



Επιστημονική Συνεδρία Ε.Ο.Ε. 19-2-2014

**Λιθίαση Ουροποιητικού
Guidelines στην αντιμετώπιση της λιθίασης**

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Guidelines on Urolithiasis

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Αντιμετώπιση Λιθίασης

Λίθοι ουρητήρα

- Λίγα δεδομένα σχετικά με αυτόματη αποβολή λίθου.

Stone size	Average time to pass	Percentage of passages (95% CI)
< 5 mm (n = 224)		68% (46-85%)
> 5 mm (n = 104)		47% (36-58%)
< 2 mm	31 days	
2-4 mm	40 days	
4-6 mm	39 days	

- Το 95% λίθων έως 4mm θα αποβληθούν περίπου σε 40 ημέρες.

Preminger GM et al, Eur Urol 2007



Αντιμετώπιση Λιθίασης

Λίθοι ουρητήρα

Recommendations	LE	GR
In patients with newly diagnosed ureteral stones < 10 mm, and if active removal is not indicated (Chapter 6), observation with periodic evaluation is an optional initial treatment.	1a	A
Such patients may be offered appropriate medical therapy to facilitate stone passage during observation.*		



Αντιμετώπιση Λιθίασης

Λίθοι νεφρού

Recommendations	GR
Kidney stones should be treated in case of growth, formation of de novo obstruction, associated infection, and acute or chronic pain.	A*
Comorbidity and patient preference need to be taken into consideration when making treatment Decisions.	C
If kidney stones are not treated, periodic evaluation is needed.	A*



Αντιμετώπιση Λιθίασης

Φαρμακευτική θεραπεία (Medical expulsive treatment)

Statement	LE
There is good evidence that MET accelerates spontaneous passage of ureteral stones and fragments generated with SWL, and limits pain (4-16).	1a

Statement	LE
Several trials have demonstrated an α -blocker class effect on stone expulsion rates.	1b

Statement	LE
There is no evidence to support the use of corticosteroids as monotherapy for MET. Insufficient data exist to support the use of corticosteroids in combination with α -blockers as an accelerating adjunct (3,21,34,35).	1b



Αντιμετώπιση Λιθίασης

Φαρμακευτική θεραπεία (Medical expulsive treatment)

Recommendations for MET	LE	GR
For MET, α -blockers are recommended.	1a	A
Patients should be counseled about the attendant risks of MET, including associated drug side effects, and should be informed that it is administered off-label ^{†**} .		A*
Patients, who elect for an attempt at spontaneous passage or MET, should have well-controlled pain, no clinical evidence of sepsis, and adequate renal functional reserve.		A
Patients should be followed once between 1 and 14 days to monitor stone position and be assessed for hydronephrosis.	4	A*



Αντιμετώπιση Λιθίασης

Παράγοντες επιτυχίας

- Μέγεθος λίθου.
- Θέση λίθου.
- Μετά ESWL.
- Μετά ουρητηρολιθοτριψία.
- Ύπαρξη stent.
- Διάρκεια θεραπείας.



Αντιμετώπιση Λιθίασης

Χυμόλυση

Recommendations	GR
In percutaneous chemolysis, at least two nephrostomy catheters should be used to allow irrigation of the renal collecting system, while preventing chemolytic fluid draining into the bladder and reducing the risk of increased intrarenal pressure*.	A
Pressure- and flow-controlled systems should be used if available.	
<i>* Alternatively, one nephrostomy catheter with a JJ stent and bladder catheter can serve as a through-flow system preventing high pressure.</i>	

Recommendations	GR
The dosage of alkalisating medication must be modified by the patient according to urine pH, which is a direct consequence of such medication.	A
Dipstick monitoring of urine pH by the patient is required at regular intervals during the day. Morning urine must be included.	A
The physician should clearly inform the patient of the significance of compliance.	A





Αντιμετώπιση Λιθίασης

ESWL – Παράγοντες

- Μέγεθος – Θέση – Σκληρότητα λίθου.
- Διαστάσεις ασθενούς.
- Επίδοση της ESWL.





Αντιμετώπιση Λιθίασης

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Αντιμετώπιση Λιθίασης

ESWL – Αντενδείξεις

- Εγκυμοσύνη.
- Αιμορραγική διάθεση.
- Ενεργός λοίμωξη.
- Σκελετικές δυσμορφίες – Παχυσαρκία.
- Ανεύρυσμα.
- Απόφραξη περιφερικότερα.



Αντιμετώπιση Λιθίασης

ESWL

Recommendation	LE	GR
Routine stenting is not recommended as part of SWL treatment of ureteral stones.	1b	A

Recommendation	LE	GR
The optimal shock wave frequency is 1.0-1.5 Hz (16).	1a	A

Recommendation	LE	GR
Ensure correct use of the coupling gel because this is crucial for effective shock wave transportation (26).	2a	B

Recommendation	LE	GR
Maintain careful fluoroscopic and/or ultrasonographic monitoring during the procedure.	4	A*



Αντιμετώπιση Λιθίασης

ESWL – Επιπλοκές

Complications		%	Refs.	
Related to stone fragments	Steinstrasse	4 - 7	49-51	
	Regrowth of residual fragments	21 - 59	52	
	Renal colic	2 - 4	48	
Infectious	Bacteriuria in non-infection stones	7.7 - 23	52,53	
	Sepsis	1 - 2.7	52,53	
Tissue effect	Renal	Haematoma, symptomatic	< 1	1,54
		Haematoma, asymptomatic	4 - 19	1,54
	Cardiovascular	Dysrhythmia	11 - 59	52,55
		Morbid cardiac events	Case reports	52,55
	Gastrointestinal	Bowel perforation	Case reports	56-58
		Liver, spleen haematoma	Case reports	58-60





Αντιμετώπιση Λιθίασης

Ενδοουρολογία – Διαδερμική νεφρολιθοτριψία (PCNL)

Recommendations	GR
Ultrasonic, ballistic and Ho:YAG devices are recommended for intracorporeal lithotripsy during PNL.	A*
When using flexible instruments, the Ho:YAG laser is currently the most effective device.	

Recommendation	GR
Preprocedural imaging, including contrast medium where possible or retrograde study when starting the procedure, is mandatory to assess stone comprehensiveness, view the anatomy of the collecting system, and ensure safe access to the kidney stone.	A*

Recommendation	LE	GR
In uncomplicated cases, tubeless (without nephrostomy tube) or totally tubeless (without nephrostomy tube and ureteral stent) PNL procedures provide a safe alternative.	1b	A



Αντιμετώπιση Λιθίασης

Διαδερμική νεφρολιθοτριψία (PCNL) - Επιπλοκές

Complications	Transfusion	Embolisation	Urinoma	Fever	Sepsis	Thoracic complication	Organ injury	Death	LE
(Range)	(0-20%)	(0-1.5%)	(0-1%)	(0-32.1%)	(0.3-1.1%)	(0-11.6%)	(0-1.7%)	(0-0.3%)	1a
N = 11,929	7%	0,4%	0,2%	10,8%	0,5%	1,5%	0,4%		



Αντιμετώπιση Λιθίασης

Ενδοουρολογία – Ουρητηρονεφροσκόπηση (URS)

Recommendation	LE	GR
Short-term antibiotic prophylaxis should be administered (27).	4	A*

Recommendation	GR
Placement of a safety wire is recommended.	A*

Recommendation	LE	GR
Stone extraction using a basket without endoscopic visualisation of the stone (blind basketing) should not be performed.	4	A*

Statement	LE
In uncomplicated URS, a stent need not be inserted.	1a
An α -blocker can reduce stent-related symptoms.	1a



Αντιμετώπιση Λιθίασης

Ουρητηρονεφροσκόπηση (URS) - Επιπλοκές

	Rate (%)
<i>Intraoperative complications</i>	3.6
Mucosal injury	1.5
Ureteral perforation	1.7
Significant bleeding	0.1
Ureteral avulsion	0.1
<i>Early complications</i>	6.0
Fever or urosepsis	1.1
Persistent haematuria	2.0
Renal colic	2.2
<i>Late complications</i>	0.2
Ureteral stricture	0.1
Persistent vesicoureteral reflux	0.1



Αντιμετώπιση Λιθίασης

Ανοικτές επεμβάσεις - Ενδείξεις

Complex stone burden.

Failure of SWL, PNL, or ureteroscopic procedure.

Intrarenal anatomical abnormalities: infundibular stenosis; stone in the calyceal diverticulum (particularly in an anterior calyx); obstruction of the ureteropelvic junction; and stricture if endourologic procedures have failed or are not promising.

Morbid obesity.

Skeletal deformity, contractures and fixed deformities of hips and legs.

Comorbidity.

Concomitant open surgery.

Non-functioning lower pole (partial nephrectomy), non-functioning kidney (nephrectomy).

Patient choice following failed minimally invasive procedures; the patient may prefer a single procedure and avoid the risk of needing more than one PNL procedure.

Stone in an ectopic kidney where percutaneous access and SWL may be difficult or impossible.

For the paediatric population, the same considerations apply as for adults.



Αντιμετώπιση Λιθίασης

Λαπαροσκοπικές επεμβάσεις - Ενδείξεις

Indications for laparoscopic kidney-stone surgery include:

- Complex stone burden
- Failed previous SWL and/or endourological procedures
- Anatomical abnormalities
- Morbid obesity
- Nephrectomy in case of non-functioning kidney.

Indications for laparoscopic ureteral stone surgery include:

- Large impacted ureteral stones
- In cases of concurrent conditions requiring surgery
- When other non-invasive or low-invasive procedures have failed
- For upper ureteral calculi, laparoscopic urolithomy has the highest stone-free rate compared to URS and SWL (31) (LE: 1b).



Αντιμετώπιση Λιθίασης

Recommendations	LE	GR
Laparoscopic or open surgical stone removal may be considered in rare cases in which SWL, URS, and percutaneous URS fail or are unlikely to be successful.	3	C
When expertise is available, laparoscopic surgery should be the preferred option before proceeding to open surgery. An exception is complex renal stone burden and/or stone location.	3	C
For ureterolithotomy, laparoscopy is recommended for large impact stones or when endoscopic lithotripsy or SWL has failed.	2	B





Αντιμετώπιση Λιθίασης

Indications for active removal of ureteral stones (1-3)

Stones with low likelihood of spontaneous passage.

Persistent pain despite adequate analgesic medication.

Persistent obstruction.

Renal insufficiency (renal failure, bilateral obstruction, or single kidney).



Αντιμετώπιση Λιθίασης

Indications for active removal of kidney stones (4)

Stone growth.

Stones in high-risk patients for stone formation.

Obstruction caused by stones.

Infection.

Symptomatic stones (e.G., Pain or haematuria).

Stones > 15 mm.

Stones < 15 mm if observation is not the option of choice.

Patient preference.

Comorbidity.

Social situation of the patient (e.G., Profession or travelling).

Choice of treatment.



Αντιμετώπιση Λιθίασης

Προ Θεραπείας

Recommendation	GR
Urine culture or urinary microscopy is mandatory before any treatment is planned.	A*

Recommendations	LE	GR
Anticoagulation therapy including salicylates should be stopped before stone removal.	3	B
If intervention for stone removal is essential and salicylate therapy should not be interrupted, retrograde ureterorenoscopy is the preferred treatment of choice.		

Statement	LE
In case of severe obesity, URS is a more promising therapeutic option than SWL.	2b

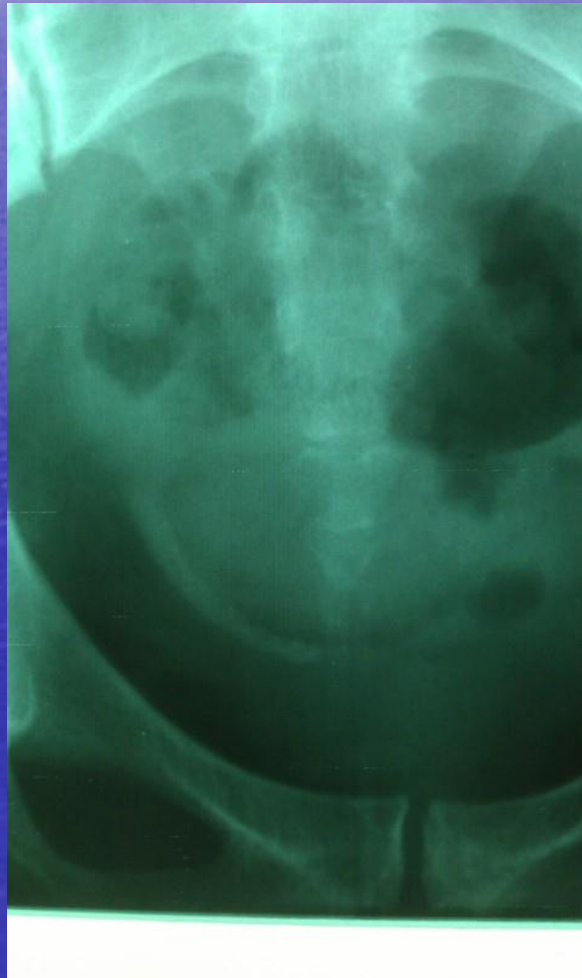
Recommendation	LE	GR
Consider the stone composition before deciding on the method of removal (based on patients history, former stone analysis of the patient or HU in unenhanced CT. Stones with medium density > 1,000 HU on NCCT are less likely to be disintegrated by SWL) (10).	2a	B

Recommendation	GR
Careful monitoring of radiolucent stones during/after therapy is imperative.	A*



Αντιμετώπιση Λιθίασης

Steinstrasse (Λιθιασική αλυσίδα) - Θεραπεία





Αντιμετώπιση Λιθίασης

Steinstrasse (Λιθιασική αλυσίδα) - Θεραπεία

Statements	LE
Medical expulsion therapy increases the stone expulsion rate of steinstrasse (18).	1b
When spontaneous passage is unlikely, further treatment of steinstrasse is indicated.	
SWL is indicated in asymptomatic and symptomatic cases, with no evidence of UTI, when large stone fragments are present (18).	
Ureteroscopy is equally effective as SWL for treatment of steinstrasse (21,22).	3
Placement of a percutaneous nephrostomy tube or ureteral stent is indicated for symptomatic ureteric obstruction with/without UTI.	

Recommendations	LE	GR
Percutaneous nephrostomy is indicated for steinstrasse associated with urinary tract infection/fever.	4	C
Shockwave lithotripsy is indicated for steinstrasse when large stone fragments are present.	4	C
Ureteroscopy is indicated for symptomatic steinstrasse and treatment failure.	4	C



Αντιμετώπιση Λιθίασης

Νεφρικοί Λίθοι - Θεραπεία

Factors that make SWL less likely

Shockwave-resistant stones (calcium oxalate monohydrate, brushite, or cystine).

Steep infundibular-pelvic angle.

Long lower pole calyx (> 10 mm).

Narrow infundibulum (< 5 mm).

Recommendations

SWL remains the method of first choice for stones < 2 cm within the renal pelvis and upper or middle calices. Larger stones should be treated by PNL.

Flexible URS cannot be recommended as first-line treatment, especially for stones > 1.5 cm in the renal pelvis and upper or middle calices, for which SFR after RIRS is decreasing, and staged procedures become necessary.

For the lower pole, PNL or RIRS is recommended, even for stones > 1.5 cm, because the efficacy of SWL is limited (depending on favourable and unfavourable factors for SWL).

GR

B*

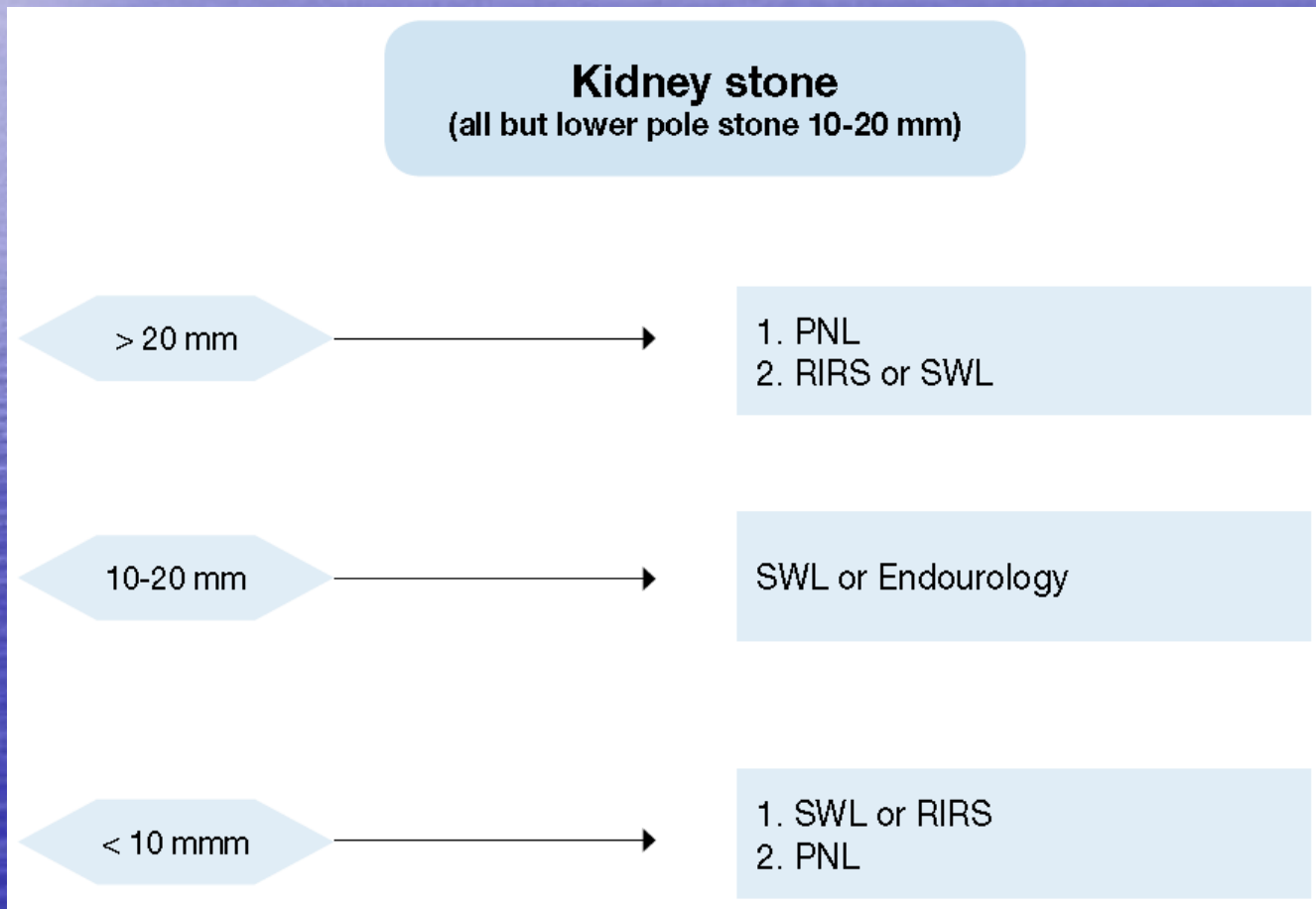
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Αντιμετώπιση Λιθίασης

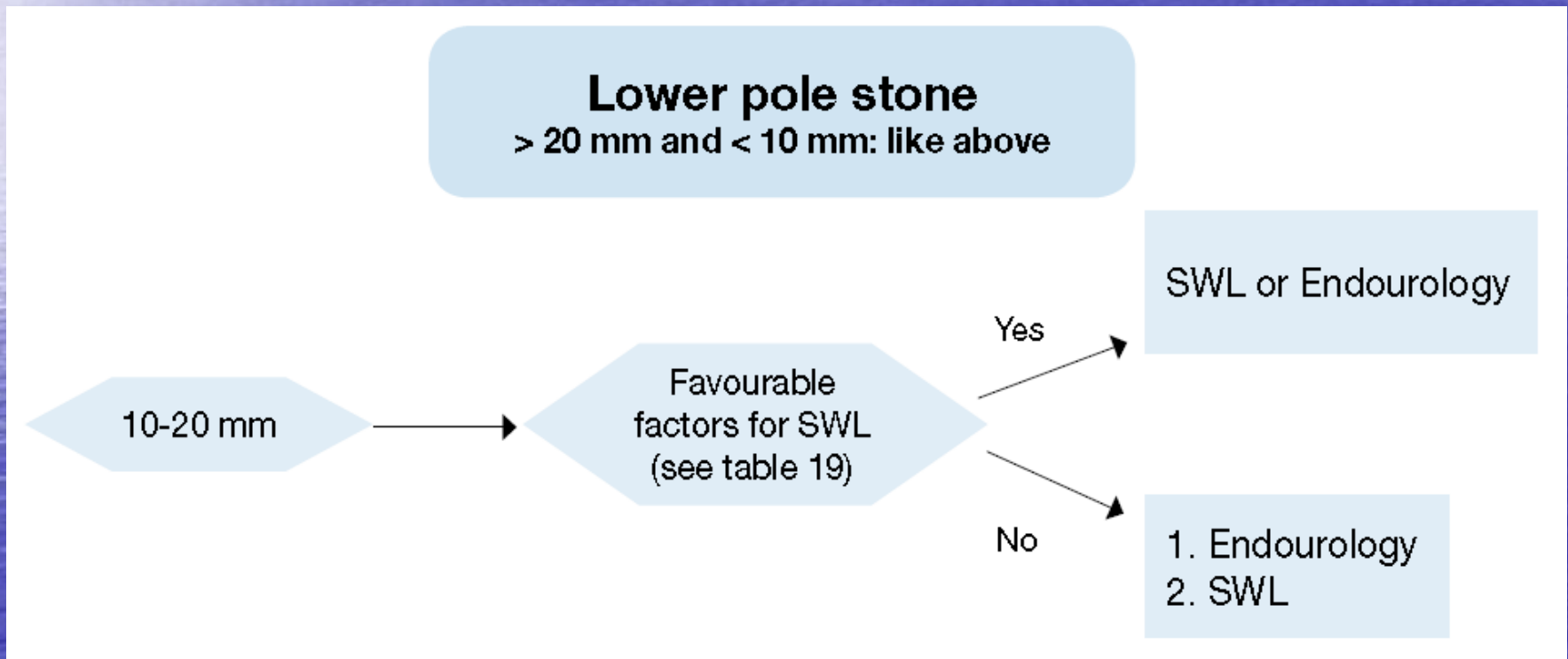
Νεφρικοί Λίθοι - Θεραπεία





Αντιμετώπιση Λιθίασης

Νεφρικοί Λίθοι - Θεραπεία





Αντιμετώπιση Λιθίασης

Ουρητηρικοί Λίθοι - Θεραπεία

Stone location and size	SWL		URS	
	No. of patients	SFR/95% CI	No. of patients	SFR/95% CI
Distal ureter	7217	74% (73-75)	10,372	93% (93-94)
≤ 10 mm	1684	86% (80-91)	2,013	97% (96-98)
> 10 mm	966	74% (57-87)	668	93% (91-95)
Mid ureter	1697	73% (71-75)	1,140	87% (85-89)
≤ 10 mm	44	84% (65-95)	116	93% (88-98)
> 10 mm	15	76% (36-97)	110	79% (71-87)
Proximal ureter	6682	82% (81-83)	2,448	82% (81-84)
≤ 10 mm	967	89% (87-91)	318	84% (80-88)
> 10 mm	481	70% (66-74)	338	81% (77-85)



Αντιμετώπιση Λιθίασης

Ουρητηρικοί Λίθοι - Θεραπεία

Stone location and size	First choice	Second choice
Proximal ureter < 10 mm	SWL	URS
Proximal ureter > 10 mm	URS (retrograde or antegrade) or SWL	
Distal ureter < 10 mm	URS or SWL	
Distal ureter > 10 mm	URS	SWL

Recommendations	GR
Percutaneous antegrade removal of ureteral stones is an alternative when SWL is not indicated or has failed, and when the upper urinary tract is not amenable to retrograde URS.	A

Recommendation	GR
Treatment choices should be based on stone size and location, available equipment, and patient preference for stone removal.	A





Αντιμετώπιση Λιθίασης

Ειδικές περιπτώσεις

Caliceal diverticulum stones	<ul style="list-style-type: none">• SWL, PNL (if possible) or RIRS.• Can also be removed using laparoscopic retroperitoneal surgery (1-5).• Patients may become asymptomatic due to stone disintegration (SWL) whilst well-disintegrated stone material remains in the original position due to narrow caliceal neck.
Horseshoe kidneys	<ul style="list-style-type: none">• Can be treated in line with the options described above (6.)• Passage of fragments after SWL might be poor.
Stones in pelvic kidneys	<ul style="list-style-type: none">• SWL, RIRS or laparoscopic surgery.• For obese patients, the options are SWL, PNL, RIRS or open surgery.
Stones formed in a continent reservoir	<ul style="list-style-type: none">• Section 10.1.• Each stone problem must be considered and treated individually.
Patients with obstruction of the ureteropelvic junction	<ul style="list-style-type: none">• When outflow abnormality requires correction, stones can be removed by PNL together with percutaneous endopyelotomy or open/laparoscopic reconstructive surgery.• URS together with endopyelotomy with Ho:YAG.• Incision with an Acucise balloon catheter might be considered, provided the stones can be prevented from falling into the pelviureteral incision (7-10).