

Educational Exhibit Competition

Accepted Abstracts

120644

MRI Features of Endometrial Carcinoma with Exophytic Polypoidal Growth and Endocervical or Vaginal Protrusion: A Pictorial Essay

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PRESENTER LEVEL OF TRAINING: Fellow

LEARNING OBJECTIVES:

- Illustrate MRI findings of Endometrial Carcinoma with Exophytic Polypoidal Growth and Endocervical or Vaginal Protrusion
- Review surgical nuances and their radiologic correlation.
- Describe oncologic management and prognostic considerations.

BACKGROUND: Exophytic polypoidal endometrial carcinoma (EC) extending into the endocervical canal or vagina is an uncommon but clinically significant presentation. It poses diagnostic and staging challenges, impacts surgical approach, and occasionally alters adjuvant treatment decisions. This pictorial essay illustrates MRI findings of such cases, and reviews surgical nuances, prognostic considerations, and oncologic management.

CONCLUSION: After reviewing this educational exhibit, the reader will be able to recognize and understand the key imaging features, clinical implications, and differential considerations related to this topic. The content is intended to enhance familiarity with these concepts and support their integration into daily radiologic practice. In particular, exophytic polypoidal endometrial carcinoma with endocervical or vaginal protrusion is a rare but critical MRI finding. Meticulous multiplanar evaluation and awareness of pathologic patterns are essential for accurate staging and for providing appropriate surgical guidance.

120723

Basic Guide on Abdominal Imaging Radiogenomics and Its Implication on Clinical Practice

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PRESENTER LEVEL OF TRAINING: Radiologist

LEARNING OBJECTIVES:

- Understand basic concepts of radiogenomics and influence on radiology practice.
- Overview of common mutations and imaging phenotypes by organ system in a case-based manner.
- Learn how imaging interpretations become more meaningful and specific, when cancer genomics and imaging characteristics are integrated.

BACKGROUND: Clinical cancer care has entered an era of genomics and personalized medicine, allowing improved appreciation of tumor diversity, and the development of new tumor classifications, biomarkers and treatments. Radiologists play a key role in cancer patient management and need to be familiar with the clinical implication of cancer genomics and imaging characteristics. By grasping these concepts, the radiologists will be able to make their imaging interpretations more meaningful and specific, facilitate their multidisciplinary clinical dialogue and provide a better patient-centred care.

CONCLUSION: The “Omics” revolution allows for personalized medicine, where diagnosis, treatment options, and prognostication rely heavily on genomic, epigenomics and transcriptomics profiles for each patient. Radiogenomics is an emerging radiology field that seeks to correlate imaging phenotypes with cancer genotypes. Radiogenomic features, molecular pathways, key radiological findings and their implication in diagnosis, treatment and prognostication will be discussed by organ system, including liver (hepatocellular carcinoma), pancreas (pancreatic ductal adenocarcinoma), colorectal cancer, small bowel (gastrointestinal stromal tumor), adrenal glands (pheochromocytomas and paragangliomas).

120780

Implementing Cardiovascular Risk Screening Using Breast Arterial Calcifications on Screening Mammography: A Multidisciplinary Framework

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PRESENTER LEVEL OF TRAINING: Radiologist

LEARNING OBJECTIVES:

- Explain the significance of breast arterial calcifications (BAC) detected on routine mammography as a marker of cardiovascular risk in women.
- Describe the multidisciplinary roles and collaboration required among radiologists, cardiologists, primary care providers, and other stakeholders in implementing BAC-based cardiovascular screening.
- Identify the clinical workflow and infrastructure needed to integrate BAC assessment into routine mammographic interpretation and reporting.
- Develop strategies to educate patients and healthcare teams about the relevance of BAC findings and appropriate follow-up care pathways.
- Assess the opportunities, challenges, and health equity implications in opportunistic screening through BAC reporting on mammography.

BACKGROUND: Cardiovascular disease (CVD) is the leading cause of death in women. Women are five times more likely to die from heart disease than from breast cancer, however, most women are unaware of their cardiovascular risk status. There are limited opportunities or awareness on how to proactively screen for CVD in women, and many at-risk women are missed by current screening tools. Breast arterial calcifications (BAC) are associated with increased cardiovascular risk and may serve as a surrogate tool for early identification of asymptomatic patients at higher risk of cardiovascular disease. With recent changes to breast cancer screening guidelines recommending screening mammography beginning at age 40, more women are attending routine screening mammogram appointments, increasing the potential for impactful opportunistic or dual screening for cardiovascular risk using BAC. Binary reporting of BAC on mammography, with an emphasis in women under 55 years of age, can identify women at higher cardiovascular risk and allow for earlier implementation of risk-mitigating strategies. The purpose of this educational exhibit is to provide an overview of the clinical relevance and utility of harnessing breast arterial calcifications (BAC) and their association with increased cardiovascular risk as a tool for opportunistic screening, and to describe a framework for implementation of BAC reporting and management.

CONCLUSION: Multidisciplinary collaboration, education, and engagement between radiologists, primary care, and cardiologists is vital to ensure sustainable implementation and to optimize patient outcomes. Leveraging artificial intelligence offers the potential to enhance BAC detection and establish standardized methods for assessment and quantification. Establishing a combined breast cancer and cardiovascular screening program outlining workflow integration and defining clinical management pathways will better enable women and their healthcare providers to understand and implement preventive strategies that enhance overall health outcomes.

122358

A Novel Visual Algorithmic Framework for Teaching Imaging Indications and Decision Pathways: Bridging the Educational Gap in Undergraduate Radiology Education

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PRESENTER LEVEL OF TRAINING: Medical Student

LEARNING OBJECTIVES:

- Highlight the importance of imaging indication education in the undergraduate medical curriculum
- Offer a user-friendly visual framework that integrates evidence-based imaging guidelines (CAR and ACR Appropriateness Criteria)
- Promote evidence-based, resource-conscious, and sustainable imaging
- Discuss its benefit in fostering interdepartmental collaboration and cross-disciplinary learning

BACKGROUND: Imaging appropriateness and indications are critical yet underrepresented components of undergraduate medical education. Learners often encounter imaging requisitions with limited guidance or prior teaching, resulting in a gap between guideline knowledge and clinical application. The Imaging Algorithm Handbook is developed at a Canadian University to bridge this gap through a novel visual and algorithmic framework. Each section presents a concise flowchart that synthesizes Canadian Association of Radiologists (CAR) and American College of Radiology (ACR) imaging indication guidelines, applied to common clinical scenarios (e.g., right lower quadrant pain, pulmonary embolism, minor head trauma). By introducing this framework early in medical training within clinical settings, learners can develop practice patterns that reinforce evidence-based, resource-conscious, and sustainable imaging from the outset. Furthermore, it fosters interdisciplinary learning, highlighting radiology as an integral component of other medical disciplines.

CONCLUSION: The Imaging Algorithm Handbook is a novel, visually driven framework for teaching imaging indications and decision pathways. It could serve as a valuable tool for bridging the educational gap while promoting evidence-based, sustainable, and collaborative radiology education.

122515

MRI Evaluation of Polyethylene Glycol Hydrogel Spacer in Treatment of Prostate Cancer: A Pictorial Review

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PRESENTER LEVEL OF TRAINING: International Medical Graduate

LEARNING OBJECTIVES:

- To review the role and mechanism of polyethylene glycol (PEG)-based hydrogel spacer during prostate brachytherapy.
- To briefly review the workflow of SpaceOAR™ insertion
- To outline the MRI protocol for spacer gel evaluation.
- To illustrate normal MRI appearances of spacer gel.
- To demonstrate MRI evaluation of malpositions and complications.

BACKGROUND: Introduction - Prostate cancer is one of the most common malignancies in men, and radiation therapy remains a cornerstone of curative management. However, the rectum's close proximity to the prostate makes it vulnerable to radiation toxicity, including proctitis and rectal bleeding. To mitigate this, polyethylene glycol (PEG)-based hydrogel spacers, such as SpaceOAR™, are injected into the rectoprostatic space to increase the separation between the prostate and rectum, reducing rectal dose by up to 80%. The gel remains stable for approximately three months and is naturally resorbed thereafter. At a Canadian provincial cancer program, SpaceOAR™ is routinely employed for radiotherapy planning, and MRI serves as the reference imaging modality for evaluating spacer position, morphology, and complications. **MRI Protocol** MRI is performed one week post-insertion using the following sequences: • Sagittal T2-weighted: evaluates prostate-rectum separation and craniocaudal gel extent. • Axial T2-weighted: assesses symmetry, thickness (5-15 mm considered optimal), and proximity to rectal wall. • Coronal T2-weighted: confirms lateral extension and uniform distribution. No antiperistaltic agents or rectal preparation are required. **Normal MRI Appearance** A correctly placed hydrogel spacer appears as a T2-hyperintense, well-defined cushion between the prostate and rectum, extending from the apex to the base. Uniform thickness and midline positioning are expected. Minor asymmetry is acceptable if rectal displacement is adequate. **MRI-Detected Malpositions and Complications** Malposition includes superior (posterior to seminal vesicles) or inferior (toward perineum) displacement. Rectal wall infiltration (RWI) is graded on T2 MRI: • Grade 0: no wall signal change • Grade 1: edema without penetration • Grade 2: partial muscularis involvement • Grade 3: full-thickness infiltration or Other complications including fistula formation, venous intravasation (linear T2 signal), and abscess formation (T2-bright fluid) have been significantly rare.

CONCLUSION: MRI provides superior soft-tissue resolution for evaluating spacer geometry, detecting rectal wall infiltration, and identifying complications. Accurate MRI interpretation ensures optimal radiotherapy planning and enhances treatment safety in prostate cancer patients treated with SpaceOAR™ hydrogel.

122673

MRI-Guided Cervical Cancer Brachytherapy: Technique and MRI Evaluation - A Pictorial Review

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PRESENTER LEVEL OF TRAINING: International Medical Graduate

LEARNING OBJECTIVES:

- To summarize the role of brachytherapy in the definitive management of cervical cancer.
- To describe the structure and workflow of the Geneva Universal Gynecological Applicator (Elekta).
- To illustrate magnetic resonance imaging (MRI) interpretation following applicator insertion and during post-treatment tumour response assessment.

BACKGROUND: Cervical cancer remains one of the most common gynecologic malignancies. For locally advanced disease, the standard of care involves combined external-beam radiation therapy (EBRT) and high-dose-rate brachytherapy with concurrent cisplatin chemotherapy. Brachytherapy enables precise delivery of a highly conformal dose to the cervix and parametrium while sparing adjacent organs. The introduction of MRI-guided adaptive brachytherapy (IGABT) has revolutionized treatment planning by providing unparalleled soft-tissue contrast, allowing accurate visualization of tumour extent, applicator geometry, and organs at risk. This imaging-based approach has led to improved local tumour control and decreased treatment-related morbidity compared with traditional point-based dosimetry. Brachytherapy Applicator and Insertion WorkflowAt our facility - a Canadian Cancer Centre - the -Geneva Universal Gynecological Applicator (Elekta) is used for cervix brachytherapy delivery. It is a versatile modular system used for intracavitary and interstitial brachytherapy. It consists of an intrauterine tandem, interchangeable ovoids or ring components, and integrated channels for interstitial needle placement. Under general anesthesia or conscious sedation, the tandem is inserted through the cervical canal, followed by attachment of ovoids or a ring. When parametrial involvement exists, interstitial needles are inserted through guiding tubes to enhance coverage. Vaginal packing and a rectal retractor maintain implant stability and help to reduce dose to the vaginal walls and rectum. MRI Evaluation and Tumour Response AssessmentFollowing applicator insertion, T2-weighted sagittal, axial, and coronal MRI sequences are obtained to confirm correct tandem orientation, ovoid symmetry, and needle trajectory. MRI also delineates the gross tumour volume, high-risk, and intermediate-risk clinical target volumes. During subsequent fractions, MRI demonstrates progressive loss of high T2 signal intensity within the cervix and parametria, indicating therapeutic response. Persistent focal hyperintensity suggests residual viable tumour, guiding adaptive plan modification to achieve optimal local control while decreasing adverse effects with respect to bladder or bowel function at 1 and 3 months after completing treatment.

CONCLUSION: MRI-guided brachytherapy provides precise, image-adapted radiation delivery. Radiologist expertise in MRI interpretation of applicator placement and treatment response is key to optimizing accuracy and improving outcomes.

122741

AI Powered Tools for Radiology Residency Program Administration

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PRESENTER LEVEL OF TRAINING: Medical Student

LEARNING OBJECTIVES:

- Identify high-impact applications of AI that can enhance radiology program administration.
- Examine how AI tools can improve efficiency in scheduling, curriculum oversight, and radiology trainee evaluation within postgraduate medical education (PGME).
- Appraise the ethical, privacy, and bias-related considerations when adopting AI solutions in radiology education.

BACKGROUND: Radiology program leaders face increasing administrative burdens including curriculum mapping, competency tracking, and complex scheduling, all amid growing accreditation and wellness demands. Strategic applications of artificial intelligence (AI) tools reduces repetitive workloads and offers scalable solutions, allowing radiology administration to divert greater focus towards radiology mentorship and educational quality improvement. This exhibit presents emerging evidence-based AI techniques for radiology program administration in a comprehensive and digestible format, highlighting the current state of each application, its potential for success, and best tips and practices to implement these tools. We also highlight ethical challenges, privacy barriers, and bias considerations to evaluate before adoption by radiology program leaders.

CONCLUSION: AI tools have the potential to change radiology administrative practices by providing more workload support, allowing program leaders to reclaim time for strategic PGME planning and operations. By applying an evidence-based approach that responsibly manages the systemic risks of bias and data security, programs can employ evidence-based AI tools to sustain high-quality training for future radiologists.