TUL & LAPAROSCOPY IN UROLITHIASIS

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Introduction

- The primary goal of is to achieve maximal stone clearance with minimal morbidity.
- Four minimally invasive treatment modalities are available: SWL, PNL, ureteroscopy, and laparoscopic stone surgery.
- Recent advancements in endoscopic technology and surgical technique have dramatically reduced the need for open surgical procedures to treat patients with renal and ureteral calculi.

Introduction

- Management of small stones:
  - Most small urinary calculi will pass spontaneously .
  - The presence of infection in an obstructed upper urinary tract is dangerous and is an indication for urgent surgical intervention.

Introduction

- The surgical management of urinary stone disease has evolved from primarily an open surgical approach to include various minimally invasive options. Increasing experience with shock wave lithotripsy (SWL), ureteroscopy(URS) and percutaneous stone removal(PCNL).

- Nevertheless, patients may still require open stone surgery, including those in whom SWL or endourologic methods fail or who need simultaneous reconstructive treatment of other urinary tract pathological conditions. These patients, who are otherwise candidates for open surgery, form the principal population that may benefit from laparoscopic surgery in reducing morbidity and hastening recovery

Introduction

- About 80% to 85% patients can be treated with SWL.

- Factors associated with poor stone clearance rates:
  1. large renal calculi (mean, 20 mm),
  2. stones within dependent or obstructed portions of the collecting system,
  3. stone composition (mostly calcium oxalate monohydrate and brushite),
  4. obesity or a body habitus that inhibits imaging,
  5. unsatisfactory targeting of the stone.

Ureteral Stone

- **Medical expulsive therapy (MET)**. MET is most effective at treating small distal ureteral stones.

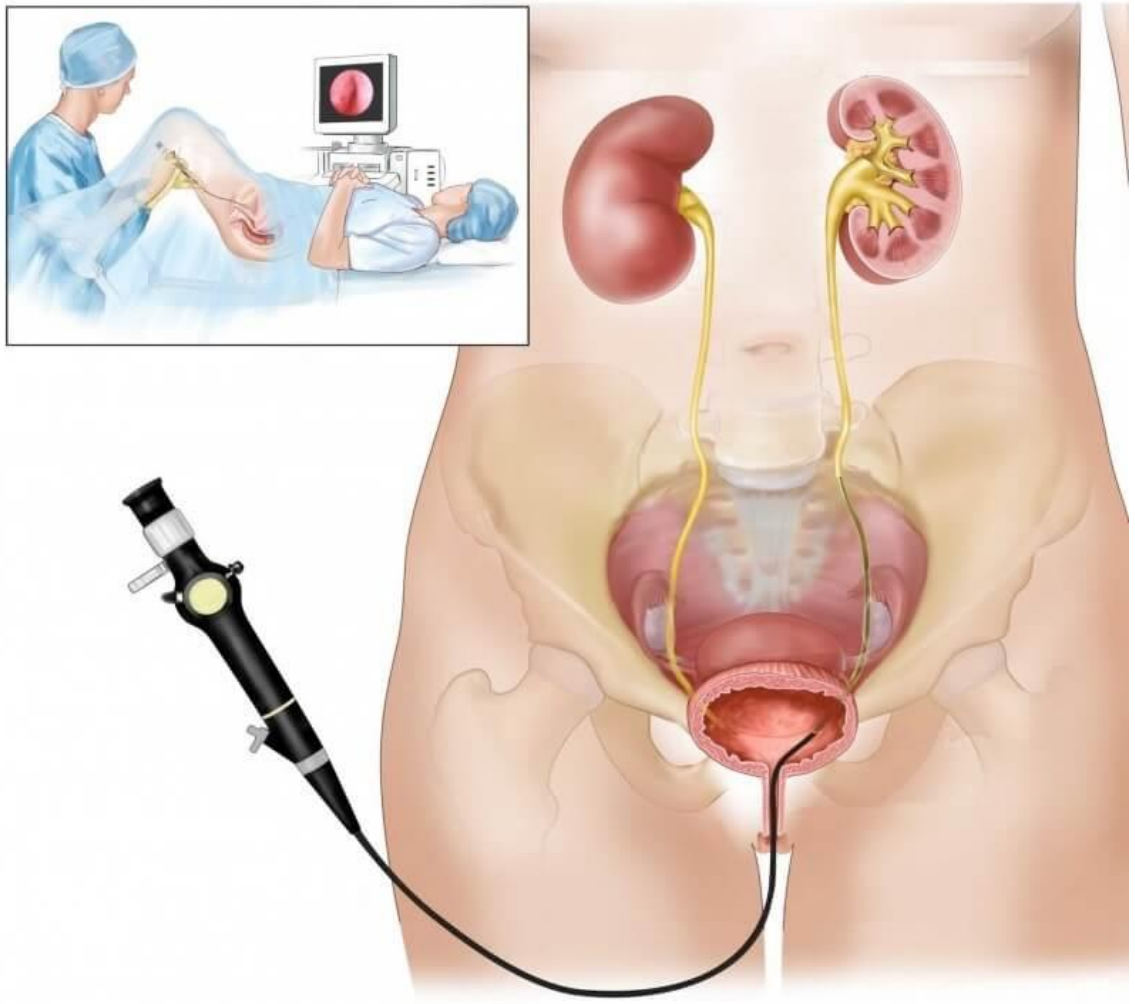
- **Shock wave lithotripsy**. This procedure uses high-energy shock (sound) waves to break up stones in your ureters.

- **Ureteroscopy**. A urologist inserts a long, thin tube with a camera (ureteroscope) into your urethra. They feed the ureteroscope through your bladder and into your ureter.

- **Percutaneous nephrolithotomy**.

What is TUL ?

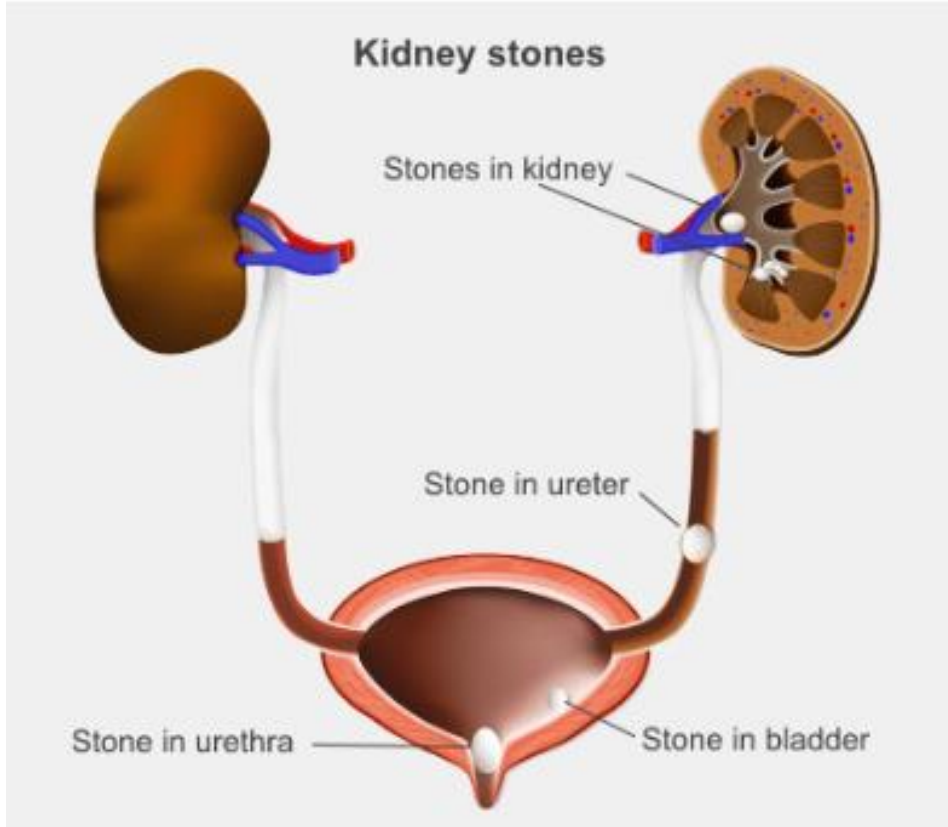
Transurethral lithotomy is a common method by which a stone can be removed through a special telescope, or in special cases, a laser can be used to break the stone into very small portions.
Transurethral lithotomy (TUL) is often performed for urinary stones.



Renal colic....

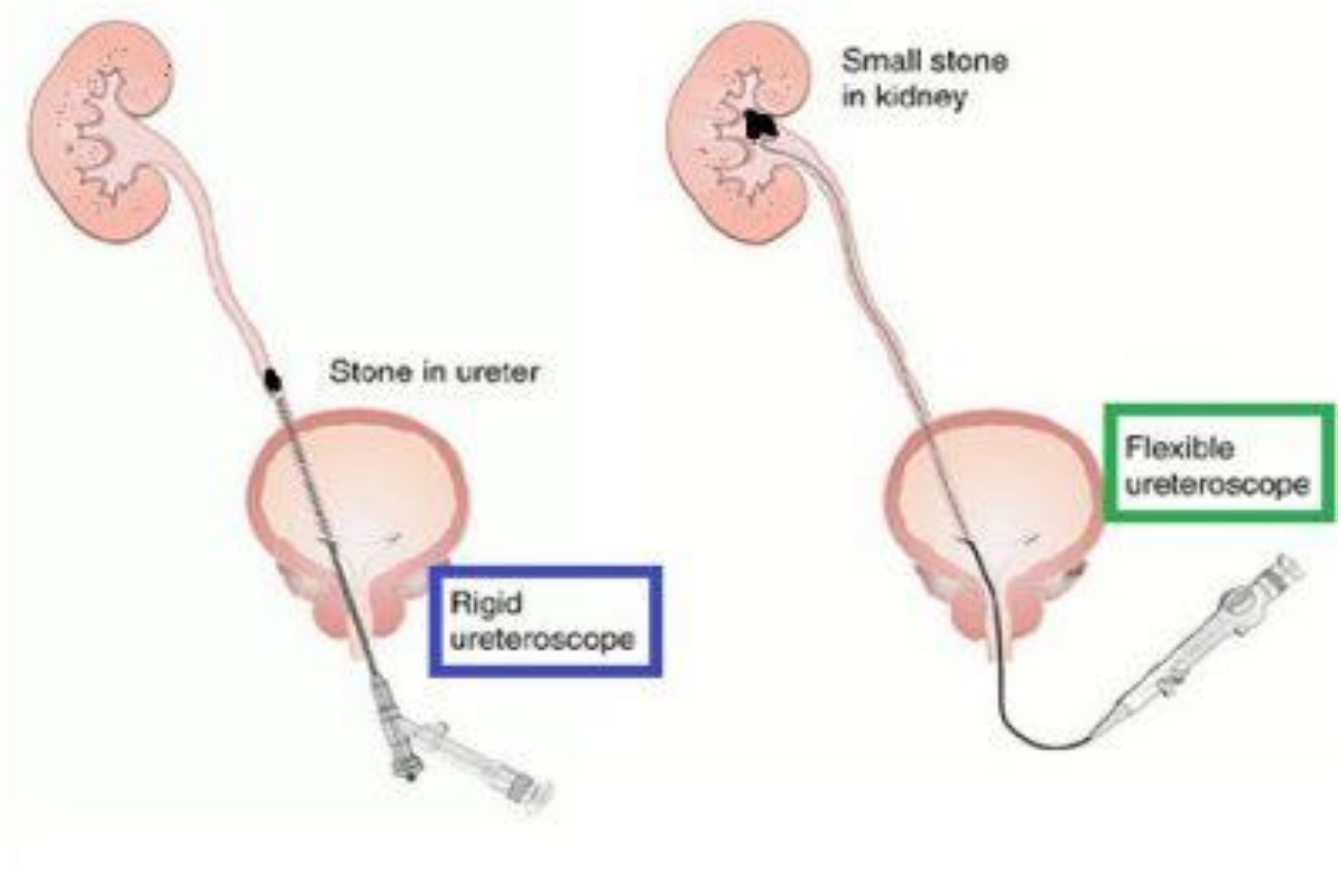
- **Indications for Intervention to Relieve Obstruction and/or Remove the Stone:**

  - Pain that fails to respond to analgesics.
  - Associated fever.
  - Renal function is impaired because of the stone (solitary kidney obstructed by a stone, bilateral ureteric stones,)
  - Obstruction unrelieved for >4 weeks


Kidney stones
Stones in kidney
Stone in ureter
Stone in urethra
Stone in bladder

- The early 1980s saw modelling of the first semi-rigid ureteroscope and its application to remove ureteric calculi for the first time harnessing separate optic and working channels.

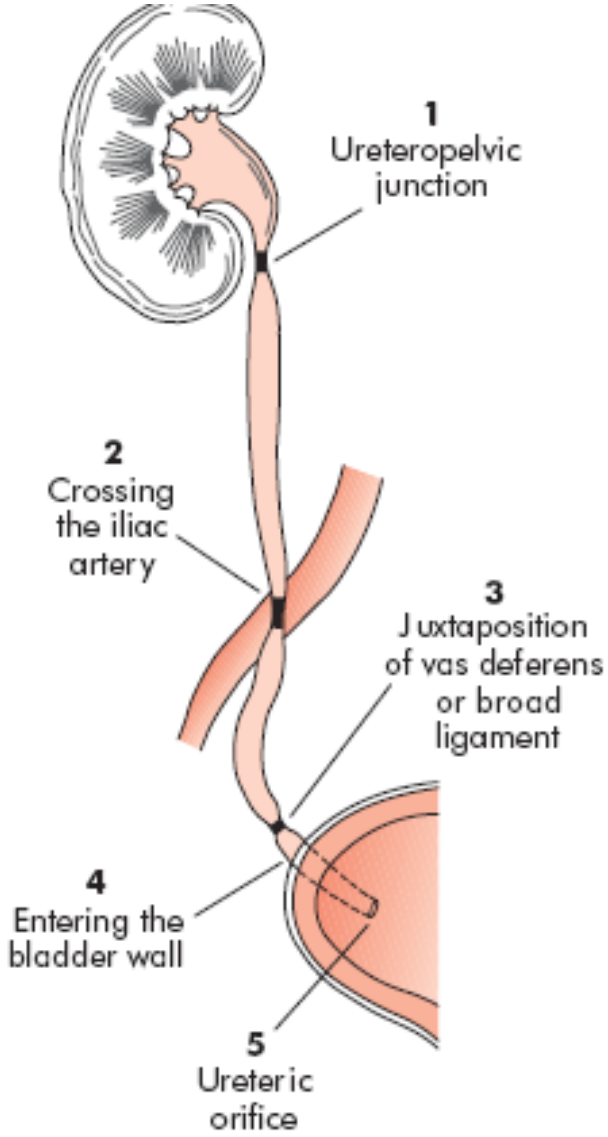
- EAU guidelines recommend URS for both proximal and distal ureteric stones. Furthermore, it is recommended as the first line in cases of stones >10mm size. In contrast to its counterparts, there are no reported contraindications to URS.

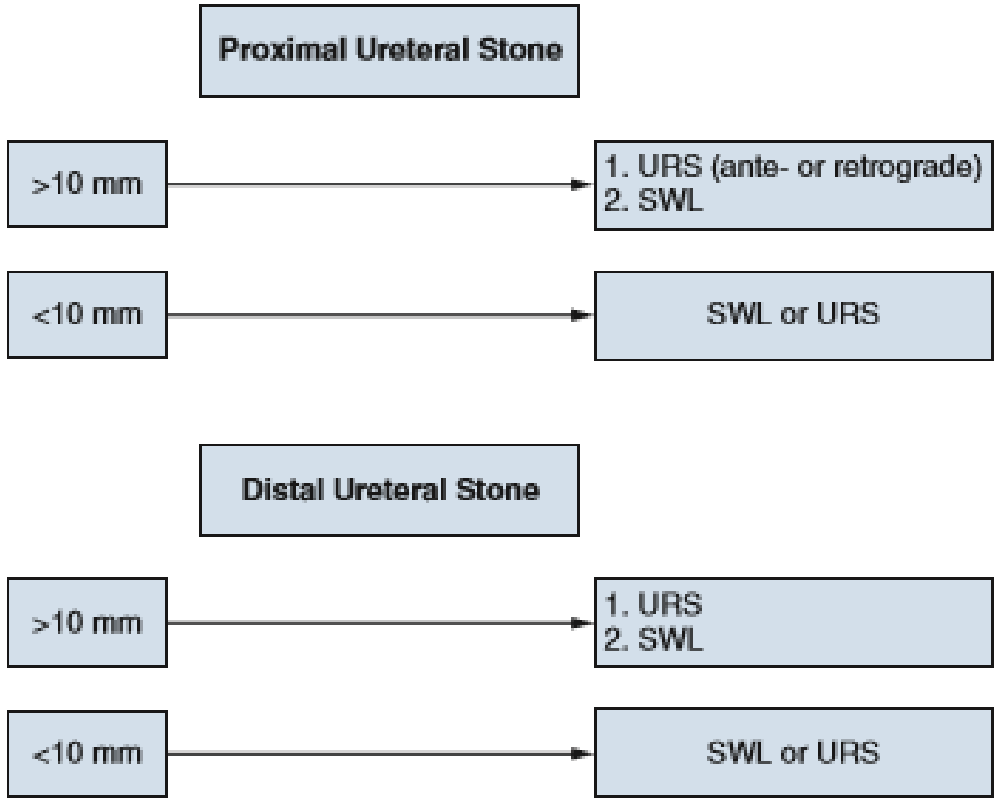

Stone in ureter
Rigid ureteroscope
Small stone in kidney
Flexible ureteroscope

Impaction

- There are five sites of narrowing where the stone may be arrested

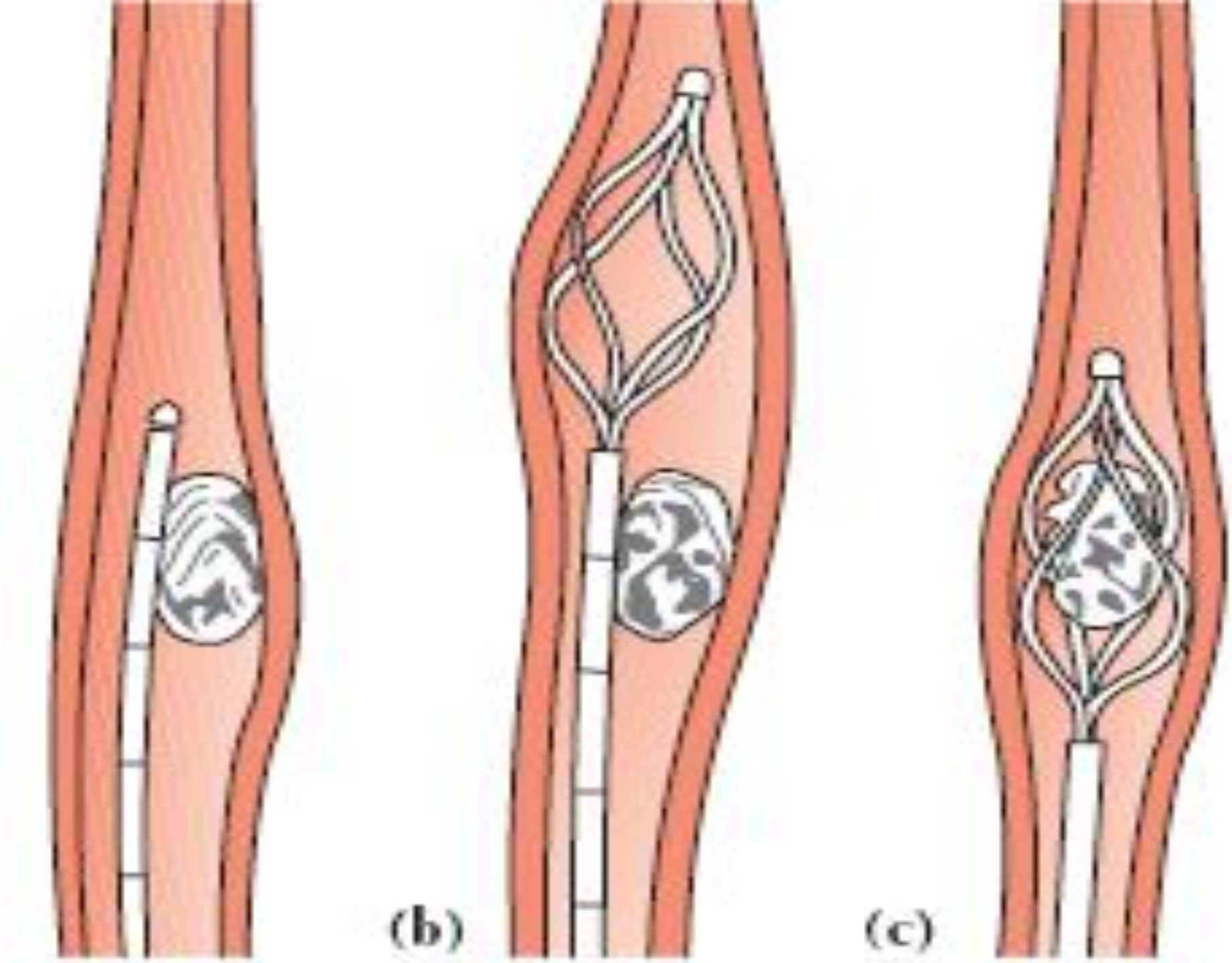
What are those?

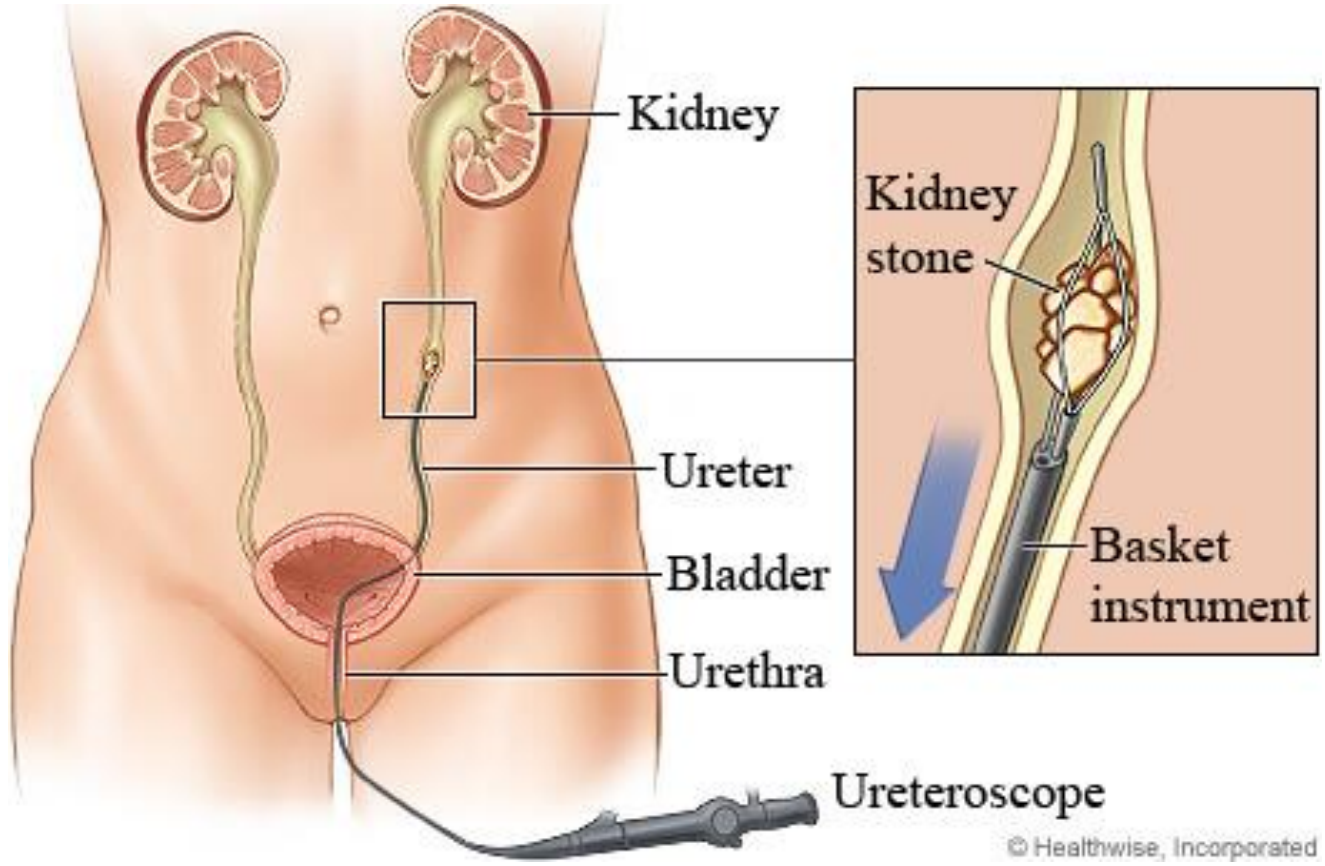




**Upgraded following panel consensus.*

Fig. 93.13. Treatment algorithm: ureteral stones. *SWL*, Shock wave lithotripsy; *URS*, ureterorenoscopy. (Modified from Turk et al.: *EAU Guidelines on urolithiasis*, 2017.)


(b)
(c)


Kidney
Ureter
Bladder
Urethra
Ureteroscope
Kidney stone
Basket instrument
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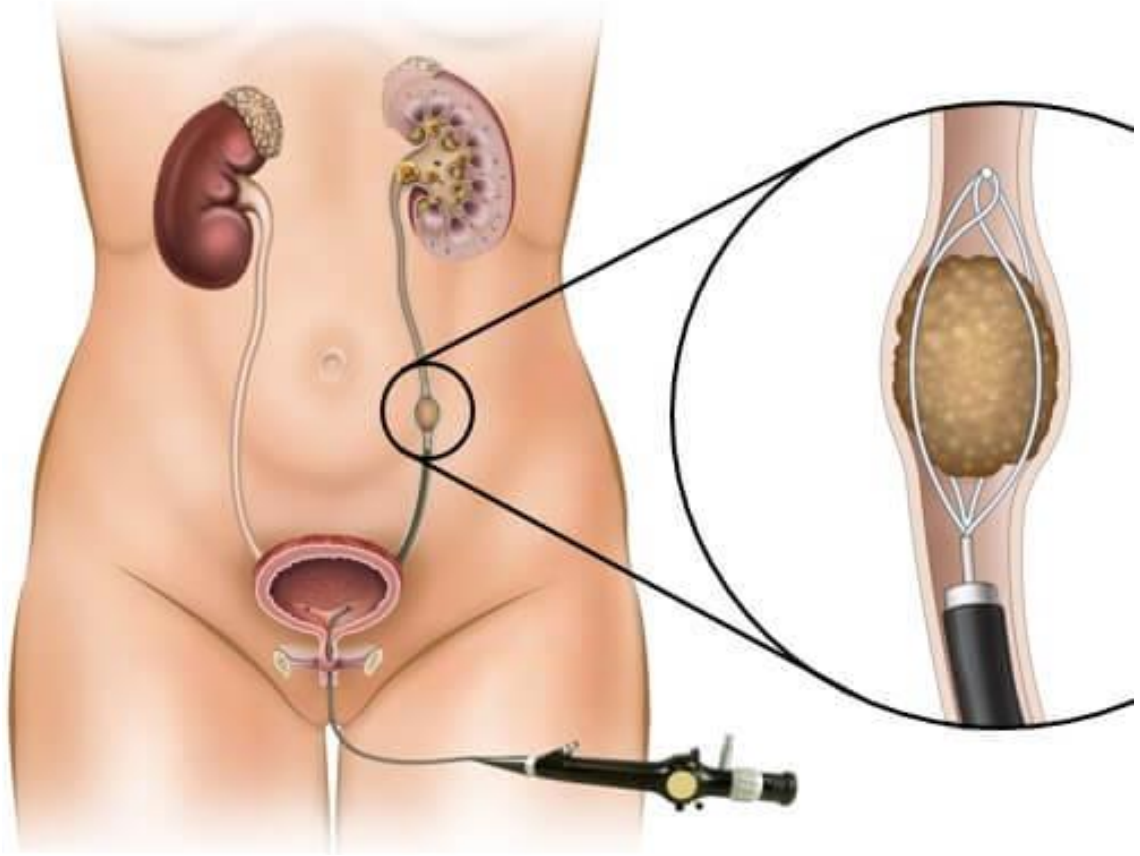
Primary vs Delayed URS

complication

- The most frequently reported complications associated with URS are pain and infection.
- Perforation
- Stricture
- Submucosal Stone and Lost Stone
- Avulsion

Avulsion



Stent

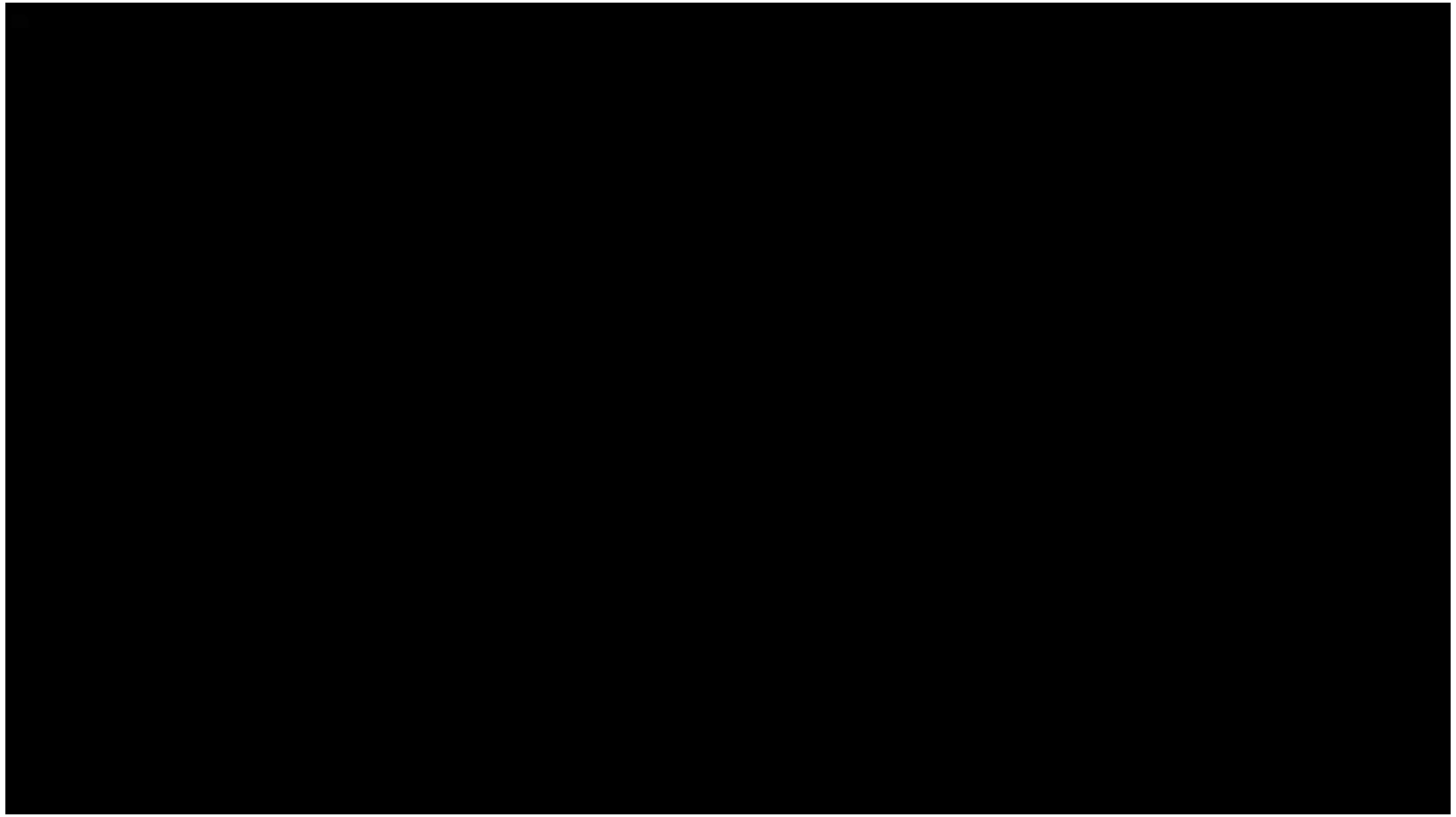
- Following URS, patients without renal impairment, abnormal contralateral kidney, ureteric injury, ureteric stricture or anatomical anomaly should not receive routine ureteral stenting.
- To reduce stent-related morbidity, the AUA guidelines recommend three to seven days of stenting following an uncomplicated ureteroscopic stone intervention.
- The use of antimuscarinic agents and alpha blockers have shown to reduce stent related discomfort in many clinical trials.

Laparoscopy

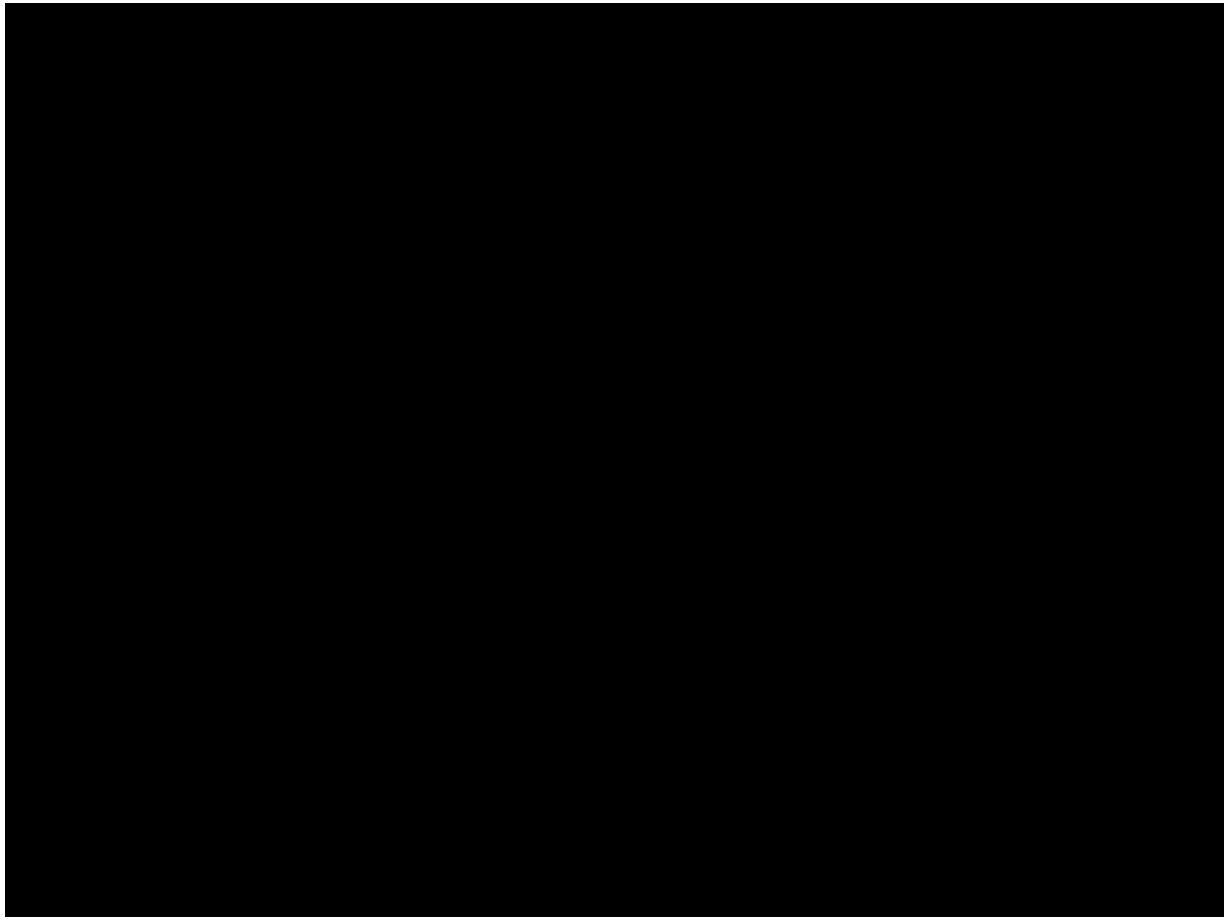
Laparoscopy

- Laparoscopic pyelolithotomy
- Laparoscopic anatrophic nephrolithotomy
- Laparoscopic pyelolithotomy with pyeloplasty
- Laparoscopic assisted percutaneous nephrolithotomy in ectopic kidneys
- Laparoscopic management of ureteric calculi

Laparoscopic Pyelolithotomy (Retro)



Laparoscopic anatrophic nephrolithotomy



Laparoscopy of UPJO with stone

THANK YOU

3.4.6.1. Summary of evidence and guidelines for retrograde URS, RIRS and antegrade ureteroscopy

Summary of evidence	LE
In uncomplicated URS, a post-procedure stent need not be inserted.	1a
In URS (in particular for renal stones), pre-stenting has been shown to improve outcomes.	1b
An α-blocker can reduce stent-related symptoms and colic episodes.	1a
Medical expulsion therapy following Ho:YAG laser lithotripsy accelerates the spontaneous passage of fragments, increases SFRs, and reduces episodes of colic.	1b
The most effective lithotripsy system for flexible ureteroscopy is the Ho:YAG laser.	2a
Pneumatic and US systems can be used with high disintegration efficacy in rigid URS.	2a
Percutaneous antegrade removal of proximal ureter stones, or laparoscopic ureterolithotomy are feasible alternatives to retrograde ureteroscopy, in selected cases.	1b

Recommendations	Strength rating
Use holmium: yttrium-aluminium-garnet (Ho:YAG) laser lithotripsy for (flexible) ureteroscopy (URS).	Strong
Perform stone extraction only under direct endoscopic visualisation of the stone.	Strong
Do not insert a stent in uncomplicated cases.	Strong
Offer medical expulsive therapy for patients suffering from stent-related symptoms and after Ho:YAG laser lithotripsy to facilitate the passage of fragments.	Strong
Use percutaneous antegrade removal of ureteral stones as an alternative when shock wave lithotripsy (SWL) is not indicated or has failed, and when the upper urinary tract is not amenable to retrograde URS.	Strong
Use flexible URS in cases where percutaneous nephrolithotomy or SWL are not an option (even for stones > 2 cm). However, in this case there is a higher risk that a follow-up procedure and placement of a ureteral stent may be needed.	Strong