A comprehensive guide in Prostate MR Imaging providing an overview of current, advanced techniques, Central Pitfalls and Correction Strategies.

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Abstract

The second most prevalent cause of death among men in Western Europe is prostate cancer, with an incidence above of 200 in each 100,000 males. Currently, several clinical screening methods are employed in order to detect this neoplasm including elevated Prostate Specific Antigen Test (PSA), Digital Rectal Exam (DRE) and Trans-Rectal Ultrasound (TRUS)-Guided Biopsy. However, approximately 35 per cent of prostate cancer is missing when using these examinations. In the last few decades, there has been growing usage of Prostate Magnetic Resonance Imaging (MRI) as a non-invasive high accurate tool in the detection and diagnosis of prostate cancer. MRI is beneficial not only in localization, but also in assessment of lesion aggressiveness, which may overcome the sampling errors related to TRUS-guided biopsy. Thus, it is useful for clinicians to measure Gleason Score. Moreover, MRI protocol can be beneficially used in an Active Surveillance, which means monitoring patients with low-volume and low-grade prostate cancer while they are under deferred immediate therapy.

In the other hand, pelvic magnetic resonance imaging (MRI) involves many challenges that are not encountered to the same degree in other body regions. Complications that uniquely affect body MRI include physiologic motion from respiratory and bowel motion. By introducing of technical innovations in MRI, such as the development of phased-array coils, high performance gradients, and methods to reduce motion-related artefacts, body imaging can be obtained with excellent contrast resolution in a reasonable scanning time. In order to optimize prostate MR protocols and improve its efficiency, it is essential for the radiographer to be familiar with basic MR imaging principles and able to minimize the effects of motion artefact. Therefore, the purpose of this review is to discuss the prostate MRI technique and address some challenges that may encounter MR radiographers.

Image

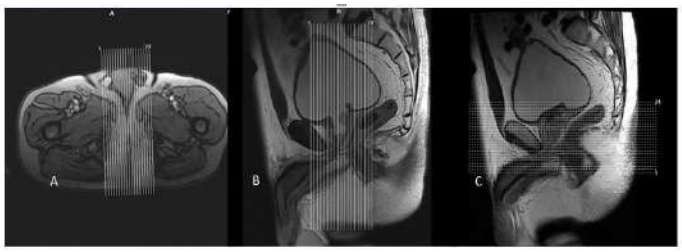


Figure 2. Sagittal: The slices are planned on the axial and coronal localizers, and placed parallel to prostatic urethra with suitable angulation as needed. They must cover the whole prostate and seminal vesicles.
Axial: angle the slices to be perpendicular to prostatic urethra or peripheral zone on sagittal plane,
Coronal: Coronal slices are placed on the sagittal plane and angled to be parallel to prostatic urethra, the whole prostate and seminal vesicles must be covered.

Recent Publications

1- Alhashlan E, Alshreeh NH, Albishr H, et al. Evaluation of some literature reviews to determine contrast enhanced magnetic resonance angiography can replace the other imaging modalities for the assessment of carotid artery stenosis. J Cancer Prev Curr Res. 2023;14(2):39-44. DOI: 10.15406/jcpcr.2023.14.00516.

2- Ali Mohd Ali Alyami, Munassar Dakkam Lasloom, Hashan Dakkam Alsallum, Essa Alhashlan, Mohammed Ali Alammari (2022) "ROLE OF CHEST COMPUTED TOMOGRAPHY SCANS IN THE EVALUATION OF CHEST MORPHOLOGY IN COVID-19 PATIENTS". doi: 10.5281/zenodo.7489196.

3- A. Alqahtani, S. Akram, M. Ramzan, F. Nawaz, H. U. Khan et al., "A transfer learning based approach for covid-19 detection using inception-v4 model," Intelligent Automation & Soft Computing, vol. 35, no.2, pp. 1721–1736, 2023.

4- Essa, Alhashlan., Shuayl, Alqufayli., Mohammed, Fares, Almonajem., A., Dhaen., Saleh, Y., Alabbas., Nashwah, Alhareth. (2022). Evaluation of female pelvic mass by MRI and CT scan. Journal of Cancer Prevention & Current Research, 13(4), 110-116. Available from: 10.15406/jcpcr.2022.13.00498

5- Alhashlan E, Al Rishan AH, Alajmi M. A comprehensive guide in prostate MR imaging providing an overview of current, advanced techniques, central pitfalls and correction strategies. J Cancer Prev Curr Res. 2022;13(4):105–108. DOI: 10.15406/jcpcr.2022.13.00497



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