AUA Summit - E-Qual

Kevan Sternberg, MD
University of Vermont
Division of Urology
E-Qual- Urologist Perspectives

- There is a definitive need for guidelines and improved standardization regarding imaging for renal colic.
- Understandably, urologists prefer CT
  - Gives a definitive diagnosis- is it a stone causing the symptoms?
  - Helps guide management via accurate stone sizing and stone location
  - Gives additional information- overall stone burden, stone density, appearance of renal parenchyma, degree of obstruction
• While we prefer CT, we SHOULD understand that not every patient with a suspected stone needs one!
• There are risks over cumulative radiation exposure and like it or not, there is a real focus on decreasing this risk.
• We also do not see every patient with a stone- most go home and pass their stones w/o a urologist’s help- therefore getting a CT on everyone is overkill
What are the options?

- No Imaging, Ultrasonography, KUB, CT, Low dose CT, some combination
- Big push for US as initial imaging modality- it is a safe approach and does not miss dangerous alternative diagnoses- Thank you Dr. Smith-Bindman!
- But... We HATE ultrasounds!
  - Can’t see the ureter and may not find the stone
  - Hydronephrosis is not always a reliable predictor
  - Doesn’t give an accurate size measurement
  - How can I council my patient w/o that information!!!
Utility of hydronephrosis

- Retrospective review of patients from 3 institutions who had both US and CT on same day from 2012-2015.
- 85 ureteral stones found in 144 patients.
- US identified a ureteral stone in 22 (25%) and CT in 84.
- Of 62 missed stones on US, ~50% were >5mm.
- Hydronephrosis in 98 (68%); in 12.5% US and CT differed.
- In 108 patients (75.0%) the presence or absence of hydronephrosis on US correctly predicted the presence or absence of a ureteral stone on NCCT.
Issues with stone measurement

- Retrospective review of same group of patients comparing stone presence and size between Ct and US
- 155 had Ct and US on same day, 79 of which both identified a stone for comparison (largest stone diameter)

<table>
<thead>
<tr>
<th>NCCT Measured Stone Diameter</th>
<th>Average Diameter on NCCT (mm)</th>
<th>Average Diameter on US (mm)</th>
<th>Frequency US overestimate</th>
<th>Average US size overestimate (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 5 mm (n=28)</td>
<td>3.9 (1.0)</td>
<td>7.2 (2.7)</td>
<td>82.1% (23/28)</td>
<td>3.3 (84.6%)</td>
</tr>
<tr>
<td>5.1-10 mm (n=38)</td>
<td>7.0 (1.4)</td>
<td>8.9 (4.0)</td>
<td>52.6% (20/38)</td>
<td>1.9 (27.1%)</td>
</tr>
<tr>
<td>&gt; 10 mm (n=13)</td>
<td>13.2 (2.7)</td>
<td>13.6 (2.6)</td>
<td>38.5% (5/13)</td>
<td>0.4 (3.0%)</td>
</tr>
</tbody>
</table>
What happens in follow-up?

- Retrospective review of all ED or Walk-in–center patients from 2009-2015 with visit diagnosis of urolithiasis
- Patient episode= index visit + all subsequent encounters with a CT, US, or KUB within 90 days
- 2,163 episodes (20%) began with an US.
  - 427 (20%) included CT during the following 90 days
- 5,670 patient episodes did not have a CT at the index visit.
  - 589 (10%) had a CT later in the episode
- Average imaging cost was 183% higher if CT performed at index visit
  - $272 vs. $769
- Mean total radiation exposure was 8.1 mSv if CT obtained
  - 1.1 mSV if no CT obtained
Using US as the initial imaging modality for suspected renal colic and avoiding CT on index encounters is associated with most patients avoiding CT altogether, as well as lower overall costs of imaging and exposure to less ionizing radiation.
What are the urologist’s concerns?

- Seeing a patient in follow-up for suspected stones w/o an image obtained or with an US alone
- How do we counsel the patient? Do we need to get additional imaging? If so, what type?
- Well, if they are asymptomatic- can’t you just assume the stone has passed? NO!
- We worry about long term obstruction which can be silent and therefore want to make sure there are no persistent stones in the ureter
What is the answer?

- Multi-disciplinary guidelines/best practice statements to better standardize who gets what imaging
- Education for all players (urologists, emergency physicians, radiologists)- to better understand each perspective and consider all aspects of these patients care