Best Practice Guideline

Management of the Acute Ureteral Stone Event

Diagnosis and screening:

- History (look for typical pain, any symptoms suggestive of UTI)
- Physical Exam (BP, pulse, temperature, presence flank or abdominal tenderness)
    - **Symptoms/signs – acute flank pain, radiating to groin; lower abd/groin pain and LUTs with distal stone; nausea, vomiting; gross hematuria**
- Labs (CBC, BMP, Urinalysis with micro if dip positive, urine culture)
    - **CBC, BMP, UA with micro if dip positive, urine culture; mild leukocytosis common (<15K)**
- Imaging (noncontrast CT abd/pelvis, KUB if stone not visible on CT scout. Ultrasound an option if recent CT that showed only small stones)
    - **Imaging – noncontract CT abd/pelvis imaging modality of choice. If recent CT suggests small stones with good chance of passage, consider ultrasound to screen for hydro nephrosis to limit radiation exposure. If stone not visible on CT scout, obtain KUB to determine if stone visible (KUB can detect an additional 20% of stones not seen on CT scout). If stone visible on KUB, follow with KUB. If not visible on KUB, follow w/CT limited to region of interest if possible (e.g. pelvis for a distal stone)**

Treatment and Management:

- Pain Relief (narcotics and/or NSAIDs; better pain control with NSAIDs). Lower chance of rescue medications for recurrent pain, fewer adverse events and vomiting in meta-analysis.
- Maintenance fluids
- Strain urine
- Urgent intervention in presence of significant infection (stent or nephrostomy) **(Solitary kidney, unremitting pain, high grade persistent obstruction, preservation of renal function, clinical signs of infection – significant fever, leukocytosis)**
- Initial conservative treatment if reasonable chance of stone passage, pain controlled, no significant infection, absence of severe hydronephrosis
- Medical expulsive therapy with alpha blockers (appropriate initial management if no absolute indication for immediate intervention and stone <1cm)
- No indication for routine antibiotics in absence of infection.
- Contact urology immediately if pain not controlled with oral meds, unable to take po due to nausea/vomiting or development of fever

Conservative Treatment

- Initial trial without surgical intervention if stone likely to pass, pain controlled, minimal obstruction, no associated infection
- Chance of passage (Hubner et al, Eur Urol 24, 1993) <4mm-57%, 4-6mm=35%, >6mm = 8%
- Time to spontaneous passage (Miller and Kane, J Urol 162: 688, 1999).
- Medical expulsive therapy. **Alpha blockers first line**. 29% increase in stone passage rates (Preminger et al, J Urol 178:2418, 2007)
- Some studies suggest increase in stone passage rate with addition of steroids to alpha blockers (optional)
- Appropriate initial management if no absolute indication for immediate intervention and stone <1cm.
- **Strain urine**
- **No indication for routine antibiotics in absence of infection**
- **Followup appointment** (timeframe?) with followup imaging(if stone not passed in reasonable timeframe)
- Contact urology immediately if pain not controlled with oral meds, unable to take po due to nausea/vomiting or development of fever.

Surveillance and Follow up:

- Should schedule an appointment with a Urologist within 2 weeks if stone has not passed. Should also receive follow up imaging with KUB if stone is visible on scout films either renal ultrasound or low dose CT (possible limited only to pelvis for distal stone) if stone is not visible on scout.

Time to Stone Passage and Chance of Intervention

Stone Size	Time to passage (d)	Need to intervene
<=2mm	4.5-8	5%
2-4mm	7-14.5	17%
>4mm	5.5-53	50%

- **Chance of Passage <4mm-57%, 4-6mm=35%, >6mm = 8%**

References:

American Urological Association Guideline, Management of Ureteral Calculi: EAU/AUA Nephrolithiasis Panel, 2007. Validity confirmed 2010

CLINICAL EFFECTIVENESS PROTOCOLS FOR IMAGING IN THE MANAGEMENT OF URETERAL CALCULOUS DISEASE: AUA TECHNOLOGY ASSESSMENT, 2012

American Urological Association Guideline, Management of Ureteral Calculi: EAU/AUA Nephrolithiasis Panel, 2007. Validity confirmed 2010