

MR Urethral Diverticulum or Mass MR Pelvis WO & W Contrast

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Contact: (866) 761-4200, option 1

Standard uses: Look at the urethra / adjacent region

- Expected clinical history: Pelvic pain, dysuria, urinary frequency, urgency, incontinence, urethral bleeding, frequent UTIs, urethral mass, follow-up abnormal US or CT finding.
- Use this protocol for urethral diverticulum, urethral fistula, or urethral mass/tumor, anterior vaginal wall lesion.
- Do not use this for penis, labia, pelvic floor / bladder dysfunction, bladder sling / suspension.

****Please call body MD if unsure if this protocol is appropriate****

NOTE: Ask whether or not patient has had any prior surgery, injection or other procedure for urinary incontinence.

- If “yes,” check with body radiologist before proceeding.

Patient prep:

- (1) Should be NPO for >4 hours *except water* prior to study if possible
- (2) Have patient void approximately 30 – 60 minutes before the study begins
- (3) Then (after #2), have patient drink 500 mL water in the 30-60 min before study begins
 - a. Images will be best if bladder is neither totally empty nor full

Coil: Phased array pelvic / torso body coil.

Coverage: Position the coil such that there is optimal coverage and signal from the top of the symphysis pubis through the perineum.

Oral contrast: None.

Intravenous contrast: Single dose gadolinium @ 2 cc / sec (Gadavist, MultiHance if Gadavist unavailable).

SUMMARY:

1. Localizer
2. Coronal T2 (Ultra fast SE) non-FS
3. Axial T1 GRE in/out
4. Axial T2 (Ultra fast SE) non-FS
5. Sag T2 (Fast SE) non-FS
6. Oblique axial T2 (Fast SE) non-FS (small FOV – to urethra)
7. Oblique axial T2 (Fast SE) FS (small FOV – to urethra)
8. Oblique coronal (Fast SE) T2 non-FS (small FOV – to urethra)
9. Axial T1 FS pre-contrast
10. Axial T1 FS post-contrast (x3)
11. Sagittal T1 FS post-contrast
12. Axial DWI

STOP – have patient *partially void* – RESUME

13. Axial T1 FS post-contrast long delay (see below)
14. Subtractions (4 total - all axial)

Sequences:

1. 3 plane localizer
2. Coronal T2 Ultra fast SE (HASTE, SSFSE, FASE) without fat suppression
 - a. Breath hold
 - i. Concatenation/multi-breath hold is less desirable than single breath hold
 - b. FOV: Iliac crests to symphysis pubis.
 - i. Complete front to back coverage (skin to skin)
 - c. Goal parameters
 - i. 7 mm thickness, 25% gap (1.5 mm)
3. Axial T1 GRE in and out of phase
 - a. FOV = Superior iliac crest to perineum
 - b. Goal parameters
 - i. Slice thickness 4 mm
 - ii. In plane acquired resolution <1 mm
 - iii. Number of averages >= 2

4. Axial T2 Ultra fast SE (HASTE, SSFSE, FASE) without fat suppression
 - a. Large FOV = Superior iliac crest to perineum
 - b. Goal parameters
 - i. Slice thickness 4-4.5 mm
 - ii. In plane acquired resolution <1 mm
 - iii. Number of averages ≥ 2

5. Sagittal T2 fast SE (Turbo SE, Fast SE) without fat suppression
 - a. Small FOV = 240-320 mm, see example T2 TSE image in Appendix
 - i. CC extent: Above bladder to below perineum
 - ii. Extend from pelvic sidewall to pelvic sidewall
 - b. Goal parameters
 - i. Slice thickness 3 mm
 - ii. Gap 0%
 - iii. In plane acquired resolution <1 mm
 - iv. Number of averages = 2

6. Oblique axial T2 fast SE (Turbo SE, Fast SE) without fat suppression, small FOV
 - a. Small FOV
 - i. CC extent: At least sacral promontory to below perineum
 - ii. PLANE angulation: Thin slice “true” axial to plane of the urethra = **short axis to the urethra**
 1. *Call radiologist if you have difficulty, occasionally a double oblique technique will be needed when there is significant rotation of the urethra*
 2. *NOTE: Depending on the plane of the urethra, this may end up being an orthogonal axial acquisition*
 3. *See appendix*
 - b. Goal parameters
 - i. **FOV approximately 200-240 mm**
 - ii. Slice thickness 3 mm, 0% gap
 - iii. In plane acquired resolution <1 mm
 - iv. Number of averages ≥ 2

7. Oblique axial T2 fast SE (Turbo SE, Fast SE) with fat suppression, small FOV
 - a. Goal parameters: as for #6.

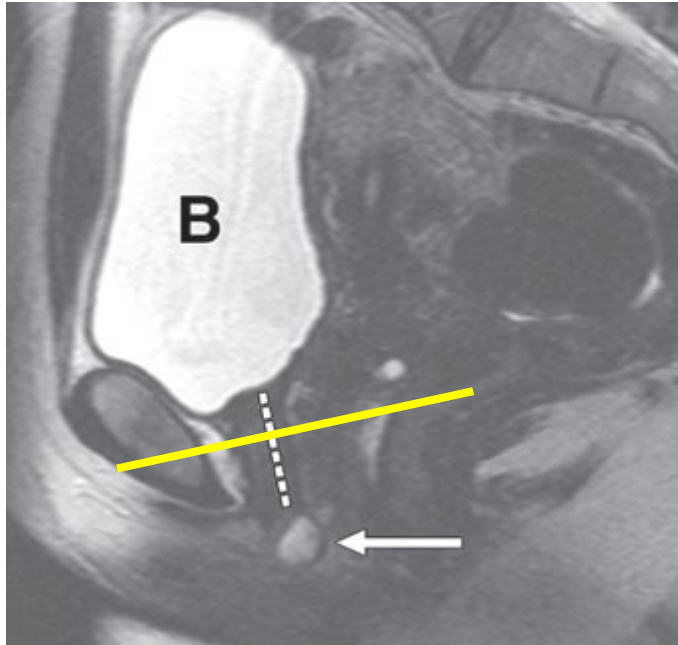
8. Oblique coronal T2 fast SE (Turbo SE, Fast SE) without fat suppression, small FOV
 - a. Small FOV
 - i. CC extent: Slices should extend into bladder and sacrum to below perineum
 - ii. PLANE ANGULATION: Thin slices “true coronal” plane of the urethra = **long axis to the urethra** (coronal to #6 & #7.)
 - iii. *Note: Depending on the plane of the urethra, this may end up being an orthogonal coronal acquisition*
 - iv. *See appendix*

- b. Goal parameters
 - i. Slice thickness 3 mm
 - ii. In plane acquired resolution <1 mm
 - iii. Number of averages ≥ 2
- 9. **Axial T1 Ultra fast 3D-GE with fat suppression (VIBE, LAVA, TIGRE) precontrast**
 - a. Breath hold
 - i. Concatenation/multi-breath hold is less desirable than single breath hold
 - b. FOV:
 - i. CC: Upper bladder to below perineum
 - ii. Trans: Femoral head to femoral head
 - c. Goal parameters
 - i. Slab slices ≤ 3 mm
- 10. **Axial T1 Ultra fast 3D-GRE fat suppressed (VIBE, LAVA, TIGRE) post-contrast (x3)**
 - a. FOV – as #9.
 - b. Slice thickness ≤ 3 mm
 - c. Timing: **25 sec, 60 sec, 2 min**
- 11. **Sagittal T1 Ultra fast 3D-GRE fat suppressed (VIBE, LAVA, TIGRE) post-contrast**
 - a. FOV – as in #5.
 - b. Slice thickness ≤ 3 mm
 - c. Timing: After axial #10., approx. **3 min delay post injection**
- 12. **Axial DWI**
 - a. Free breathing
 - b. Same plane and FOV as #9
 - c. Goal parameters = 50/400/800 and ADC map

STOP exam – have patient PARTIALLY VOID – restart for final sequence

- 13. **Axial T1 suppressed (VIBE, LAVA, TIGRE) post-contrast – long delay**
 - a. FOV – as #9.
 - b. Slice thickness ≤ 3 mm
 - c. Timing: **approximately 15 min delay post injection (can be longer)**
- 14. Subtraction series: 4 total (axial)
 - a. NOTE: Can be 3 total if there are issue with subtracting last axial delay to do re-positioning

APPENDIX:



Dotted line = urethra (oblique coronal)

Yellow line = oblique axial

Arrow = urethral diverticulum

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Read More: <https://www.ajronline.org/doi/10.2214/AJR.08.1547>