The results of ureteral stenting after ureteroscopic lithotripsy for ureteral calculi: a systematic review and meta-analysis

CRD summary
The authors concluded that ureteral stenting may not be required after ureteroscopic lithotripsy. Lack of detail provided on study characteristics and quality assessment along with unexplored heterogeneity suggest the authors conclusions should be interpreted with caution.

Authors' objectives
To examine the effectiveness of ureteral stenting after ureteroscopic lithotripsy for ureteral calculi.

Searching
PubMed, EMBASE and The Cochrane Library were searched up to January 2011; search terms were reported. References lists from articles were searched. No language restrictions were applied.

Study selection
Eligible studies were randomised controlled trials (RCTs) of adults with ureteroscopic lithotripsy for impacted ureteral calculi who had received ureteral stenting (with or without a double J stent) compared with a non-stenting group. Included outcomes were mean operative time, lower urinary tract symptoms, fever, urinary tract infection, pain, need for analgesia, unplanned readmission or rehospitalisation and postoperative complication. Studies were excluded if they were of patients with radiolucent stones that made follow-up difficult, had a solitary functioning kidney, previous failure of ureteroscopy treatment of the same stone, preoperative ureteral stenting, a history of sepsis, renal failure, pregnancy, suspicion of urothelial cancer, concomitant ureteral obstruction secondary to other causes (such as stricture) and failed ureteroscopic access to the stone.

Limited data were provided concerning the characteristics of the included studies; the characteristics and included outcomes were similar.

Two reviewers independently conducted study selection.

Assessment of study quality
Quality assessment was based on randomisation, allocation concealment, description of withdrawals and drop-outs and intention-to-treat analyses. Blinding was not assessed as it was not considered relevant to trials of surgical interventions.

The authors did not state how many reviewers assessed quality.

Data extraction
Included outcomes were extracted from each study to calculate either risk ratios (RR) or mean differences (MD) and 95% confidence intervals (CIs).

Data extraction was conducted by two reviewers independently. Any disagreements resolved through discussion or consultation with another author.

Methods of synthesis
Studies were pooled either using fixed-effect or random-effects meta-analysis depending on the extent of heterogeneity. $I^2$ and $X^2$ statistics were used to assess heterogeneity and a random-effects model was used if heterogeneity was found to be statistically significant ($p<0.05$).

Sensitivity analyses were conducted when low quality trials were included in the analysis.

Results of the review
Sixteen trials (1,573 participants) were included in the review.
Mean operative time was 3.44 minutes less for the non-stenting compared with the stenting group (MD -3.44, 95% CI -6.00 to -0.87; 10 studies; $I^2=77\%$).

Risk of lower urinary tract symptoms was statistically significantly lower for non-stenting groups compared with the stenting groups for dysuria (RR 0.45, 95% CI 0.28 to 0.72; seven studies; $I^2=72\%$), urinary frequency or urgency (RR 0.61, 95% CI 0.50 to 0.74; six studies; $I^2=8\%$) and haematuria (RR 0.54, 95% CI 0.33 to 0.87; nine studies; $I^2=69\%$).

There was also a statistically significant benefit of non-stenting compared with stenting for pain three days after treatment (MD -0.83, 95% CI -1.47 to -0.20; eight studies; $I^2=88\%$).

No statistically significant differences were found for fever and urinary tract infections, need for analgesia, unplanned readmission or rehospitalisation and late postoperative complications.

**Authors' conclusions**
The authors concluded that ureteral stenting was associated with greater risk of lower urinary tract symptoms and pain. Ureteral stenting may not be necessary after ureteroscopic lithotripsy.

**CRD commentary**
The review question and inclusion criteria were clear. An acceptable range of electronic databases were searched and the authors made efforts to minimise language bias. There was no indication that unpublished material was sought. Appropriate methods were used to minimise bias and error for study selection and data extraction; it was unclear whether this was also the case for quality assessment.

Very limited information was provided on study characteristics for the included studies and very limited information was provided on the results of the quality assessment so it was not possible to judge the risk of bias for each study. There was high heterogeneity in all reported forest plots. Most studies either suggested no difference or a benefit for non-stenting compared with stenting. There was very limited exploration of heterogeneity.

This was a relatively well-conducted review but the lack of detail provided on study characteristics and quality assessment along with unexplored heterogeneity suggest the authors' conclusions should be interpreted with caution.

**Implications of the review for practice and research**
**Practice:** The authors stated that ureteral stenting after uncomplicated ureteroscopic lithotripsy may not be required.

**Research:** The authors stated well-designed multicentre RCTs should be conducted to examine the effectiveness of ureteral stent placement after ureteroscopic lithotripsy.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract
contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on
the reliability of the review and the conclusions drawn.