الجامعة التقنية الوسطى

كلية التقنيات الصحية والطبية/ بغداد

قسم: تقنيات الاشعة المادة: التصوير بالرنين المغناطيسي
المرحلة: الرابعة

Title: MRI of the male pelvis **العنوان:**

Name of the instructor: **اسم المحاضر:**

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Target population: **الفئة المستهدفة:**

طلبه المرحلة الرابعة في قسم تقنيات الاشعة

Introduction: المقدمة:

learning about MRI of the male pelvis is essential for MRI technicians to perform MRI exams effectively, interpret MRI results accurately, ensure patient safety, understand anatomy and pathology, and collaborate with other healthcare professionals. MRI technicians can acquire this knowledge through specialized training programs, continuing education courses, and on-the-job experience.

Pretest: الاختبار القبلي:

Which coil we will need for the pelvis exam and for which indication we need to do it?

Scientific Content: المحتوى العلمي:

Common indications

•• Localization of undescended testicles
•• Prostatic lesions
•• Carcinoma of the bladder
•• Rectal lesions
•• Infertility
•• Impotence

Equipment

•• Body coil/phased array pelvic coil/multi-array coil and local rectal coil for prostate imaging (can be used in conjunction with a phased/ multi-array coil)

•• Compression bands and foam immobilization pads
•• Earplugs/headphones

Patient positioning

The patient lies supine on the examination couch. Foam pads and compression bands can be applied across the patient's lower pelvis to reduce respiratory and bowel motion (unless the patient cannot tolerate this).

The patient is positioned so that the longitudinal alignment light lies in the midline, and the horizontal alignment light passes through a point midway between the pubis symphysis and the iliac crests. If a local rectal coil is used, it should be carefully inserted prior to the examination.

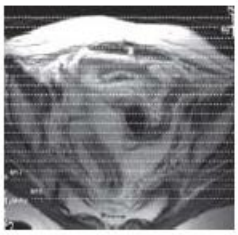
Ensure that it is correctly positioned and fully inflated. An empty bladder can minimize motion artifacts from urine. However, a full bladder can aid visualization

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of bladder wall anatomy and pathology by improving definition between anatomy, (e.g. differentiating prostate from bladder wall).



Patient Position- Pelvic Array Coil



Axial localizer for coronal slices



Coronal localizer for axial slices



Coronal localizer for sagittal slices

Common Male Pelvis MRI Sequences:

1. T1-Weighted Imaging:
    - Parameters:
        - Slice thickness: 3-5 mm
        - TR (Repetition Time): 400-800 ms
        - TE (Echo Time): 5-20 ms
    - Use: Provides detailed anatomical information and helps in visualizing the structures within the male pelvis, including the prostate, bladder, rectum, and seminal vesicles.
2. T2-Weighted Imaging:
    - Parameters:
        - Slice thickness: 3-5 mm
        - TR: 2000-5000 ms
        - TE: 80-120 ms
    - Use: Highlights differences in tissue water content and is valuable for assessing soft tissues within the pelvis, such as the prostate, muscles, and pelvic organs.

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3. Diffusion-Weighted Imaging (DWI):
    - Parameters:
        - Slice thickness: 3-5 mm
        - b-values: Typically 0 and 800-1000 sec/mm²
    - Use: Measures the diffusion of water molecules in tissues and can be helpful in identifying and characterizing lesions within the prostate and pelvic organs, particularly in the detection of prostate cancer.
4. Dynamic Contrast-Enhanced Imaging:
    - Parameters:
        - Slice thickness: 3-5 mm
        - Temporal resolution: 5-10 seconds
        - Contrast agent: Gadolinium-based contrast agent
    - Use: Evaluates perfusion and vascularity within the prostate and surrounding tissues, aiding in the detection and characterization of prostate tumors.
5. MR Spectroscopy (MRS):
    - Parameters:
        - Acquires spectra from specific regions of interest, often the prostate.
    - Use: Measures biochemical information within the prostate tissue and can assist in characterizing prostate lesions, differentiating between benign and malignant tissue.
6. Pelvic Floor Imaging:
    - Parameters:
        - Specialized sequences for pelvic floor assessment.
    - Use: Helps evaluate pelvic floor disorders, such as pelvic organ prolapse and fecal incontinence, by assessing the position and integrity of pelvic floor structures.

Specific Uses:

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- Prostate Imaging: MRI of the male pelvis is commonly used for prostate cancer detection, staging, and assessment of treatment response. It helps visualize the prostate gland and any abnormalities within it.
- Pelvic Organ Assessment: MRI can assess the bladder, rectum, seminal vesicles, and other pelvic organs for abnormalities, tumors, or inflammatory conditions.
- Evaluation of Pelvic Pain: MRI is used to investigate the cause of pelvic pain, including conditions like prostatitis, cysts, and inflammation of pelvic organs.
- Pelvic Trauma: MRI can be employed to assess pelvic trauma and injuries, such as fractures or soft tissue injuries in the pelvis.
- Pelvic Inflammatory Disease (PID): MRI helps detect and assess the severity of PID, an infection of the female reproductive organs, which can also affect male partners.

The choice of MRI sequences and parameters may vary depending on the clinical indication and the specific pelvic condition being evaluated. Consultation with a radiologist or healthcare provider is essential to determine the most appropriate MRI protocol for your specific needs.

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Posttest: الاختبار البعدى:

What are the common sequences of the male pelvis?

References: المصادر:

Handbook of MRI Technique Catherine Senior 5TH EDITION 2022
Step by step MRI Jaganmohan Reddy v parsed

Radiopedia