Looking Beyond the Prostate – Incidentalomas on Prostate MRI

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Disclosures

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Objectives

• Review the imaging characteristics of various incidental or unexpected findings encountered on prostate MRI.

• Briefly discuss the clinical implications of the various lesions of the male pelvis often found incidentally on prostate MRI.
Introduction - Prostate MRI

• Multiparametric MRI continues to evolve as a powerful modality for the detection, localization, and staging of prostate cancer.

• The expanding use of MRI for the evaluation of prostate cancer has led to an increase in the number of incidental findings found in the male pelvis.

• Many of these incidental findings are benign, however, many of these findings have various clinical implications. Therefore, it is imperative that the interpreting radiologist be able to recognize and accurately characterize these lesions.
Commonly Encountered Incidentalomas

• Prostatic Utricle Cyst
• Ejaculatory Duct Cysts (paramedian Cysts)
• Cowper Syringocele
• Seminal Vesicle Cysts
• Cystic Degeneration Benign Prostatic Hypertrophy
• Prostatic Abscess

• Granulomatous Prostatitis
• Abdominal Aortic Aneurysm
• Avascular Necrosis of the Hip
• Extraprostatic Malignancies
  • Bladder (Urothelial) Cancer
  • Colorectal Cancer
  • Osseous Metastases

* This presentation will focus on lesions in white text
Prostatic Utricle Cysts

- Embryologic remnant of the Mullerian duct system
- Occurs in 1-5% of the population
- Usually asymptomatic (especially when small)
- May present with recurrent UTI, epididymitis, pain or post-voiding incontinence.
- Malignant degeneration has been reported in as many as 3% of cases
Prostatic Utricle Cysts

Imaging

- Always midline arising at the level of the venumontanum
- Always freely communicate with the prostatic urethra and never extend above the base of the prostate

MRI images demonstrate a T2 hyperintense lesion (arrows) that does not extend beyond the prostate base
Prostatic Utricle Cysts

• Prostatic utricle cysts may become infected

• When infected they may contain hemorrhage, pus or both which will alter intrinsic imaging characteristics on MRI

• No follow-up is indicated if asymptomatic

• When symptomatic, surgical resection is the treatment of choice
Ejaculatory Duct Cyst

- Aka Paramedian Cysts
- Rare
- Caused by obstruction of the ejaculatory duct
- Can be congenital or acquired
- Often asymptomatic
- Major causes of infertility
  - Clinical findings may include oligospermia, hematospermia, and azoospermia
Ejaculatory Duct Cyst

Imaging

- Round or oval cystic structures along the ejaculatory duct
- Located in the central zone of the prostate, just lateral to the midline and above the level of the verumontanum
- May contain calculi, pus or hemorrhage
- MRI often depicts the cause of the ejaculatory duct obstruction

MR images reveal an ovoid T2-hyperintense signal lesion with thin internal septations (arrows)
The lesion is located just lateral to midline along the course of the right ejaculatory duct and just posterior to the bladder neck
Cowper Syringocele

- Rare
- Paired exocrine structures in the urogenital diaphragm, immediately caudal to the prostate gland
- Converge to form one confluent passage that drains into the posterior bulbous urethra
- Obstruction can cause cysts known as syringoceles
- Can be congenital or acquired (due to infection of trauma)

MR images demonstrate a T2-hyperintense cystic lesion at the base of the penis (arrows), adjacent to the proximal bulbous urethra.
Cowper Syringocele

- Classified into two variants (open or closed) based on relation to urethra
- Each variant has unique clinical presentation
- Open – more common
  - Postvoid dribbling, urethral discharge, pain, hematuria, urinary incontinence
- Closed
  - Obstructive symptoms (i.e. urinary retention, dysuria, and pain)

- MRI useful for classifying open or closed variant
- Most asymptomatic
- Surgery is treatment of choice when symptomatic
Seminal Vesicle Cysts

• Paired accessory glandular structures that produce and secrete the majority of the seminal fluid

• Extraperitoneal in location interposed between the bladder and the rectum

• May be congenital or acquired

• Often associated with various anomalies including ectopic ureter insertion, PCKD, or ipsilateral renal agenesis or dysgenesis
**Seminal Vesicle Cysts**

**Imaging**
- Round or oval cystic structures posterior to the bladder
- Fluid signal on T2-weighted imaging
- Variable signal on T1-weighted imaging, depending on concentration of hemorrhage or proteinaceous fluid

T2-weighted MR images and axial T1-weighted MR image demonstrate a T2-hyperintense/T1-hypointense cystic lesion within the seminal vesicle (arrows).
MR images reveal a seminal vesicle cyst with intrinsic T1-hyperintense signal signifying hemorrhage (arrows).

Axial and coronal images demonstrates a large cystic lesion arising from the left seminal vesicle with associated left renal agenesis in a patient with Zinner’s syndrome (arrows).
Seminal Vesicle Cysts

- Patients with seminal vesicle cysts may present with a myriad of symptoms, such as urinary tract infections, pain, and infertility.

- If symptomatic, laparoscopic partial vesiculectomy is treatment of choice.
Cystic Degeneration of Benign Prostatic Hypertrophy (BPH)

- Common
- Manifests as multiple cystic lesions in the transition zone of the prostate in association with BPH nodules
- Cysts may vary in shape and size. May have calculi
- Hemorrhage and proteinaceous content will affect intrinsic T1 signal
- Typically have urinary obstructive symptoms related to BPH

Axial and Sagittal MR images demonstrate a diffusely enlarged central gland of the prostate with irregular T2-hyperintense nodules (arrows) in a patient with cystic degeneration of BPH
Granulomatous Prostatitis

• Benign inflammatory condition – May mimic prostatic carcinoma both clinically and on MRI

• Elevated PSA and abnormal DRE

• Associated with intravesicular BCG treatment of bladder cancer

• 3 patterns on MRI: diffuse, nodular and cystic
Granulomatous Prostatitis

Patient with history of intra-vesicular BCG treatment for bladder cancer. PSA was elevated and DRE was abnormal.

Axial T2 weighted MR image shows a broad area of hypointense-T2 signal involving most of the right mid prostate gland peripheral zone (arrow).

ADC map derived from DWI demonstrates focal diffusion restriction (arrow) corresponding to the signal abnormality in the right mid prostate gland peripheral zone.
Extraprostatic Malignancies

Colorectal Cancer
- 3rd most commonly diagnosed cancer and 3rd leading cause of cancer death in US men
- Synchronous rectal and prostate cancer has been reported
- Can easily be missed on prostate MRI if interpreting radiologist is not searching for it
MR images show an irregular soft tissue mass infiltrating the posterior right lateral rectum (asterisk). Proven rectal cancer
Bladder (Urothelial) Cancer

- Prevalence of Bladder cancer is much less than prostate cancer
- 60,000 new cases each year in the US
- Incidental detection of bladder cancer could potentially lead to earlier diagnosis and improved outcomes

Axial T2 image demonstrates an eccentric intermediate intensity mass projecting from the left bladder wall (asterisk)
Metastatic Bone Lesions

- MRI is very sensitive for the detection of osseous metastasis
- More than 90% of patients with advanced prostate cancer will have osseous metastases
- The pelvis and lumbar spine are often involved and isolated distant bony metastasis are highly unlikely
- Therefore, routine prostate MRI protocols, which include the pelvis and lumbar spine, could potentially serve as an excellent tool for the detection of osseous metastatic disease
Conclusion

• Incidental or unexpected findings are often encountered on Prostate MRI

• Some of these findings may have serious clinical implications

• With the growing use of prostate MRI, it is imperative that the interpreting radiologist be able to recognize and accurately characterize these lesions
THANK YOU

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