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British Association of Urological Surgeons standards for management of acute ureteric colic

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Abstract

These guidelines have been developed by the British Association of Urological Surgeons to give a framework to clinicians, based primarily in the UK, for the management of patients presenting acutely with ureteric colic. They have been developed by consensus with reference to the American Urological Association/Endourological Society guidelines on the surgical management of stones and the European Association of Urology guidelines on urolithiasis, and adapted to the logistics of those practicing within the National Health Service. Grades of recommendation and levels of evidence are based upon the system adopted by the European Association of Urology.

Keywords

Guidelines, nephrolithiasis, renal colic, ureteric colic, ureteric stone

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These guidelines have been developed to give a framework to clinicians, based primarily in the UK, for the management of patients presenting acutely with ureteric colic. They have been developed by consensus with reference to the American Urological Association/Endourological Society guidelines on the surgical management of stones[1] and the European Association of Urology (EAU) guidelines on urolithiasis[2] and adapted to the logistics of those practicing within the National Health Service (NHS). Grade of recommendation (Gr) and level of evidence (LE) are based upon the system adopted by the EAU (Tables 1 and 2).[3]

Patients should be given non-steroidal anti-inflammatory drugs (NSAIDs) for analgesia, immediately after initial assessment, unless there are specific contraindications (Gr A)

Immediate pain relief is the primary treatment requirement in patients with suspected acute ureteric colic[4] and should not be deferred by imaging assessment. NSAIDs are effective for pain control and have better analgesic effect than opioids, such that patients treated with NSAIDs are less likely to require further rescue medication in the short term.[5] In addition, opioids have a higher incidence of adverse events, especially vomiting and do not seem to reduce the need for further analgesia.[5] The use of diclofenac and ibuprofen has been associated with an increased incidence of coronary events and this should be taken into consideration when prescribing them, aiming for the lowest effective dose used for the shortest duration being the aspiration.[6]

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Table 1. Level of evidence.[3]

Level	Type of evidence
1a	Evidence obtained from meta-analysis of randomised trials.
1b	Evidence obtained from at least one randomised trial.
2a	Evidence obtained from one well-designed controlled study without randomization.
2b	Evidence obtained from at least one other type of well-designed quasi-experimental study.
3	Evidence obtained from well-designed non-experimental studies, such as comparative studies, correlation studies and case reports.
4	Evidence obtained from expert committee reports or opinions or clinical experience of respected authorities.

Table 2. Grade of recommendation.[3]

Grade	Nature of recommendation
A	Based on clinical studies of good quality and consistency addressing the specific recommendations and including at least one randomised trial.
B	Based on well-conducted clinical studies, but without randomised clinical trials.
C	Made despite the absence of directly applicable clinical studies of good quality.

Investigations in all patients should include (Gr A):[2]

- Urine dipstick and culture dependent on dipstick findings
- Serum creatinine and electrolytes (including estimated glomerular filtration rate (eGFR)), calcium, urate, full blood count (FBC) and C-reactive protein (CRP).
- A clotting screen if percutaneous intervention is likely or planned.
- Blood cultures if the patient is pyrexial >38°C, or has signs of systemic inflammatory response syndrome (SIRS) or sepsis.

A computed tomography of the kidneys, ureter and bladder (CT KUB) should be performed within 14 h of admission for the standard (non-pregnant adult) patient to make the diagnosis and help plan treatment (LE 1a, Gr A)[7]

In patients with fever and/or other evidence of sepsis, patients with a solitary kidney, or when diagnosis is uncertain, immediate imaging is indicated (LE 4, Gr A).

Non-contrast enhanced CT (CT KUB) has become the standard for the diagnosis of acute ureteric colic with a high sensitivity of 97% for ureteric stones and a specificity of 95%.[8] In addition, CT KUB can determine stone characteristics, such as Hounsfield Unit (HU) density, size and skin-to-stone distance, all of which may affect the choice of treatment modality. Furthermore, when stones are absent it can identify other causes of abdominal pain.[7]

If the patient is a known stone former, particularly if a CT KUB has been performed within the last three months, a KUB ultrasound and/or an X-ray KUB may suffice.

Patients should not be routinely commenced on medical expulsive therapy (MET). Patients should be counselled regarding MET and informed that α-blockers are administered off-label (LE 1b, Gr A)

Efficacy of α-blockers, as part of expectant management of patients with ureteric stones remains controversial and debatable. A recent, large, high quality trial questioned the clinical efficacy of tamsulosin and nifedipine which showed no significant impact on either requirement for intervention at four weeks, or pain limitation.[9]

In contrast, a recently published meta-analysis and systematic review of randomised controlled trials (RCTs) advocates the use of α-blockers for patients amenable to conservative management, with greatest benefit amongst those with larger stones.[10]

For symptomatic ureteric stones, primary treatment of the stone should be the goal (LE 1b) and should be undertaken within 48 h of the decision to intervene

Primary treatment may be with shock wave lithotripsy (SWL) or ureteroscopy and will be determined by the stone characteristics and location, patient, surgical and local factors.[2]

Compared to SWL, ureteroscopy for proximal ureteric stones is associated with higher stone-free rates and lower re-treatment rates, at the cost of a higher complication rate and longer hospital stay.[11] Larger stones have higher stone-free rates and are stone-free sooner with ureteroscopy compared to SWL.[12]

Where primary treatment of the stone is not immediately feasible, a stent may be inserted.[15] Subsequent ureteroscopy should be undertaken within four weeks, to minimise patient morbidity (LE 4, Gr C).[13] SWL should not be routinely undertaken with a stent in situ (LE 1b, Gr A).[14]

Ureteric stenting should not be routinely performed before primary ureteroscopy. However, if active primary removal of ureteric stones is indicated after a joint decision-making approach and SWL or ureteroscopy are not readily feasible, then retrograde stenting may be undertaken. Prestenting facilitates subsequent ureteroscopic management of stones, improves stone-free rates and reduces complications.[15] Stenting may be associated with higher morbidity, pre- and post-ureteroscopy.[13] Routine use of stents before SWL does not improve stone-free rates and does not reduce the incidence of complications and is therefore not recommended.[14]

A patient with sepsis and an obstructing stone should undergo urgent decompression of the collecting system, with a nephrostomy tube or a stent. This should be performed with broad spectrum antibiotic cover and should be undertaken urgently, within a maximum of 12 h, although in some patients it will need to be performed more urgently. Definitive stone treatment should be delayed until sepsis has resolved (LE 1b, Gr A)[16,17]

A stone causing obstruction associated with infection is a life-threatening emergency. Urgent decompression of the collecting system is indicated, as those patients not drained have a higher mortality.[16] There is no evidence to support the superiority of nephrostomy over stents in this clinical scenario.[17] The decision of which mode of drainage to use should be based on logistical factors, surgeon preference and patient and stone characteristics.

A patient with a ureteric stone can be discharged if the following conditions are met (LE 1a, Gr A)

- There is no evidence of sepsis.
- Renal function is not acutely impaired.
- The ureteric stone is unilateral.
- There is a normal contralateral renal unit.
- The pain is well controlled with oral and/or per rectum analgesia.

Observation is reasonable in patients with ureteric stones, provided they meet the criteria above, are well informed and develop no complications.[2]

Patients with stones larger than 10 mm can be discharged if the above conditions are met, but a date for definitive intervention within four weeks of discharge should be planned at presentation (LE 4, Gr C)

Stones larger than 10 mm are unlikely to pass spontaneously.[18] An exact cut-off size for stones that are likely to pass spontaneously cannot be provided. However, due to the low likelihood of such large stones passing spontaneously, the panel considers that definitive treatment should be planned at first presentation. Treatment should be at a maximum of four weeks from presentation, to reduce the risk of morbidity, including loss of renal function and the decision to intervene should not be delayed until outpatient review.

In patients managed expectantly, clinic review should be undertaken at a maximum time of four weeks with imaging to assess for the ongoing presence of the stone and/or hydronephrosis (LE 4, Gr C)

Repeat imaging can include an X-ray KUB if the stone is radiodense, ultrasound KUB or CT KUB, depending upon the initial stone location and characteristics, taking into account the ALARA (as low as reasonably achievable) principle to limit radiation exposure.

If observation is not successful after four weeks since presentation, then on the basis of a shared decision-making approach, definitive stone treatment should be offered.[18,19]

When a decision has been made to remove a stent, this should be performed within a maximum of two weeks of the decision (LE 4, Gr C)

While stent removal should be undertaken as soon as possible following the decision for removal, logistical factors can prevent this. The time given is the maximum time which the panel considers acceptable to leave a stent

indwelling, once the decision has been made to remove it, given the effects which stents have on patient quality of life and the risks of encrustation.[13]

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Conflicting interests

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Not applicable.

Guarantor

OW.

Contributorship

RDS, KOF and OJW conceived the plan to write these guidelines. The manuscript was written by RDS, KOF, IP, AT and OJW.

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