RADY401 Case Presentation: Bladder Mass

Jamie Michael, June 2021
Focused patient history and workup

**Chief complaint:** “blood in urine”

**History of Present Illness**
- Soreness of lower abdomen with severe cramping after urination
- Intermittent hematuria with some clots
- **ROS:** good appetite, weight stable, no fevers

**Past Medical History**
- Spinal stenosis
- Hyperlipidemia

**Family History**
- Mom: breast cancer

**Social History**
- 60 pack year smoker, quit 5 years ago, continues to vape
- Drinks 6 beers/night
- Lives with partner, 3 adult children
- Former truck driver

**Allergies - NKA**

**Physical Exam/Workup**
- Soft, nondistended abdomen with mild tenderness
- Urinalysis: +RBC
List of imaging studies

• Bladder/Pelvis Ultrasound
• CT Abdomen Pelvis With and Without Contrast
• PET CT Skull Base to Thigh
• IR Biopsy (CT and US-guided)
1. What study is this?
2. Sagittal plane on left. Anechoic structure is the bladder and you can see posterior enhancement below.
3. Can you point out the finding?
1. What study is this? **ULTRASOUND OF BLADDER**
2. Sagittal plane on left. Anechoic structure is the bladder and you can see posterior enhancement below.
3. Can you point out the finding? **SOLID MASS BLADDER RIGHT POSTERIOR WALL w VASCULARITY**
1. What study is this?
2. This is a transverse/axial view. You see the bladder with rectum posterior and rectus abdominis muscle anterior. Femoral heads are hyperdense.
3. Can you point out the finding?
1. What study is this? **CT PELVIS**
2. This is a transverse/axial view. You see the bladder with rectum posterior and rectus abdominis muscle anterior. Femoral heads are hyperdense.
3. Can you point out the finding? **BLADDER DIVERTICULUM WITH ILL-DEFINED MASS ANS RIGHT EXTERNAL ILIAC LYMPH NODE 1.6 cm size**
Here is a series of coronal CT images. For reference here is the liver, IVC, bladder, femoral head moving posteriorly from left to right and you can see the mass coming into view.
Here is a series of coronal CT images. For reference here is the liver, IVC, bladder, femoral head moving posteriorly from left to right and you can see the mass coming into view.
1. What study is this?
2. Can you identify the area of increased uptake?
1. What study is this? PET CT
2. Can you identify the area of increased uptake? AXIAL VIEW OF PELVIS 1.4 cm LYMPH NODE (CIRCLED) WITH MODERATE FDG UPTAKE, THE PURPOSE OF THE STUDY. BLADDER UPTAKE IS PHYSIOLOGIC EXCRETION
Initial ultrasound images of the R groin were obtained, demonstrating a hypoechoic mass adjacent to the right common femoral vein. Local anesthesia, needle was left in place and limited spiral CT was performed to confirm location. Here is a CT axial image where you can see the needle going into the node. Under continuous US guidance, a needle was inserted into the right inguinal lymph node and 4 cores were obtained. They also obtained post procedure CT to ensure no hematoma.
Patient treatment or outcome

US and CT A/P w/ diverticulum, soft tissue mass and reactive lymph node

PET imaging demonstrates multiple reactive nodes

IR biopsy R inguinal node, pathology benign

TURBT with pathology with squamous cell carcinoma

Partial cystectomy with Urology scheduled
1. Cystoscopy is currently the best test for evaluation of bladder as a possible source of hematuria.

2. One small study showed US has sensitivity of 87.1% and specificity of 98.1% for initial diagnosis of bladder tumors.

3. Was US appropriate for this patient?
### Imaging discussion 2

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Procedure</th>
<th>Adult RRL</th>
<th>Peds RRL</th>
<th>Appropriateness Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bladder cancer, invasive, untreated, staging</td>
<td>Radiography chest</td>
<td>&lt;0.1 mSv</td>
<td>&lt;0.03 mSv [ped]</td>
<td>Usually appropriate</td>
</tr>
<tr>
<td></td>
<td>CT abdomen and pelvis without and with IV contrast</td>
<td>10-30 mSv</td>
<td>10-30 mSv [ped]</td>
<td>Usually appropriate</td>
</tr>
<tr>
<td></td>
<td>MRI abdomen and pelvis without and with IV contrast</td>
<td>0 mSv</td>
<td>0 mSv [ped]</td>
<td>Usually appropriate</td>
</tr>
<tr>
<td></td>
<td>CT abdomen and pelvis with IV contrast</td>
<td>1-10 mSv</td>
<td>3-10 mSv [ped]</td>
<td>Usually appropriate</td>
</tr>
<tr>
<td></td>
<td>MRI pelvis without and with IV contrast</td>
<td>0 mSv</td>
<td>0 mSv [ped]</td>
<td>Usually appropriate</td>
</tr>
<tr>
<td></td>
<td>FDG-PET/CT skull base to mid-thigh</td>
<td>10-30 mSv</td>
<td>3-10 mSv [ped]</td>
<td>May be appropriate</td>
</tr>
<tr>
<td></td>
<td>CT chest with IV contrast</td>
<td>1-10 mSv</td>
<td>3-10 mSv [ped]</td>
<td>May be appropriate</td>
</tr>
<tr>
<td></td>
<td>MRI pelvis without IV contrast</td>
<td>0 mSv</td>
<td>0 mSv [ped]</td>
<td>May be appropriate</td>
</tr>
<tr>
<td></td>
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<td>3-10 mSv [ped]</td>
<td>May be appropriate</td>
</tr>
<tr>
<td></td>
<td>US pelvis (bladder)</td>
<td>0 mSv</td>
<td>0 mSv [ped]</td>
<td>Usually not appropriate</td>
</tr>
</tbody>
</table>

Metastatic workup for bladder cancer can be done with CXR, CT, MRI, FDG-PET/CT, and/or CT chest according to ACR appropriateness criteria.
Imaging discussion 3

<table>
<thead>
<tr>
<th></th>
<th>CT</th>
<th>PET/CT</th>
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<tr>
<td>Sensitivity</td>
<td>46%</td>
<td>46%</td>
</tr>
<tr>
<td>Specificity</td>
<td>92%</td>
<td>97%</td>
</tr>
<tr>
<td>Accuracy</td>
<td>80%</td>
<td>84%</td>
</tr>
</tbody>
</table>
1. Cancer in a bladder diverticulum has no muscular layer and primary staging is different than normal bladder cancer
2. Squamous cell carcinoma is not as sensitive to chemotherapy as classic urothelial carcinoma
3. In rare cases, pre-treatment staging is imperative to help guide management
Imaging discussion 5

Was biopsy an appropriate next step for this patient?
Imaging discussion 5

Was biopsy an appropriate next step for this patient? **YES - IMPORTANT TO EXCLUDE METASTASES AND THEREBY ASSIST PREOP PLANNING**
UNC Top Three

1. Initial imaging in suspected bladder cancer should be done with cystoscopy and CTU, not US
2. PET imaging can be used to guide decision making when CT results are equivocal but avidity of PET should be interpreted with caution
3. Multidisciplinary teams may be necessary for treatment planning in more complicated cases
• ACR appropriateness criteria
• AUA guidelines