

MR Bladder Mass

MRI Pelvis W & WO Contrast

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Standard uses: **Urologist order only** - bladder cancer (initial evaluation, follow-up) with contraindication to CT (anaphylaxis to iodinated contrast), other bladder or distal UVJ mass.

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), patient to 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

Oral contrast: None

Coil: Phase array body coil.

Coverage: Position the coil such that there is good coverage and signal from the entire bladder. Include at least iliac crests to the perineum.

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

NOTE: DWI/ADC sequences to be done before contrast administration to decrease possible susceptibility artifact in the bladder.

SUMMARY

1. Localizer
2. Coronal T2 (Ultra fast SE) non-FS (large FOV)
3. Axial T2 (Ultra fast SE) non-FS
4. Axial T1 GRE in/out
5. Axial T2 (fast SE) non-FS
6. Axial T2 (fast SE) FS
7. Sag T2 (fast SE) non-FS
8. Coronal T2 (fast SE) non-FS (small FOV)
9. Axial DWI/ADC
10. Axial T1 FS pre-contrast
11. Axial T1 FS post-contrast (x3)

12. Coronal T1 FS post-contrast
 13. Sag T1 FS post-contrast
 14. Subtractions (axial x 3)
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Sequences:

1. 3 plane localizer with breath hold.
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: Aortic bifurcation to perineum. Complete front to back coverage (skin to skin)
 - c. Goal parameters
 - i. 7 mm thickness, 25% gap (1.5 mm)
 - ii. Number of averages = 1
3. Axial T2 Ultra fast SE (HASTE, SSFSE, FASE) without fat suppression – large FOV
 - a. Breath hold
 - i. Concatenation/multi-breath hold is less desirable than single breath hold
 - b. FOV: Iliac crests to perineum
 - c. 6 mm thickness, 25% gap
 - d. Number of averages = 1
4. Axial T1 GRE in and out of phase
 - a. FOV: Just above bladder dome to perineum
 - b. Goal parameters
 - i. Slice thickness 4 mm
 - ii. In plane acquired resolution <1 mm
 - iii. Number of averages ≥ 2
5. Axial T2 fast SE (Turbo SE, Fast SE) without fat suppression
 - a. Just above bladder dome to perineum
 - b. Goal parameters
 - i. Slice thickness 3 mm, 0% gap
 - ii. In plane acquired resolution <1 mm
 - iii. Number of averages ≥ 2
6. Axial T2 fast SE (Turbo SE, Fast SE) with fat suppression
 - a. FOV: 2 cm above bladder dome to perineum
 - b. Goal parameters
 - i. Slice thickness 3 mm, 0% gap
 - ii. In plane acquired resolution <1 mm
 - iii. Number of averages ≥ 2

7. Sagittal T2 fast SE (Turbo SE, Fast SE) without fat suppression
 - a. FOV: 2 cm above bladder dome, include from mid-femoral head to mid-femoral head
 - b. Breath hold
 - i. Concatenation/multi-breath hold is less desirable than single breath hold
 - c. Goal parameters
 - i. Slice thickness 3 mm
 - ii. In plane acquired resolution <1 mm
 - iii. Number of averages ≥ 2

8. Coronal T2 fast SE (Turbo SE, Fast SE) without fat suppression
 - a. FOV = 2 cm above bladder dome and adjacent structures
 - i. Slices should extend superiorly above bladder to perineum
 - b. Goal parameters
 - i. Slice thickness 3 mm
 - ii. In plane acquired resolution <1 mm
 - iii. Number of averages ≥ 2

9. Axial DWI/ADC
 - a. FOV: Iliac crests to symphysis pubis.
 - b. Free breathing
 - c. Goal parameters
 - i. DWI: 50/400/800
 - ii. ADC map

10. Axial T1 Ultra fast 3D-GRE with fat suppression (VIBE, LAVA, TIGRE) **pre-contrast**
 - a. Breath hold
 - i. Concatenation/multi-breath hold is less desirable than single breath hold
 - c. FOV: Just above bladder dome to perineum
 - b. Goal parameters
 - i. Thickness: ≤ 3 mm

11. Axial T1 Ultra fast 3D-GRE with fat suppression (VIBE, LAVA, TIGRE) **post-contrast (x3)**
 - a. Breath hold
 - i. Concatenation/multi-breath hold is less desirable than single breath hold
 - b. FOV – as 10.
 - c. Slice thickness ≤ 3 mm
 - d. Timing: **25 sec, 60 sec, 2 min**

12. Coronal T1 Ultra fast 3D-GRE with fat suppression (VIBE, LAVA, TIGRE) **post-contrast**
 - a. FOV = Cover entire bladder and adjacent structures
 - i. Slices should extend superiorly above bladder to perineum

- b. Slice thickness \leq 3 mm
 - c. Timing: After last axial post in #11, **approx. 3 min delay post injection**
13. Sagittal T1 Ultra fast 3D-GRE with fat suppression (VIBE, LAVA, TIGRE) **post-contrast**
- a. FOV: Cover pelvic organs, extending into each femoral head
 - b. Slice thickness \leq 3 mm
 - c. Timing: after coronal #12, **approx. 4 min delay post injection**
14. Subtraction series: 3 total (axial)

Radiologist's perspective:

Generally, evaluation of bladder cancer is most appropriate with CT urogram. However, occasionally urologists with have other questions regarding the tumor, such as invasion through/beyond the bladder wall. MR can be used to add more information. If this has NOT been ordered by a urologist, please contact a body radiologist for further guidance.