### Article Citation:
The article cited is Coll et al. Relationship of Spontaneous Passage of Ureteral Calculi to Stone Size and Location as Revealed by Unenhanced Helical CT. *ARJ: 178, January 2002.*

### Country(ies):
USA

### Funding Source(s):
X None Stated

### Purpose

#### Research Question(s):
Does the use of unenhanced CT to determine the size and location of ureterolithiasis change the rates of spontaneous passage, which had previously been determined with urography?

None Stated

#### Hypotheses:
X None Stated

#### Study Purpose:
Determine the relationship between stone size and location as identified on unenhanced CT to the rate of spontaneous passage

### Methods

#### Study Design:
Retrospective review

#### Outcome(s) [or Dependent Variable]:
Spontaneous passage of ureterolithiasis

#### Independent Variable:
Stone size and location

#### Ethics Review:
IRB Review

#### Research Setting:
January 1994-June 1996 at unknown number of hospitals
### Study Subjects:
Patients, age 18y/o or older, with acute flank pain who underwent unenhanced CT during above time period

### Inclusion Criteria:
Findings on CT to suggest acute ureteral obstruction by solitary stone

### Exclusion Criteria:

### Study Interventions:
None

### Study Groups:

440 patients underwent CT for acute flank pain
Only 172 had findings of acute ureteral obstruction caused by a solitary stone in the ureter on CT:
- 115 stones passed spontaneously
- 57 patients required intervention

### Instruments/Measures Used:
Imaging was performed with HiSpeed Advantage CT scanner with axial images obtained from the top of the kidneys to the bladder using a 5-mm slice thickness, a pitch of 1 and a reconstruction interval of 5mm

### Data Collection:
CT images were interpreted together by a senior GU radiologist and a senior radiology resident
Stones were measured by the maximal diameter within the plane of the axial CT
Stones deemed to require intervention included undergoing ureteroscopy, percutaneous nephrostomy or extracorporeal shock wave lithotripsy

### Data Analysis:

- **A priori sample size calculation?**
  - Yes
  - No
  - Not Described
  - N/A

- **Statistical analyses used:**
  - chi-square

- **Adjustment for potential confounders?**
  - Yes
  - No
  - Not Described
  - N/A

### Results

Study participants:
During the 29 month period, only 172 patients had findings of acute ureteral obstruction caused by a solitary stone in the ureter on CT:
- 115 had stones which passed spontaneously
- 57 patients had stones which required intervention
Brief answers to research questions [key findings]:
- No statistically significant difference in the passage of stones when comparing sizes of stones differing only by 1mm.
- Statistically significant difference when stones were grouped by size into three different groups and groups were compared: Stones 1-4mm pass spontaneously 78% of the time while stones 5-7mm pass spontaneously 60% on the time, and stones 8-10mm only pass spontaneously 39% of the time.
- Proximal ureteral stones passed spontaneously 48% of the time, mid ureteral stones passed 60% of the time, distal stones passed 75% of the time and UVJ stones passed 79% of the time.
- Likelihood of spontaneous passage based on location was only statistically significant between proximal and distal ureter and between UVJ.
- There was no statistically significant difference in rates of spontaneous passage by size and location except for at the UVJ.
- No stones larger than 10mm passed spontaneously.

Additional findings:
Similar rates of passage as those previously reported when using radiography for determination of stone size and location were found.

Limitations:
There was a discussion about CTs revealing stones that may not be readily identifiable on radiography including stones smaller than 1mm and those composed of radiographically occult materials; however, there were not any stones measured at less than 1mm and the composition of the stones was not reported.

Clinical Implications
Applicable? Yes
Feasible? Yes
Clinically relevant? Yes

Comments:

Level of evidence generated from this study
☐ Ia: evidence obtained from meta-analysis of randomized controlled trials
☐ Ib: evidence obtained from at least one randomized controlled trial
☐ IIa: evidence obtained from at least one well-designed, controlled study without randomization
☐ IIb: evidence obtained from at least one other type of well-designed quasi-experimental study
☐ X III: evidence obtained from a well-designed, non-experimental study
☐ IV: expert committee reports; expert opinion; case study; case report

Additional Comments/Discussion/Notes