,82	5,08	-1,77	1,41		19,26	20,30

Conclusions: Data show small and non significant differences on rectal DVH metrics using rigid/deformable registration and dose warp compared to the simple dose multiplication; nevertheless they could be irrelevant from a clinical point of view.

Case-based Review of Magnetic Resonance: Woman's Imaging (An Interactive Session)

Monday, 01:30 PM - 03:00 PM • S100AB

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MR OB GU BR

MSCM23 • *AMA PRA Category 1 Credit* ™:1.5 • ARRT Category A+ Credit:1.5

Director
John R Leyendecker , MD

MSCM23A • Breast

Constance D Lehman MD, PhD (Presenter) *

LEARNING OBJECTIVES
1) Improve approach to image interpretation of challenging breast MRIs. 2) Improve approach to management of patients with abnormal MRIs. 3) Interpret a variety of MR lesions using the new BI-RADS lexicon.

ABSTRACT

MSCM23B • Fetal/Placental MRI

Keyanoosh Hosseinzadeh MD (Presenter) *

LEARNING OBJECTIVES
1) To describe common indications for referral for fetal MRI of the central nervous system, neck and oral cavity. 2) To describe MRI technique and algorithmic approach for the above indications. 3) To describe the MRI appearance of the placenta, with emphasis on abnormal placentation.

MSCM23C • Malignancies of the Female Pelvis

John A Spencer MD (Presenter)

LEARNING OBJECTIVES
Ovarian cancer continues to present at advanced stage of disease.
1) Typical imaging features of ovarian cancer at presentation. 2) Mimics of disseminated ovarian cancer. 3) The role of image guided biopsy in management. Endometrial cancer, now the most common female genital tract malignancy, usually presents in the post-menopausal woman with vaginal bleeding. 4) How to establish deep myometrial invasion and cervical involvement which may modify the surgical approach Cervical cancer is reducing in incidence in the developed world but still a major killer of young women in the developing world.
5) How to use MR imaging as a staging examination that replaces examination under anaesthetic (EUA). 6) The emerging role of CT-PET in management.

ABSTRACT
Ovarian cancer continues to present at advanced stage of disease with peritoneal carcinomatosis (PC). The role of imaging is in determining the cause of PC. If this is felt to result from ovarian cancer the next question is if the extent and sites of disseminated tumour preclude effective cytoreductive surgery. For women beyond this scope or unfit for surgery the management is with primary (neoadjuvant) chemotherapy and the key is to obtain a histological diagnosis. We will first cover: 1. typical imaging features of ovarian cancer at presentation 2. mimics of disseminated ovarian cancer 3. the role of image guided biopsy in management Endometrial cancer, now the most common female genital tract malignancy, usually presents in the post-menopausal woman with vaginal bleeding. Its incidence has increased with obesity in the Western world and to a lesser extent from oestrogenic medications including tamoxifen therapy for breast cancer. Because of the worrying nature of this bleeding most women present early with superficial disease cured by hysterectomy. Deep myometrial invasion increases the risk of lymph node metastases and indicates the need for lymphadenectomy. We will cover: 4. how to establish deep myometrial invasion and cervical involvement which may modify the surgical approach Cervical cancer is reducing in incidence in the developed world but still a major

killer of young women in the developing world. Until 2009 the FIGO staging did not include information from MR imaging. Nowadays MR imaging provides the primary staging information with CT-PET considered for all tumours of stage IB2 and above i.e. those confined to the cervix of > 4 cm size and those having breached the cervix. We will cover: 5. how to use MR imaging as a staging examination that replaces examination under anaesthetic (EUA). 6. the emerging role of CT-PET in management. A case-based teaching approach will be used.

BOOST: Gynecology-Case-based Review (An Interactive Session)

Monday, 03:00 PM - 04:15 PM • S103CD

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RO OI OB GU

MSRO26 • *AMA PRA Category 1 Credit* ™:1.25 • ARRT Category A+ Credit:1.5

Co-Director
Fergus V Coakley , MD
Co-Director
Bruce G Haffty , MD
Moderator
Beth A Erickson , MD
William Small , MD
Julian C Schink , MD
Susan A Higgins , MD
Daniel Cornfeld , MD
Joseph H Yacoub , MD *

LEARNING OBJECTIVES
1) Present the multidisciplinary management of gyneocolgic cancers including surgery, radiation and chemotherapy. 2) Highlight the importance of diagnostic imaging before, during and after treatment. 3) Highlight the importance of imaging in the planning and delivery of radiation.
ABSTRACT
The care of patients with gyneocologic cancers requires the collaboration of imaging specialists as well as gynecologic and radiation oncologists. Patterns of disease spread and recurrence have tremendous impact on the managment of these patients, and diagnostic imaging is key in defining disease at diagnosis and following patients for detection of recurrence after treatment. Image-guided radiation is considered the standard of care for both the planning of external beam and brachytherapy and is key in maximizing the benefits of radiation while minimizing the risks. Case examples of the pivotal imapct of imaging and its importance in multidisiplinary care will be highlighted in this session.

Controversy Session: Fibroid Therapy: UAE vs Focused US

Tuesday, 07:15 AM - 08:15 AM • E350

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US IR OB GU

SPSC30 • *AMA PRA Category 1 Credit* ™:1 • ARRT Category A+ Credit:1

Moderator
Brian S Funaki , MD
James B Spies , MD
Alan H Matsumoto , MD *

LEARNING OBJECTIVES
1) Describe role of uterine artery embolization in the treatment of symptomatic uterine fibroids. 2) Explain the use of high-intensity focused ultrasound (HIFU) in treatment of uterine fibroids. 3) Describe one pitfall of HIFU in treatment of uterine fibroids.

Second and Third Trimester Obstetrical Ultrasound

Tuesday, 08:30 AM - 10:00 AM • S405AB

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US OB GU

RC310 • *AMA PRA Category 1 Credit* ™:1.5 • ARRT Category A+ Credit:1.5

RC310A • Support Structures

Vickie A Feldstein MD (Presenter)

LEARNING OBJECTIVES
1) Understand normal development and anatomy of the placenta and umbilical cord. 2) Optimize sonographic techniques for correct assessment of the placenta and cord. 3) Enhance knowledge of common and clinically important abnormalities of the placenta and cord to improve skills for accurate detection by ultrasound. 4) Recognize abnormal placentation, detect placenta accreta, placenta previa, and vasa previa in effort to optimize clinical care and management.

ABSTRACT
Normal placental and umbilical cord development and anatomy will be reviewed. Sonographic manifestations of common abnormalities of the placenta and cord will be presented. Ultrasound (US) findings will be demonstrated, highlighted with pathologic correlation. Attention to the placenta, an often-overlooked crucial structure, is important in the optimal performance and interpretation of 2nd and 3rd trimester obstetrical US. Placental thickness, morphology and echotexture will be addressed. Retroplacental hematomas, which may present clinically as abruption, pose risk to the fetus and impact management. Placenta previa, a placenta that overlies or is proximate to the internal cervical os, is the most common cause of bleeding in the 3rd trimester. US detection and suggested terminology regarding previa will be reviewed. Vasa previa is a rare, but clinically important condition related to placenta previa in which umbilical cord and/or fetal vessels are positioned between the presenting fetal part and cervix. Possible consequences of this condition, including hemorrhage and potential fetal exsanguination, are devastating. Improved outcomes depend upon accurate prenatal diagnosis and delivery by cesarean section. Placenta accreta refers to abnormal adherence of the placenta to the uterus with subsequent failure to separate after delivery of the fetus. Careful assessment of at-risk pregnancies is indicated as this condition may lead to massive obstetric hemorrhage. Prenatal diagnosis allows effective delivery management planning to minimize morbidity. Umbilical cord abnormalities can be found and have clinical implications. The most common abnormality of the cord is a single umbilical artery (SUA). Discovery of SUA prompts a search for any other detectable fetal malformation. Velamentous cord insertion, with attachment of the cord beyond the placental edge into the free membranes of the placenta, is associated with increased risk and this too can be detected by US.

RC310B • Fetal Genitourinary Anomalies

Roya Sohaey MD (Presenter) *

LEARNING OBJECTIVES
1) Recognize the appearance of the normal fetal adrenal gland, kidney, bladder and genitalia in the first, second and third trimester. Anomalies of these structures will be shown and strategies for making accurate diagnoses of anomalies will be taught. 2) Current in utero and post natal treatment plans for fetal genitourinary anomalies will be discussed, particularly for prenatal and postnatal workup and evaluation of fetal hydronephrosis. The Society of Fetal Urologists grading system of hydronephrosis will be reviewed and it's utility in clinical practice discussed.

ABSTRACT
Genitourinary (GU) abnormalities are common in fetal life and range in severity from idiopathic, as in most cases of pelviectasis, to lethal, as in renal agenesis. A systematic approach to evaluation of the GU tract is important in order to make an accurate diagnosis. The fetal kidneys should be documented in two orthogonal planes. The adrenal gland can mimic the kidney if only the axial plane is obtained. The fetal bladder should be seen filling and emptying during the study. The adrenal glands are often easily identified and the fetal genitalia should be assessed whenever GU anomalies are seen. The approach to the abnormal urinary tract starts with identifiying both kidneys and evaluating renal echogenicity and morphology. If hydronephrosis is present then quantitative and qualitative assessment of the whole collecting system, from calyces to urethra is performed. The anterior-posterior renal pelvis is measured and the SFU grade of hydronephrosis is estimated. If renal cysts are present then the differential diagnosis of multicystic dysplastic kidney vs renal cystic dysplasia (either primary or secondary) is explored. An abnormal fetal bladder is one which is either consistently 'too small' or 'too large', and the cause can be anatomic or physiologic. Adrenal masses can occur in utero or more often, the adrenal gland may be displaced by a suprarenal mass that is not adrenal in origin, such as an extralobar pulmonary sequestration. Congenital adrenal hyperplasia presents as enlarged adrenal glands and is associated with ambiguous genitalia in female fetuses. Genitalia anomalies can be isolated or associated with syndromes and aneuploidy. Making an accurate diagnosis of fetal GU anomalies results in better prenatal counseling and post natal treatment. Some fetuses with GU anomalies may benefit from in utero intervention as well, such as bladder drainage. Most need prenatal and postnatal surveillance which is often determined by the prenatal findings.

RC310C • Multiple Gestations

Anne M Kennedy MD (Presenter)

LEARNING OBJECTIVES
1) Determine chorionicity and amnionicity and understand why it is important to do so in all multiple gestations. 2) Understand and diagnose specific complications of monochorionic twinning such as twin to twin transfusion syndrome and twin reversed arterial perfusion. 3) Recognize the indications for more frequent surveillance and intervention in complicated twin pregnancies.

ABSTRACT
The prognosis in multiple gestations is dependent on chorionicity therefore it is essential that this be documented in all cases. The easiest time to do this is in the first trimester but we will review tips for diagnosis in the second and third trimesters as well. Specific complications of monochorionic twinning include twin to twin transfusion syndrome (TTTS) in which there is an arteriovenous shunt from the donor twin to the recipient. The donor is oligemic and the recipient is hypovolemic thus there is oligohydramnios in the donor sac and polyhydramnios in the recipient sac. Untreated the outcome is poor but laser ablation of the vascular connections in the placenta has markedly improved prognosis. In twin reversed arterial perfusion (TRAP) there is an artery to artery anastomosis between the pump twin and the malformed co-twin which can become very large. It is important to recognize TRAP sequence early in pregnancy as the abnormalities in the malformed twin are lethal. The pump twin is at risk for hydrops due to the high output state. Early intervention prevents continued growth of the abnormal twin and protects the pump twin such that the patient has a good prognosis for one live birth. Multiple gestations are at risk for growth restriction and discordant growth; the incidence of fetal anomalies and maternal complications of pregnancy is also increased. Because of this multiple gestations are followed more intensively that singletons and, when monochorionic, surveillance for specific complications is increased. The prognosis for TTTS and TRAP is much improved with intervention but there is finite window of opportunity in which interventional procedures can be performed thus appropriate referral is essential. Accurate diagnosis of chorionicity and early recognition of complications in multiple gestations will result in better managment and improved outcomes.

Genitourinary (Imaging of Pregnancy and Its Complications)

Tuesday, 03:00 PM - 04:00 PM • E351

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MR OB GU

SSJ11 • *AMA PRA Category 1 Credit* ™:1 • ARRT Category A+ Credit:1
Moderator
Mary C Frates , MD
Moderator
Vikram S Dogra , MD *

SSJ11-01 • Presence of a Chorionic Bump May Not Be Associated with a Guarded Prognosis

Elizabeth K Arleo MD (Presenter) ; **Robert N Troiano** MD

PURPOSE
To prospectively observe the pregnancy outcome of patients with the sonographic finding of a chorionic 'bump,' an irregular, convex bulge from the choriodecidual surface into the first-trimester gestational sac.

METHOD AND MATERIALS
Study design: prospective observational study. Number of patients: N = 53. Time period: 3 years (2004-2007). Primary endpoint: Live birth rate. Secondary endpoints included: chorionic bump size. Statistics: Fisher exact test of proportions.

RESULTS
13% (7/53) of the pregnancies with chorionic bump on first-trimester ultrasound were anembryonic. Of the remaining 46 embryonic pregnancies with first-trimester chorionic bumps, 74% (34/46) resulted in live births, all at term with the exception of one set of twins and one set of triplets, who were electively delivered early at 35 weeks and 32 weeks, respectively. There was only one associated anatomic anomaly, a left forearm limb reduction defect diagnosed antenatally in one case. Bump size was not correlated with pregnancy outcome. In most patients, the bump was avascular, but in two cases slow intraluminal flow was noted.

CONCLUSION
The presence of a chorionic bump on first trimester ultrasound is not necessarily a poor prognostic indicator. The likelihood of subsequent first-trimester survival is significantly higher if an embryo is seen at the time of chorionic bump diagnosis. In such a scenario, in this series, the largest to date of such a cohort, the live birth rate (74%) was significantly higher than previously reported in smaller series (live birth rate
CLINICAL RELEVANCE/APPLICATION
This largest series on chorionic bumps demonstrates that this US finding is not necessarily a poor prognostic indicator and therefore, interpreting radiologists should recommend close interval followup.

SSJ11-02 • Brand-new MRI Finding as Predictor of Placental Invasion: Evaluation of 64 Patients with Clinical and Histopathological Correlation

Yoshiko Ueno (Presenter) ; **Kazuhiro Kitajima** MD ; **Tetsuo Maeda** ; **Yuko Suenaga** ; **Satoru Takahashi** MD ; **Kazuro Sugimura** MD, PhD *

PURPOSE
To identify new MR criteria and review established MR criteria for the diagnosis of placental invasion.

METHOD AND MATERIALS
A retrospective review of prenatal MR scans of 64 patients (mean age, 34years) who underwent MR examination for suspected placental invasion by prenatal sonogram was performed. All MRI examinations were performed on a 1.5-T unit with body array coils, including axial, coronal, and sagittal T2 half-Fourier single-shot turbo spin echo imaging and/or a T2 true fast imaging with steady-state precession sequence. According to surgical and/or pathological findings, 14 patients were diagnosed with placenta accreta, placenta increta, or placenta percreta, and 50 were without placental invasion. Two experienced radiologists who were blinded to the pathology and surgery findings reviewed the MRI and evaluated a total of eight MRI features of placenta, including our new finding; the presence of placental protrusion into internal os. Interrater reliability was assessed using kappa statistics. The features with a kappa statistics >0.40 were evaluated to compare the capabilities for placental invasion assessment with a multivariable logistic regression analysis.

RESULTS
Intraplacental T2 dark bands, Intraplacental abnormal vascularity, uterine bulging, total placental previa, partial placental previa and placental protrusion into internal os had moderate or better interobserver reliability. Using multivariable logistic regression analysis, we found that the findings of intraplacental abnormal vascularity (A) and placental protrusion into internal os (B) had significant odds ratios of an increased risk of placental invasion. (A: odds ratio, 82.7; 95% CI, 4.1 to 5942; p=0.002, B: odds ratio, 83.1; 95% CI, 3.61 to 6329; p=0.0047)

CONCLUSION
In this study, the findings of intraplacental abnormal vascularity and protrusion of placenta into the internal os were good predictors of placental invasion.

CLINICAL RELEVANCE/APPLICATION
This study showed that the presence of placental protrusion into internal os is new useful MRI finding for the diagnosis of invasive placentation.

SSJ11-03 • Outcome of Cesarean Scar Implantation Pregnancies Diagnosed Sonographically in the First Trimester

Aya Michaels MD (Presenter) ; **Erin Washburn** MD ; **Katherine Pocius** MD ; **Carol B Benson** MD ; **Peter M Doubilet** MD, PhD ; **Daniela Carusi** MD

PURPOSE
To determine the outcome of cesarean scar implantation pregnancies diagnosed during the first trimester.

METHOD AND MATERIALS
We retrospectively identified all cesarean scar implantation pregnancies diagnosed by ultrasound prior to 14 weeks between 2000 and 2012 at our institution. We reviewed the patients' sonographic images and medical records, and recorded information about sonographic findings and pregnancy outcome.

RESULTS
37 cases met study entry criteria. Gestational age (GA) at diagnosis was 6.8 ± 1.6 weeks (mean ± SD). Anterior myometrial thickness overlying the gestational sac was 2.7 ± 2.2 mm. 11 patients had no embryonic cardiac activity at the time of diagnosis or thereafter, 6 of whom underwent ultrasound-guided DandC or were given systemic methotrexate. Of these 11, only 1 required hysterectomy, which occurred a month after initial diagnosis for persistent bleeding. Among the 26 patients with embryonic cardiac activity, 9 continued the pregnancy, 2 required emergent hysterectomy for dehiscence at the time of diagnosis (GA 10 and 11 weeks), and 15 underwent interruption of the pregnancy during the first trimester by one of several methods: intrasac KCl injection (8 cases); ultrasound-guided DandC (6 cases); laparascopic resection (1 case). None of the latter 15 interrupted cases subsequently required

hysterectomy. Of the 9 uninterrupted pregnancies, 3 had miscarriages (GA 9, 9, and 20 weeks) and 6 had liveborn deliveries, of whom 4 had placenta accreta, 3 requiring hysterectomy.

CONCLUSION
In a woman with a cesarean scar implantation pregnancy and embryonic cardiac activity, allowing the pregnancy to proceed has high risk of subsequent miscarriage (33%). Those pregnancies that continue to delivery of a liveborn infant are at substantial risk of placenta accreta (66%) requiring hysterectomy (50%).

CLINICAL RELEVANCE/APPLICATION
Cesarean scar implantation pregnancies, if untreated, are at high risk for miscarriage and/or serious complications, including uterine dehiscence and placenta accreta requiring hysterectomy.

SSJ11-04 ● Placental MR Imaging in Fetuses with Placental Insufficiency

Yoshimitsu Ohgiya MD (Presenter) ; **Hiroshi Nobusawa** MD, PhD ; **Noritaka Seino** ; **Jumpei Suyama** MD, PhD ; **Masanori Hirose** MD ; **Takehiko Gokan** MD

PURPOSE
To evaluate morphologic and signal intensity (SI) changes of placental insufficiency on MRI and to assess value of morphologic changes and decreased flow voids (FVs) on T2-weighted RARE imaging for diagnosing placental insufficiency.

METHOD AND MATERIALS
Fifty singleton fetuses with abnormal findings at US underwent MRI that included T2-weighted half-Fourier RARE imaging and T1-weighted FLASH imaging using a 1.5 T MR scanner. Placental insufficiency was diagnosed if fetal weight estimated with US was below the 5th percentile. Histopathologic examinations were available in all placentas. Placental thicknesses, placental areas, placental volumes, placental SI, and amniotic fluid SI were measured on MR images. Two radiologists reviewed T2-weighted RARE images for globular appearances of the placentas and FVs between the uterus and the placenta. A thickened appearance or no tapering edges of the placenta was diagnosed as positive signs of a globular appearance. None or decreased size and number of FVs between the uterus and the placenta was diagnosed as positive signs of decreased FVs. The t tests and McNemar's tests were used at 5% levels of significance.

RESULTS
Twenty-five of the 50 pregnancies were categorized as having an insufficient placenta. The mean placental thicknesses with placental insufficiency were larger than that without placental insufficiency ($p < 0.01$). The mean placental areas and the mean placenta to amniotic fluid signal intensity ratio (SIR) with placental insufficiency were smaller than those without placental insufficiency ($p < 0.01$). There was no significant difference in placental volumes. The sensitivity, specificity, and accuracy were as follows; 76.0%, 80.0%, and 78.0% with globular appearances, 52.0%, 88.0%, and 70.0% with decreased FVs, 88.0%, 76.0%, and 82.0% with globular appearances plus decreased FVs. There is a significant difference in sensitivity between decreased FVs and globular appearances plus decreased FVs.

CONCLUSION
Placental insufficiency is associated with placental areas, placental thicknesses, and placenta to amniotic fluid SIR. Evaluating FVs on T2-weighted RARE images can be useful for detecting placental insufficiency, particularly in placentas without globular appearances on MRI.

CLINICAL RELEVANCE/APPLICATION
T2-weighted RARE imaging can demonstrate morphologic changes of the placentas and decreased flow voids between the uterus and the placenta in placental insufficiency.

SSJ11-05 ● Adnexal Masses during Pregnancy: MR Imaging Characterization Using ADNEX MR Score

Isabelle Thomassin-Naggara MD (Presenter) ; **Marie-Claude Chevrier** MD ; **Lamia Jarboui** MD ; **Audrey Morel** MD ; **Sophie Dechoux** ; **Marc J Bazot** MD

PURPOSE
To retrospectively evaluate the accuracy of pelvic magnetic resonance (MR) imaging performed to characterize indeterminate sonographic adnexal masses during pregnancy and to test the accuracy and the reproducibility of the ADNEXMR score in this population.

METHOD AND MATERIALS
Institutional ethics committee approved the study and granted a waiver of informed consent. Our study population comprised 31 pregnant women (mean age : 32 (19-42) with a mean gestational age at the diagnosis of 16 weeks (16-26) who underwent MR imaging for characterization of indeterminate adnexal masses in our center. Two radiologists with 1 and 10 years experience retrospectively evaluated MR criteria for characterization of complex adnexal masses and ADNEXMR score was tested using ROC curve analysis and Kappa values. The reference standard was surgical pathology or at least a one-year imaging follow-up.

RESULTS

CONCLUSION
During pregnancy, MR imaging is an accurate tool to differentiate benign form malignant adnexal masses without any cancer missed. ADNEXMR score is as accurate and reproducible as in general population. Thus, our study suggests its potential to improve patient management. Larger multicenter prospective validation of the score is warranted.

CLINICAL RELEVANCE/APPLICATION
MR imaging is highly accurate to characterize adnexal masses during pregnancy and may be helpful to determine the risk with the patient to opt for the absence of surgery specifically until childbirth.

SSJ11-06 ● Improving the Clinical Utility and Consistency of Placental MRI Reports: Introduction of a Novel Placental MRI Grading Scale to Assign a Confidence Score in Diagnosing Abnormal Placental Implantation

Angela Trinh MD (Presenter) ; **Jeanne M Horowitz** MD ; **Senta M Berggruen** MD ; **Helena Gabriel** MD ; **Adrienne Vargo** MD ; **Frank H Miller** MD

PURPOSE
To assess feasibility of a novel MRI grading scale using major and minor imaging criteria to assign confidence in diagnosing abnormal placental implantation (API), and improve the accuracy, consistency, and clinical utility of placental MRI.

METHOD AND MATERIALS
Two board certified radiologists blinded to all reports independently, retrospectively reviewed 20 randomized placental MRI exams (10 with API by surgery and/or pathology and 10 negative cases). Assessment was made for major and minor diagnostic criteria of API, based on MRI signs reported in literature. Major criteria included placental invasion outside the uterus, intraplacental bands, uterine bulging, very heterogeneous placenta, and bladder tenting. Minor criteria included mild/moderately heterogeneous placenta, tortuous flow voids, focal interruption of the myometrial wall and myometrial thinning. Confidence levels (CL) were assigned for the diagnosis of any level of API, including placental accreta, increta, and percreta. CL were: 90% confidence for cases with 2 or more major criteria, 75% confidence with either 1 major criterion or all 4 minor criteria, 50% confidence with 3 minor criteria, 25% confidence with 1-2 minor criteria and 10% confidence if no criteria met.

RESULTS
Between the two radiologists, there was complete agreement on 12 of 20 cases based on CL. 6 cases demonstrated a difference of only one CL. 2 cases demonstrated complete disagreement. When grouping the 90% and 75% CL into high suspicion and the 25% and 10% CL into low suspicion of API, the radiologists agreed on 18 of 20 cases. Of these 18 cases, 7 were high suspicion and 11 were low suspicion. The 7 high suspicion cases and 9 of the 11 low suspicion cases matched the surgical/pathology results. 2 of the 11 low suspicion cases were positive for placenta accreta. This resulted in a sensitivity of 0.7-0.89 and specificity of 0.91-1.0 for detection of API between the radiologists. Accuracy ranged from 0.85-0.91.

CONCLUSION
Utilizing major and minor imaging criteria on MRI to diagnose API can make placental MRI reporting more consistent and accurate and thus aid in surgical planning.

CLINICAL RELEVANCE/APPLICATION
Introducing a placental MRI grading scale with major and minor imaging criteria to assign confidence in diagnosing abnormal placental implantation, improving reports' accuracy and consistency.

Advances in Gynecologic Ultrasound

Wednesday, 08:30 AM - 10:00 AM ● S405AB

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US OB GU

RC510 • *AMA PRA Category 1 Credit* ™:1.5 • ARRT Category A+ Credit:1.5

RC510A ● 3D Ultrasound in Gynecology

Beryl R Benacerraf MD (Presenter) *

LEARNING OBJECTIVES
1) To learn about the multiplanar reconstruction technique in scanning the pelvis, including its usefulness of looking at the coronal view of the uterus to evaluate the endometrium for polyps, fibroids and mullerian duct anomalies. 2) To learn to use 3D to determine the position of an IUD in the uterus. 3) To learn how 3D can help on detecting the causes of pelvic pain.

ABSTRACT
Three-dimensional (3D) ultrasound allows us to acquire a volume and display any plane of section within that volume regardless of the scanning orientation. The ability to display a 3D image of any type or plane has been one of the most powerful recent advances in sonography, particularly in the field of obstetrics and gynecology. In gynecology, 3D has allowed visualization of coronal view of the uterus, enabling us to diagnose mullerian duct anomalies without using MRI. We can also easily diagnose malpositioned IUDs (a common cause of pelvic pain and bleeding), polyps, submucous fibroids and other abnormalities related to the uterine cavity. 3D ultrasound also greatly facilitates the correct diagnosis of hydrosalpinges because of the infinite planes in which the tubal areas can be displayed.

RC510B ● Ovarian Masses and Cysts

Phyllis Glanc MD (Presenter)

LEARNING OBJECTIVES
1) Analyze ultrasound imaging features of ovarian masses and apply this knowledge to discriminate benign from malignant lesions. 2) Demonstrate some practical tips and hints for problem solving. 3) Apply appropriateness criteria to determine when additional imaging techniques, such as MRI or CT , are indicated.

ABSTRACT
The first line of imaging when an ovarian lesion is suspected is ultrasound. In this session we will review classical imaging features on ultrasound, demonstrate some tips and pitfalls and evaluate some less common findings. We will utilize this information to triage patients into different management strategies. We will incorporate current consensus and appropriateness criteria guidelines into our critical thinking. The role of additional imaging techniques such as MRI, CT and PET will also be discussed.

RC510C ● Uterus and Endometrium

Ruth B Goldstein MD (Presenter)

LEARNING OBJECTIVES
1) Be able to state the acceptable standards for endometrial assessment in women with abnormal vaginal bleeding. 2) Be able to recognize a uterine abnormality in a postmenopausal woman that warrants further evaluation including tissue sampling or MRI. 3) Be able to recognize and diagnose adenomyosis. 4) Be able to diagnose a Mullerian Duct Anomaly of the uterus.

Fallopian Tube Catheterization (Hands-on Workshop)

Wednesday, 08:30 AM - 10:00 AM ● E260

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OB GU

RC550 • *AMA PRA Category 1 Credit* ™:1.5 • ARRT Category A+ Credit:1.5
Amy S Thurmond , MD *
Ronald J Zagoria , MD
Lindsay S Machan , MD *
Antoine J Maubon , MD
Arl Van Moore , MD
Anne C Roberts , MD *
David M Hovsepian , MD *

LEARNING OBJECTIVES
1) Obtain hands-on experience with fallopian tube catheterization using uterine models and commercially available catheters and guidewires. 2) Review the evolution of interventions in the fallopian tubes. 3) Learn safe techniques for fallopian tube recanalization for promoting fertility, and fallopian tube occlusion for preventing pregnancy. 4) Discuss the outcomes regarding pregnancy rate and complications. 5) Appreciate ways to improve referrals from the fertility specialists and expand your practice.
ABSTRACT
Fallopian tube catheterization using fluoroscopic guidance is a relatively easy, inexpensive technique within the capabilities of residency trained radiologists. Fallopian tube cathterization can be used to dislodge debris from the tube in women with infertility,or to place FDA-approved tubal occlusion devices in women who do not desire fertility. The fallopian tube is the 1 mm gateway between the egg and the sperm. Noninvasive access to this structure for promoting, and preventing, pregnancy has been sought for over 160 years. This hands-on course allows participants use commercially available catheters and devices in plastic models for fallopian tube catheterization, and to speak directly to world experts about this exciting procedure.

Vascular/Interventional (Venous Access/Women's Intervention)

Wednesday, 10:30 AM - 12:00 PM ● E353A

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IR VA OB GU

SSK23 • *AMA PRA Category 1 Credit* ™:1.5 • ARRT Category A+ Credit:1.5
Moderator
Bart L Dolmatch , MD *
Moderator
Anne C Roberts , MD *

SSK23-01 ● Central Venous Access: Evolving Roles of Radiology and Other Specialties Nationally over Two Decades

Richard Duszak MD (Presenter) ; **Nadia Husain** ; **Daniel D Picus** MD ; **Danny Hughes** PhD ; **Baogang Xu** PhD

PURPOSE
To evaluate national trends in central venous access (CVA) procedures over two decades with regard to changing specialty group roles and places of service.

METHOD AND MATERIALS
Aggregated claims data for temporary central venous catheter (CVC) and long-term central venous access device (CVAD) procedures were extracted from Medicare Physician Supplier Procedure Summary master files from 1992 through 2011. CVC and CVAD procedure volumes by specialty group and place of service were studied.

RESULTS
Between 1992 and 2011, temporary and long-term CVA placement procedures increased from 638,703 to 808,071 (+27%) and 76,444 to 316,042 (+313%), respectively. For temporary CVCs, radiology (0.4% in 1992 to 32.6% in 2011) now exceeds anesthesiology (37.0% to 22.0%) and surgery (30.4% to 11.7%) as the dominant provider group. Surgery continues to dominate in placement and explantation of long-term CVADs (80.7% to 50.4% and 81.6% to 47.7%, respectively), but radiology&#65533;s share has grown enormously (0.7% to 37.6% and 0.2% to 28.6%). Although volumes remain small (
CONCLUSION
Over the last two decades, CVA procedures on Medicare beneficiaries have increased considerably. Radiology is now the dominant overall provider.

CLINICAL RELEVANCE/APPLICATION
As venous access procedures have increased dramatically in Medicare beneficiaries over the last two decades, radiology#39;s relative contributions to these important services has expanded dramatically

SSK23-02 ● Mechanical Failure with a Radiologically Placed Totally Implantable Central Venous Arm Port System

Jasmin D Busch MD (Presenter) ; **Catherine T Mahler** ; **Christian R Habermann** MD ; **Andreas Koops** MD ; **Gerhard B Adam** MD ; **Harald Ittrich** MD

PURPOSE
To evaluate the frequency of mechanical failures, in particular catheter line rupture and fragment embolization, related to a radiographically controlled and brachially placed totally implantable central venous arm port system (TCVAP) used for mid- to long-term vascular access.

METHOD AND MATERIALS
A retrospective audit of our Centricity Radiology Information System (GE Healthcare, Braunschweig, Germany) was performed from 2006 until April 2013 to determine the number of Cook Vital-Port Mini Titanium (Cook Medical Inc., Limerick/Ireland) implanted between January 1, 2006, and June 30, 2011 and the frequency of device-related complications (mechanical failure, rupture and fragment embolization) until demise or explantation.

RESULTS

CONCLUSION
With the Cook Vital-Port Mini Titanium implanted at the upper arm we observed in 2.3% a partially or complete catheter line fracture associated with a high incidence of fragment embolization. The high rate of clinically unapparent catheter line fractures demands special attention of TCVAP users to recognize malfunctions. Despite from the risk of extravasation in patients under chemotherapy, in particular, fragment embolization puts the patients at risk for further severe complications.

CLINICAL RELEVANCE/APPLICATION
TCVAP are a proper tool for vascular access. However, due to the accumulation of material failure further investigation are warranted to determine the cause of material failure.

SSK23-03 ● Characteristics of an Infectious Complication on Implantable Venous-access Port

Jisue Shim ; **Tae Seok Seo** MD, PhD ; **In-Ho Cha** MD, PhD ; **Myung Gyu Song** MD (Presenter) ; **Eun-Young Kang** MD ; **Hwan Seok Yong** MD ; **Chang Hee Lee** MD

PURPOSE
The purpose of this study is to assess the demographic and bacteriologic characteristics and risk factors of implantable venous-access port (IVAP)-associated infection.

METHOD AND MATERIALS
Between August 2003 and November 2011, we placed 1,747 ports in interventional radiology suites. A total of 144 and 1,603 ports were placed in patients with hematologic malignancy and with solid tumor, respectively. We removed 45 ports to treat port-related infection, from 37 patients with systemic febrile symptom and 8 patients with signs of local infection. We evaluated the incidence of port-related infection, demographic factors, bacteriologic data, and patients' progress by review of medical record. Univariate analyses (chi-square test and Fisher's exact test) and multivariate logistic regression analyses were used to determine the risk factors for complications.

RESULTS
Overall, 45 (2.58%) out of 1,747 ports were removed for infectious symptom, with an incidence rate of 0.075 events/1,000 catheter-days. The incidence rate of port-related infection was higher in hematologic disease patient than in solid organ tumor patient (p=0.03). The infection rate was higher in inpatients intervention than outpatients (p=0.02). Hematologic malignancy was the only significant risk factor of IVAP-related infection (OR 0.304, 95% confidence interval 0.144-0.643, p=002). Microorganisms were isolated from 30 (66.7%) blood samples. Causative organisms were Staphylococcus species (n=13), Candida species (n=9), Non-tuberculosis Mycobacterium (n=2), Escherichia coli (n=1), Acinetobacter baumannii (n=2), Klebsiella pneumonia (n=2), Rhodotorula mucilaginosa (n=1) and Enterococcus faecium (n=1). Additionally, catheter tip culture studies were positive in nine cases and isolated microorganisms were same as blood culture studies. Wound culture in localized infection revealed no organisms in all cases.

CONCLUSION
The incidence of IVAP-related infection was significantly higher in hematologic malignancy patient and when intervention was done after admission. The common causative organisms were Staphylococcus and Candida species. The explantation of devices seems to be helpful for treatment of local and systemic infection suspiciously related with IVAPs.

CLINICAL RELEVANCE/APPLICATION
The knowledge of the characteristics of IVAP-related infection may be helpful to manage infected port.

SSK23-04 ● Patients' Perceptions of Peripherally Inserted Central Catheter for Cancer Treatment: A Comparative Single-institution Prospective Analysis

Francois-Xavier Arnaud MD (Presenter) ; **Christophe Teriitehau** ; **Gabrielle Weber-Donat** ; **Denis Metivier** ; **Caroline Bouzad** ; **Julien Potet** MD *

PURPOSE
To prospectively assess the perceptions of cancer patients of having a PICC and to compare these perceptions with those of non-cancer patients.

METHOD AND MATERIALS
Patients' perceptions were registered on three occasions (T1, right after PICC placement; T2: 1 week after placement and T3: three weeks after placement), with the use of two specific questionnaires. Questionnaire I contained 17 items covering five domains (anxiety, information, pain, procedure duration and discomfort), whereas questionnaire II was made up of 17 items covering 6 domains (pain, information,restrictions in daily activities, anxiety, discomfort and overall satisfaction) Results were analyzed considering the cancer group and then compared to the non-cancer group using Pearson chi-squared or Fisher's exact tests and Student T-tests. Regression tests were performed to study the association between different factors and the procedure-related pain at T1 or the global satisfaction at T2 and T3.

RESULTS
150 PICCs were implanted in 125 consecutive patients (78 patients in the cancer group and 47 in the non-cancer group). Pain level was low (2.5, 95% CI 2.0-2.9) in cancer patients at T1 and decreased at the end of the procedure (0.5, 95% CI 0.2-0.7). 96.2% of cancer patients found that the pain was equal or lower than expected before the procedure. Disturbing factors were venous puncture (24.4% of patients), local anesthesia (23.1%) and lying position on the angiography table (20.5%) in cancer patients. Pain levels at exit-site at T2 and T3 were low but significantly higher in the cancer group than in the non-cancer group (T2: 0.9 vs 0.4, p=0.05 and T3 : 0.8 vs 0.2, p=0.01). At T2, global satisfaction was 5.4 times worse in painful patients (p=0.02). Cancer patients stated that the PICC interfered when taking a shower (48.1% of patients at T2),but not for basic activities. They mostly feared that PICC might be a source of infection (46.3% vs 18.2% in non-cancer patients, p=0.008). No factor of disturbance, discomfort or fear was associated with a worse global satisfaction.

CONCLUSION
PICC placement and port during hospitalization were well accepted by cancer patients. Physicians should focus on exit-site pain treatment in cancer patients for a better satisfaction.

CLINICAL RELEVANCE/APPLICATION
PICC placement was well tolerated and PICC device were a well-accepted method of delivering chemotherapy and supportive agents in the daily life of cancer patients.

SSK23-05 ● Preliminary Study on the Safety and Efficacy of Ultrasound Guided High-intensity Focused Ultrasound (USgHIFU) Treatment of Symptomatic Uterine Fibroids Using High Sonication Energy Protocol

H. Y. J Leung (Presenter) ; **Simon C Yu** MD ; **Ka Lok Lee** MBChB ; **Mabel M Tong** MBBCh ; **Helen Hoi Lun Chau** ; **Eva Chun Wai Cheung** ; **Alyssa Sze Wai Wong** ; **Anil T Ahuja** MD

PURPOSE
To assess the safety and efficacy of ultrasound guided high-intensity focused ultrasound (USgHIFU) treatment of symptomatic uterine fibroids using high sonication energy protocol.

METHOD AND MATERIALS
This was a prospective on going phase one study. Protocol was approved by institutional review board and informed consent were obtained. A total of 20 patients with 22 symptomatic fibroids were included in the study and were treated with US-guided HIFU ablation. The fibroids were ablated using dot mode under power output of 800 -1500W for 1500 - 2000 sonication pulses at each spot. The primary endpoints were peri-procedural complications. The secondary endpoints were clinical symptomatic improvement and radiological evidence of treatment response including degree of fibroid infarction and volume shrinkage at 3 months after treatment. The symptoms studied include pain, menorrhagia, and fibroid related urinary symptoms and these were assessed by pain score, pictorial chart score, Urogenital Distress Inventory (UDI -6) and Incontinence Impact Questionnaire (IIQ-7). The degree of fibroid infarction was assessed by dynamic contrast 3T MRI and was reflected by non-perfused ratio (NPR) calculated as non-perfused volume as a percentage of the total fibroid volume.

RESULTS
Nineteen patients tolerated the treatment well and were treated on an outpatient basis. One patient who received treatment for a fibroid located
CONCLUSION
This prospective study suggests that USgHIFU may be safe and effective in treating symptomatic uterine fibroids in carefully selected patient group. Uterine fibroids which are located
CLINICAL RELEVANCE/APPLICATION
USgHIFU ablation using high sonication energy protocol may be safe and effective in treating symptomatic uterine fibroids in carefully selected patient group.

SSK23-06 ● Non-invasive In Vivo Estimation of Uterine Fibroid Thermal Conductivity in Magnetic Resonance Imaging Guided High Intensity Focused Ultrasound (MR-HIFU) Therapy

Jiming Zhang * ; **John H Fischer** MD ; **Pei-Herng Hor** PhD ; **Raja Muthupillai** PhD (Presenter) *

PURPOSE
To estimate *in vivo* thermal conductivity of uterine fibroid tissue from the spatio-temporal evolution of temperature during MR guided focused ultrasound surgery (MR-HIFU) in women.

METHOD AND MATERIALS
All MR-HIFU was performed at 1.5 T using a commercial MR-HIFU platform (Sonalleve®, Philips Healthcare) with a 256Ch spherical shell HIFU transducer (1.2-1.4 MHz), and an integrated receiver coil . The temperature evolution after 13 volumetric sonications in three women was recorded in real-time using a multi-shot echo planar imaging technique described previously[1]. All subjects provided written informed consent as per IRB guidelines.
Estimation of thermal conductivity: Thermal conductivity is calculated based on Pennes's bio-heat transfer equation. The spatio-temporal temperature evolution following heating is modeled by a Gaussian distribution[2]. If, S_{xy} and S_z and represent the standard deviation of the spatio-temporal temperature spread in the in-plane/through-plane monitoring slices, then the rate of change of over time yields thermal diffusivity D and thermal conductivity k[2].

RESULTS
A total of 13 cells with diameters of 4mm (n=3), 8mm (n=7), and 12mm (n=3) were used to treat uterine fibroids. The mean temperature elevated from 37ºC to 64.8 ± 1.4ºC, resulting in an average 240 EM dose volume of 1.8 ±1.3 cm^3 across cells. From the recorded spatial-temporal temperature profiles, the thermal conductivity(k) was estimated to be 0.5 ± 0.06 W/(m.K).

CONCLUSION
The results from our study show that it is possible to estimate thermal conductivity of human uterine fibroid tissue *in-vivo* from spatio-temporal evolution of temperature during volumetric MR-HIFU. In-vivo uterine fibroid thermal conductivities across different cell sizes were within 13% of the mean, indicating close agreement, and is roughly similar to reported thermal conductivities of skeletal muscle. 1. Kohler, et al. Med. Phys., 36(8), 3521-35, 2009 2. Zhang, et al. JMRI, 37(4), 950-7, 2012

CLINICAL RELEVANCE/APPLICATION
1. Effectivness of tissue ablation during MR-HIFU in vivo is influenced by tissue thermal properties such as thermal conductivity which can be estimated from spatio-temporal evolution of temperature.

SSK23-07 ● MRgFUS Treatment of Uterine Fibroids: Evaluation of Fibroid Volume, Perfused Volume (PV) and Clinical Scores Modifications at 6-month and 12-month Follow Up

Marta Vaiani MD (Presenter) ; **Irene Invernizzi** MD ; **Paola Enrica Colombo** ; **Fabio Zucconi** MPH ; **Angelo Vanzulli** MD ; **Cristiana Ticca** MD

PURPOSE
to assess the correlation between fibroid volume, perfused volume (PV) and clinical scores modifications at 6-month (6-m) and 12-month (12-m) follow up evaluation, in 28 patients with 32 fibroids treated with Magnetic Resonance guided Focused Ultrasound Surgery (MRgFUS)

METHOD AND MATERIALS
32 symptomatic uterine fibroids in 28 women (age 35-54 y-o) underwent MRgFUS treatment between September 2010 and January 2012 using the ExAblate 2000 system (InSightec). Before treatment T2weighted multiplanar MR images were obtained to measure uterine fibroids volume. Immediately after treatment T1weighted contrast-enhanced fat-sat multiplanar MR images were used to measure the Non-Perfused Volume (NPV) and to define PV subtracting NPV from fibroid volume. Similar images obtained 6±1 months and 12±2 months after treatment were used to determine fibroid volume and PV modifications. The Symptom Severity Score (SSS) and Quality of Life Score (QOLS) were examined before treatment and at 6-m and 12-m. Quantitative and qualitative relations between fibroid volume, PV and clinical scores modification at baseline, 6-m and 12-m were measured (analysis of variance, Spearman correlation)

RESULTS
Fibroid volume significantly decreased from 140±126cm^3 to 102±107cm^3 (6-m) and 100±103cm^3 (12-m) (p The average post-treatment PV ratio (p-tPV ratio, considered as post-treatment PV divided by initial volume) was 29±17% and PV significantly increased between baseline and 12-m from 44±56cm^3 to 74±88cm^3 (p

CONCLUSION
MRgFUS treatment of uterine fibroids determines significant fibroid shrinkage and clinical improvement already after 6-m, and results are still important even after 12-m. The significant PV increase between post-treatment and 12-m is not correlated with p-tPV ratio and does not affect the clinical improvement of patients

CLINICAL RELEVANCE/APPLICATION
MRgFUS is a non-invasive, safe and effective treatment for uterine fibroids; the PV significant increase between post-treatment and 12-m does not affect the important clinical improvement of patients

SSK23-08 ● The Apparent Diffusion Coefficient (ADC) Value of the Uterine Adenomyosis for the Prediction of the Potential Response to Uterine Artery Embolization (UAE)

Yaewon Park (Presenter) ; **Dae Chul Jung** ; **Man Deuk Kim** MD

PURPOSE
To determine the utility of the apparent diffusion coefficient (ADC) value for the prediction of the potential response to uterine artery embolization (UAE) for symptomatic adenomyosis.

METHOD AND MATERIALS
Our study included twenty-three patients who underwent diffusion weighted (DW) MRI before UAE between June 2011 and November 2012. All patients underwent 3 months follow-up MRI after UAE. The embolic agent used was polyvinyl alchohol(PVA) particle. A quantitative measurement of the ADC was performed for each adenomyosis. Complete response was defined as more than 90% of non-perfusion area of adenomyosis following UAE at 3 months follow-up MRI. Incomplete response was defined as less than 90% of non-perfusion area at follow-up MRI. ADC value was compared between patients that achieved complete response and incomplete response after UAE via analysis. Statistical analysis was performed to evaluate the diagnostic performance of the predictor for differentiated the complete from the incomplete response.

RESULTS
Of the twenty-three patients, seventeen showed complete response and six showed incomplete response. The ADC ranged from 0.8413 ± 1.2440 x $10^{-3}mm^2/s$(mean 1.0745 ± 0.1122). The mean ADC of the complete response group was 1.0449 ± 0.1063 and 1.1585 ± 0.0881 in the incomplete response group(p value = 0.029). Using a threshold of lesser than 1.1475 x $10^{-3}mm^2$, the sensitivity and specificity of the ADC for the prediction of success after UAE were 83.3% and 82.4%, respectively.

CONCLUSION
The ADC of uterine adenomyosis can be utilized as a predictor for successful response of UAE in adenomyosis.

CLINICAL RELEVANCE/APPLICATION
The ADC of uterine adenomyosis is a potential predictor for complete response of UAE in symptomatic adenomyosis.

SSK23-09 ● Embolization of Symptomatic Post-abortion Uterine Arteriovenous Malformations

Helene Vernhet-Kovacsik MD, PhD ; **Valerie Monnin-Bares** ; **Hamid Zarqane** (Presenter) ; **Sebastien Bommart** MD

PURPOSE
To assess immediate and mid-term clinical outcome of hyperselective embolization of symptomatic post-abortion uterine arterio-venous malformations (AVM).

METHOD AND MATERIALS
Since January 2009, 13 consecutive women with acquired symptomatic (bleeding) intra-uterine post-abortion arteriovenous malformation were referred in our institution. Women with AV malformation persisting 10 weeks after abortion, as demonstrated my MR angiography and/or US doppler were referred for

embolization. MRI was performed before and after embolization (1 month). Technical success, immediate and mid-term (6-36 months) clinical outcome (recurrent bleeding, myometral necrosis or infection) and imaging follow-up (myometral thickness and enhancement after injection of gadolinium, presence of residual AVM) were recorded.

RESULTS
At 10weeks after abortion, 11/13 women had persistent AV malformation. Hyper-selective embolization using Onyx (n=9) , particles (n=2) was performed during 1 (n=6), 2 (n=2) up to 3 (n=3) sessions. Complete technical success was reached in 9/11 cases. The MAV could not be completely occluded in 2 case (arterial ovarian supply, uterine supply). Bleeding was stopped in all cases and recurrent spotting at 3 months was noted in 2 cases (cases with technical failure). No uterine necrosis nor infection was present at -mid-term follow-up. At MRI, a persistent active AVM was present in 2 cases, myometral thickness was decreased at the site of the embolized AVM in 2 cases and normal enhancement of the entire uterine wall was present in 10/11 cases.

CONCLUSION
Hyperselective embolization ofpost-abortion uterine AVM is safe and immediately efficient but clinical mid-term outcome closely depends on technical success of embolization

CLINICAL RELEVANCE/APPLICATION
Hyperselective embolization of post-abortion uterine AVM is safe and efficient when complete.

GU Ultrasound 2013: The Expert's Update on Kidney, Gynecologic and Testicular US

Thursday, 08:30 AM - 10:00 AM • N228

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US OB GU

RC607 • *AMA PRA Category 1 Credit* ™:1.5 • ARRT Category A+ Credit:1.5

Coordinator
John J Cronan , MD
Mindy M Horrow , MD *
Paula J Woodward , MD *

LEARNING OBJECTIVES
1) The learner will be made aware of the importance of acute kidney injury (AKI) and associated ultrasound findings. 2) Ultrasound criteria of cystic adnexal masses will be reviewed. 3) Testicular and scrotal pathology and the importance of ultrasound will be explained.
ABSTRACT
Ultrasound has taken on new importance in the evaluation of the kidney, female pelvis and the scrotum/ testicles.
We will explain the ultrasound findings of acute kidney injury (AKI), the evaluation of pelvic masses and the necessary follow-up. Finally, a review of the testicle and ultrasound findings will complete the course.

The Acute Abdomen and Pelvis (An Interactive Session)

Thursday, 08:30 AM - 10:00 AM • E450A

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ER CT OB GU GI

RC608 • *AMA PRA Category 1 Credit* ™:1.5 • ARRT Category A+ Credit:1.5

RC608A • Imaging of Acute Pancreatitis: Current Concepts

Jorge A Soto MD (Presenter) *

LEARNING OBJECTIVES
1) To review the appropriate terminology that should be implemented when describing glandular and peri-glandular findings in acute pancreatitis, following the revision of the Atlanta classification. 2) To identify the importance of glandular necrosis in defining the prognosis of acute pancreatitis. 3) To describe the technical aspects that are necessary for acquiring good quality CTexaminations in acute pancreatitis. 4) Illustrate specific situations where MR can be a valuable tool in the evaluation of acute pancreatitis.

RC608B • Non-contrast CT of the Acute Abdomen

Douglas S Katz MD (Presenter)

LEARNING OBJECTIVES
1) To review the current indications for performing non-contrast CT of the acute abdomen and pelvis. 2) To demonstrate examples of non-contrast CT of the acute abdomen and pelvis. 3) To highlight the advantages and potential limitations of non-contrast CT of the acute abdomen and pelvis, compared with other CT protocols/other cross-sectional imaging examinations. 4) To briefly review areas of controversy with CT protocols (e.g. appendicitis).

ABSTRACT

RC608C • CT of the Acute Female Pelvis

Anjali Agrawal MD (Presenter)

LEARNING OBJECTIVES
1) Highlight the importance of recognition of acute gynecologic conditions on CT. 2) Outline the physiologic processes that may present as acute pelvic pain and their CT findings. 3) Describe the CT features of common pathologic causes of acute female pelvis. 4) Illustrative case examples with correlative imaging findings on sonography or MRI to improve the understanding of the anatomy and pathology on CT.

ABSTRACT

Increasing Your Gynecological MRI Referral Base: Reaching Out to the Gynecologists (An Interactive Session)

Thursday, 08:30 AM - 10:00 AM • E353B

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MR OB GU

RC629 • *AMA PRA Category 1 Credit* ™:1.5 • ARRT Category A+ Credit:1.5

RC629A • Mullerian Anomalies - Guiding Management

Julia R Fielding MD (Presenter)

LEARNING OBJECTIVES
1) Review the MR appearance of the septate and bicornuate uterine anomalies. 2) Define a routine MR protocol to accurately characterize anomalies. 3) Outline the necessary components in the radiology report that are of the most value to the referring physician.

ABSTRACT

RC629B • Pelvic Floor Dysfunction and Other Postpartum Sequelae

Amy S Thurmond MD (Presenter) *

LEARNING OBJECTIVES
1) Review the complex anatomy of the female pelvic floor. 2) Understand the effect of childbirth on the muscles, ligaments, and organs of the pelvis. 3) Learn the appropriate use of fluoroscopic procedures, ultrasound, CT and MRI for diagnosis of long-term sequelae of obstetric trauma. 4) Appreciate the pre-operative considerations for treatment of pelvic prolapse and vaginal fistulas.

ABSTRACT
Anatomy of the female pelvic floor is complex, and divided into three compartments. The anterior compartment contains the urinary bladder and the urethra;

the middle compartment contains the uterus, cervix, and vagina; and the posterior compartment contains the rectum. Pregnancy and childbirth, by nature of the process, result in trauma to the tissues and over time lead to weakness of the tissues and pelvic floor dysfunction including stress urinary incontinence, as well as fistula formation between the organs in the three compartments.

RC629C • Endometriosis: What the Gynecologist Wants to Know

Antoine J Maubon MD (Presenter)

LEARNING OBJECTIVES
1) Review clinical indications that should lead to imaging for the detection of endometriosis. 2) Technique of US and MRI for the detection of endometriosis. 3) Review classic and unusual locations of endometriosis, that must be assessed when imaging. 4) Assess the contribution of Imaging in the work up and treatment planning of endometriosis, either painful or for infertility probaly linked with endometriosis.

ABSTRACT
Does my patient with pelvic pain have endometriosis?
Does my infertile patient have endometriosis?
What type of endometriosis is it, ovarian, peritoneal, infra peritoneal, uterine, digestive, elsewhere?
What is the fertility prognosis for my infertile patient with endometriosis?
Can Imaging help me in the decision making for treatment of this endometriosis?
These are the FAQ that gynecologists keep asking for their patients, in the gynecology or in the infertility clinic. This course will give answers to these questions through examples of real life cases using the best adapted techniques US and MRI.

Emergency Body MRI: Vascular Emergencies, Abdominal Emergencies and the Pregnant Patient (How-to Workshop)

Thursday, 08:30 AM - 10:00 AM • E261

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ER MR VA OB GI

RC651 • *AMA PRA Category 1 Credit* ™:1.5 • ARRT Category A+ Credit:1.5
Christine O Menias , MD
Constantine A Raptis , MD
Vamsi R Narra , MD,FRCR *

LEARNING OBJECTIVES
1) Review the role of MRI as a primary diagnostic modality for evaluation of acute abdominal and pelvic pathologies. 2) Describe the various clinical scenarios as it pertains to vascular emergencies, abdominal emergencies and the evaluation of an acute abdomen in a pregnant patient. 3) Case examples of pertinent entities of Acute abdomen on MRI will be reviewed.
ABSTRACT
Magnetic resonance imaging (MRI) is now more readily available in the emergency room setting and is becoming the primary modality used to diagnose acute abdominal pathologies in situations where there may be relative contraindications to computed tomography (CT). A review by MRI of various acute abdomen conditions is presented. The future directions of MRI in evaluating patients with abdominal emergencies are also briefly discussed.
Review the MRI features of Acute Hepatic and Biliary entities such as Choledocholithiasis, cholecysttis cholangitis, Hepatic abscess and Mirizzi syndrome MRI features of acute pancreatitis and complications such as necrotizing, hemorrhagic and pseudoaneurysm
Review the MRI imaging features of acute Genitourinary entities suce as renal abscess, pyonephrosis and obstructing ureteral stone Acute Gyn entities include MRI imaging of PID , ovarian torsion , hematocolpos, and ruptured hemorrhagic cyst Review the Acute gastrointestinal disorders on MRI such as SBO, mesenteric arterial and venous ischemia crohns, colitis, and Peptic ulcer disease

Essentials of Genitourinary Imaging

Thursday, 10:30 AM - 12:00 PM • S406B

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OB GU

MSES52 • *AMA PRA Category 1 Credit* ™:1.5 • ARRT Category A+ Credit:1.5

MSES52A • Incidentalomas of the Female Pelvis: How to Avoid Overdiagnosis Without Missing Cancer

Susanna I Lee MD,PhD (Presenter)

LEARNING OBJECTIVES
1) Assess the likelihood that an incidentally detected pelvic mass is cancer based on imaging features and clinical presentation. 2) Effectively and safely evaluate incidental adnexal masses with US, MRI and FDG-PET. 3) Identify and triage endometrial lesions that warrant further workup. 4) Recognize which "enlarged fibroid uterus" may be harboring a cancer.

ABSTRACT

MSES52B • Imaging of Non-Traumatic Abdominal Pain in the Pregnant Patient

Keyanoosh Hosseinzadeh MD (Presenter) *

LEARNING OBJECTIVES
1) Detail safety issues of US, CT and MR during pregnancy with discussion of the risks and benefits of the individual modalities. 2) Discuss imaging algorithm for the common non-obstetric and non-traumatic etiologies of abdominal pain in the pregnant patient with a focus on gastrointestinal, genitourinary and hepatobiliary disorders.

MSES52C • MR Imaging of GU Emergencies

John A Spencer MD (Presenter)

LEARNING OBJECTIVES
1) Unremitting maternal loin pain in pregnancy. 2) Assessment of indeterminate adnexal masses discovered on acute abdominal imaging.

ABSTRACT
Loin pain in pregnancy is not uncommon and may result from urinary tract infection or from hydronephrosis. Usually hydronephrosis results from 'physiological' causes and is almost universal in the third trimester, more pronounced on the right side. This not a true ureteric obstruction and differs from that due to obstruction from say a ureteric calculus. MR imaging allows confident distinction between these alternative diagnoses. With physiological hydronephrosis the ureter is extrinsically compressed between the psoas muscle and the gravid uterus. No renal oedema is present nor perinephric fluid as are present with genuine obstruction. Fast MR imaging using heavily T2 weighted 'water' sequences identifies the level of calibre change in the ureter and focussed high resolution T2 weighted imaging through this level defines the cause. T2 weighted or diffusion weighted imaging shows differential renal hydration. An obstructed kidney loses its normal corticomedullary pattern and shows cortical oedema. Calculi are shown as filling defects. Evaluation of painful hydronephrosis in pregnancy: magnetic resonance urographic patterns in physiological dilatation versus calculous obstruction. Spencer JA et al. J Urol 2004; 171: 256-260. As US is increasing bypassed in the imaging work up of the acute abdomen so an increasing number of young women with acute gynaecological conditions are found to have indeterminate pelvic findings on CT. Adnexal emergencies may produce challenging US findings and TVUS is often declined or poorly tolerated by women with pelvic peritonitis. Adnexal torsion and cyst accident (rupture or bleeding) have characteristic MR features. Acute pelvic bleeding may produce confusing features. Adnexal torsion: a multimodality imaging review. Wilkinson C & Sanderson A. Clin Radiol 2012; 67: 476-483. We will review these MR findings using a case based approach.

Imaging and Treating Gynecologic Cancer 2013: What Really Works and What Is Most Cost Effective

Friday, 08:30 AM - 10:00 AM • N226

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OI OB GU

RC807 • *AMA PRA Category 1 Credit* ™:1.5 • ARRT Category A+ Credit:1.5

LEARNING OBJECTIVES

RC807A • What Really Works: Overview of Imaging Procedures and Algorithm for Staging Gynecology

Julia R Fielding MD (Presenter)

LEARNING OBJECTIVES
1) To review the appearance of gynecologic cancer on CT, PET and MR images. 2) To determine when and why radiologic staging is necessary. 3) To show an algorithm that meets the needs of surgical and radiation oncology colleaues.

ABSTRACT
Staging gynecologic malignancies has evolved over the years to include multi-modality imaging. Although the official international standards (FIGO) allow for cross sectional imaging in some cases, examination under anesthesia remains the mainstay of diagnosis. In experienced hands and with the addition of biopsy results, manual staging of cervical cancer is excellent, while endometrial cancers are often understaged. It is now routine to stage advanced ovarian cancer with CT scans. The goal of this course is to impart 1) best imaging practices based on ACR guidelines, 2) review cost effectiveness of current staging algorithms and new imaging techniques and 3) show the important interactions required between radiology and radiation oncology to provide state of the art care.

RC807B ● Radiology Findings: Impact on Radiation Therapy

Nina A Mayr MD (Presenter)

LEARNING OBJECTIVES
1) To review current types of radiation therapy in use for gynecologic cancer. 2) To show the essential anatomic information required from imaging tests. 3) To demonstrate the value of functional and/or fused imaging in radiation therapy.

RC807C ● What Does It Cost? Appropriate Use of Imaging Technology

Katarzyna J Macura MD, PhD (Presenter) *

LEARNING OBJECTIVES
1) To assess the appropriateness of utilization of imaging modalities in the work-up of women with gynecologic malignancies. 2) To discuss the cost of imaging technologies and oncologic outcome optimization.

Disclosure Index

A

Awai, K. - Research Grant, Toshiba Medical Sysmtes Research Grant, Hitachi Medical Corporation Research Grant, Bayer AG Research Consultant, DAIICHI SANKYO Group Research Grant, Eizai Ltd

B

Barth, R. A. - Research Consultant, General Electric Company
Benacerraf, B. R. - Consultant, General Electric Company
Brown, R. - Investor, RadExchange, LLC

C

Carrascosa, P. M. - Research Consultant, General Electric Company
Coursey, C. A. - Research support, Becton, Dickinson and Company

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Dogra, V. S. - Editor, Reed Elsevier Editor, Wolters Kluwer nv
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Knechtges, P. M. - Travel support, CDI Minneapolis
Kohan, A. - Research support , Koninklijke Philips Electronics NV
Kohli, M. D. - Research Grant, Koninklijke Philips Electronics NV Research Grant, Siemens AG

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Zhang, J. - Research support, Koninklijke Philips Electronics NV