Spontaneous passage rate of ureteral stones and predictive factors after prestenting.

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Introduction

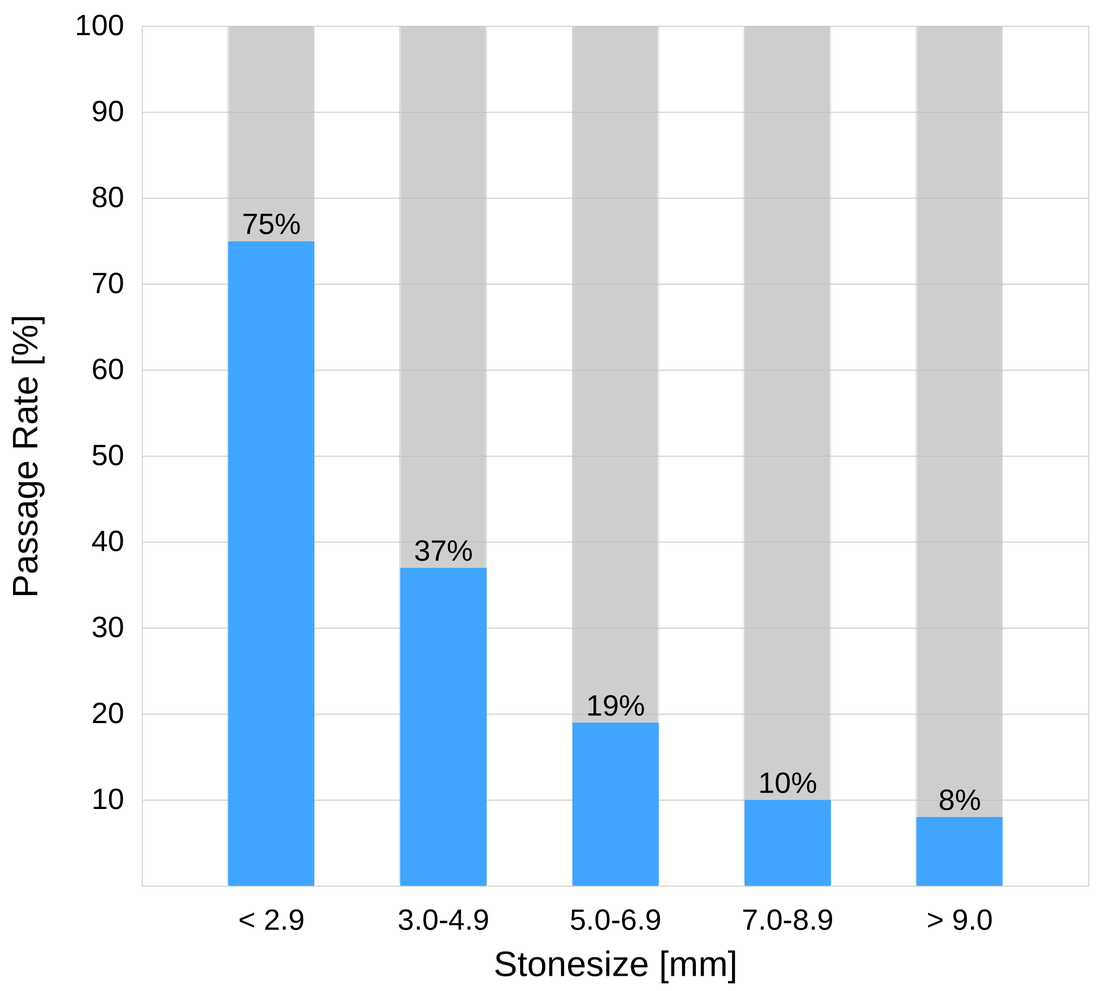
Patients presenting with ureteral stones often require an ureteral stent as temporary solution due to infections, pain management or preparation before ureterorenoscopy[1]. Stones can pass spontaneously along an ureteral stent but the currently available data is limited[2]. As knowledge on passage of ureteral stones is essential for subsequent choice of diagnostic and therapeutic interventions, we aimed to assess the frequency and predictive factors of stone passage with indwelling ureteral stent.

Methods

We retrospectively reviewed all patients treated with ureteral stenting for urolithiasis diagnosed by CT scan from January 2015 to August 2020. Subsequent preoperative CT or results of ureterorenoscopy were analyzed to ascertain passage. We defined the stone size by three-dimensional maximum diameter measurement in CT imaging. Local ethics board approved the study. The primary endpoint was the spontaneous passage rate. We used multivariate logistic regression analysis to identify predictive factors.

Results

Overall, we included 401 patients who received stenting for ureteral stones. Median follow-up time between the interventions was 26 days (IQR 22-31). The allover passage rate was 23.7% (n=95) with a median stone diameter of 4.7mm (IQR 3.3-5.6mm). The rate for passage in a stone with maximum diameter of 0-2.9mm, 3-4.9mm, 5-6.9mm, 7-8.9mm and > 9mm was 75%, 37.1%, 19.1%, 10.3%, 8.2% respectively (Fig. 1). Location (OR 1.63, CI 1.31-2.06, p<0.001), maximum stone diameter (OR 1.31, CI 1.11-1.55, p=0.002), stone volume (OR 1.01, CI 1.00-1.02, p=0.008) and stone density (OR 1.002, CI 1.001-1.003, p<0.001) were independent predictors for passage. The passage rate of stones in the distal, medial and proximal ureter were 70.8%, 12.5% and 16.7% respectively. Medical expulsion therapy with tamsulosin, use of non-steroidal anti-inflammatory or antibiotic drugs and size of ureteral stent showed no impact on the rate of passage.



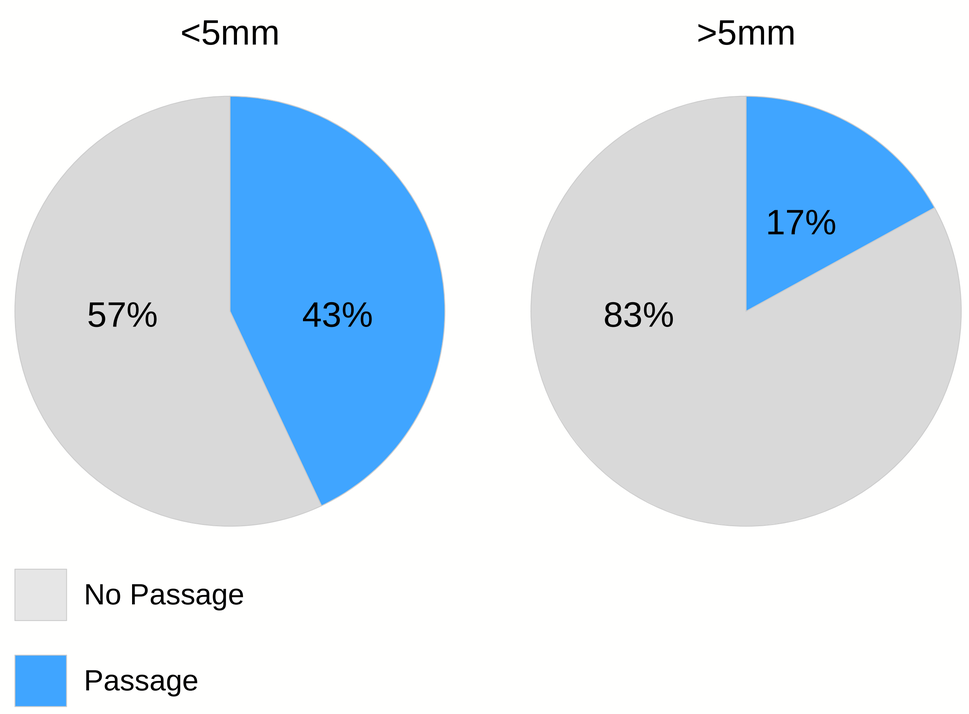


Fig 1: Spontaneous passage corresponding maximal stone diameter

Conclusion

- 43% of stones with a maximal diameter of > 5mm showed spontaneous passage after pre-stenting
- Independent factors of spontaneous passage were stone size, - location, and - density
- The date allows evidence based patient information and facilitates further treatment decisions
- Repeated imaging should be considered in selected patients to diminish unnecessary surgeries

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1. Baumgarten L, et al. (2017) Spontaneous passage of ureteral stones in patients with indwelling ureteral stents. Can J Urol 24:9024–9029
2. Kuebker JM, et al. (2018) Predictors of spontaneous ureteral stone passage in the presence of an indwelling ureteral stent. Urolithiasis 47:395-400

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