

DISEASE MANAGEMENT III:

SPECIFIC STONE MANAGEMENT OF RENAL STONES

The natural history of small, non-obstructing asymptomatic calculi is not well defined, and the risk of progression is unclear. There is still no consensus on the follow-up duration, timing, and type of intervention.

Conservative treatment (observation)

Observation of renal stones, especially in calyces, depends on their natural history. The recommendations provided are not supported by high-level literature.

Pharmacological treatment of renal stones

Dissolution therapy seems to be an option for uric acid stones.

Indications for stone removal of renal stones

- stone growth
- stones in high-risk patients for stone formation
- obstruction caused by stones
- infection
- symptomatic stones (e.g., pain or haematuria)
- patient preference
- comorbidity
- the social situation of the patient (e.g., profession or traveling)

LAPAROSCOPY AND OPEN SURGERY

There is a consensus that most complex stones, including partial and complete staghorn stones, should be approached primarily with PCNL. A combined approach with PCNL and RIRS may also be an appropriate alternative.

However, if percutaneous approaches are not likely to be successful, or if multiple endourological approaches have been performed unsuccessfully; open or laparoscopic surgery may be a valid treatment option.

Recommendation	Strength rating
Offer laparoscopic or open surgical stone removal in rare cases in which shock wave lithotripsy, retrograde or antegrade ureteroscopy and percutaneous nephrolithotomy fail, or are unlikely to be successful.	Strong

STEINSTRASSE

Steinstrasse is an accumulation of stone fragments or stone gravel in the ureter and may interfere with the passage of urine. It occurs in 4% of cases of SWL and the major factor in the development of steinstrasse formation is stone size. A major problem of steinstrasse is ureteral obstruction, which may be silent in up to 23% of cases.

Medical expulsion therapy increases the stone expulsion rate and ureteroscopy is effective for the treatment.

Recommendations	Strength rating
Treat steinstrasse associated with urinary tract infection (UTI)/fever preferably with percutaneous nephrostomy.	Weak
Treat steinstrasse when large stone fragments are present with shock wave lithotripsy or ureteroscopy (in absence of signs of UTI).	Weak

MANAGEMENT OF PATIENTS WITH RESIDUAL STONES

Following initial treatment with SWL, URS or PCNL, residual fragments may remain and require additional intervention. For fragments > 4 mm, the studies suggest low spontaneous passage rates and high intervention rates.

Imaging at four weeks seems appropriate to evaluate residual stones. Non-contrast computed tomography (NCCT) has the highest sensitivity to detect small residual fragments after definitive treatment of ureteral or kidney stones.

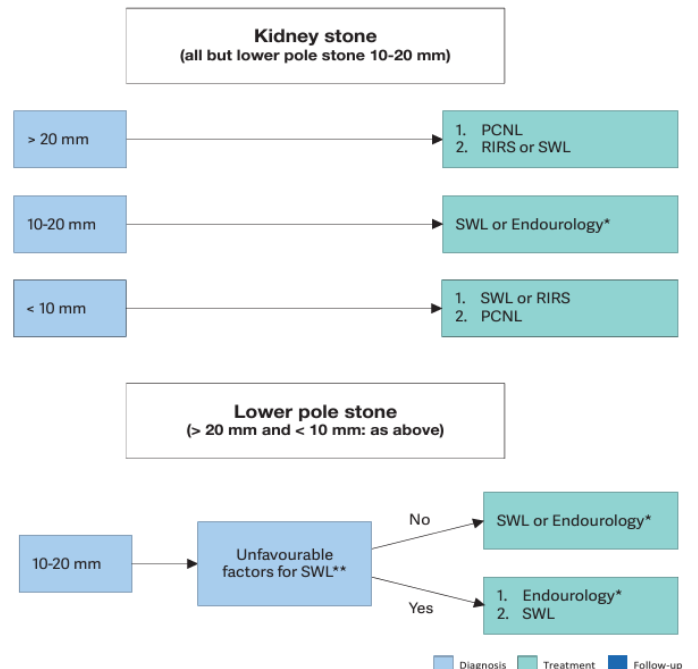
Recommendation	Strength rating
Treat residual fragments > 4 mm.	Weak

MANAGEMENT OF SPECIFIC PATIENT GROUPS

Recommendation	Strength rating
Treat all uncomplicated cases of urolithiasis in pregnancy conservatively (except when there are clinical indications for intervention).	Strong

Recommendations	Strength rating
Offer active treatment for renal stones in case of stone growth, <i>de novo</i> obstruction, associated infection, and acute and/or chronic pain.	Weak
Evaluate stone composition before deciding on the method of removal, based on patient history, former stone analysis of the patient or Hounsfield unit (HU) on unenhanced computed tomography.	Strong
Perform percutaneous nephrolithotomy (PCNL) as first-line treatment of larger stones > 2 cm.	Strong
Treat larger stones (> 2 cm) with flexible ureteroscopy or shock wave lithotripsy (SWL), in cases where PCNL is not an option. However, in such instances there is a higher risk that a follow-up procedure and placement of a ureteral stent may be needed.	Strong
Perform PCNL or retrograde intrarenal surgery for the lower pole, even for stones > 1 cm, as the efficacy of SWL is limited (depending on favourable and unfavourable factors for SWL).	Strong
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Treatment algorithm for renal stones (if/when active treatment is indicated)



*The term 'Endourology' encompasses all PCNL and URS interventions.
PCNL = percutaneous nephrolithotomy; RIRS = retrograde intrarenal surgery; SWL = shock wave lithotripsy; URS = ureteroscopy

Recommendation	Strength rating
Perform percutaneous lithotomy to remove large renal stones in patients with urinary diversion, as well as for ureteral stones that cannot be accessed via a retrograde approach, or that are not amenable to shock wave lithotripsy.	Strong