Electrohydraulic lithotripsy of upper ureteral calculi with semirigid ureteroscope

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Using electrohydraulic lithotripsy (EHL) (small-caliber, 6.9 F, semirigid ureteroscope associated with small, 3 F, electrohydraulic lithotripsy (EHL) probes) complemented by extracorporeal shockwave lithotripsy (SWL) in patients with single ureteral calculi located above the pelvic brim.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with single ureteral calculi located above the pelvic brim.

Setting
Hospital. The economic study was carried out in Taiwan, Republic of China.

Dates to which data relate
The data for the effectiveness analysis related to the intervention were collected from January 1993 to July 1994. The dates related to effectiveness data for the comparator were between 1988 and 1994. The date of resource utilisation was not reported. The price year was not explicitly reported.

Source of effectiveness data
Effectiveness data were derived from a single study and a review of previously published studies.

Link between effectiveness and cost data
The costing was not clearly reported.

Study sample
No power calculations were reported. Forty-three patients (43 calculi), on whom the intervention was performed, were included in the study.

Study design
Case series, carried out in a single centre. The duration of follow up was up to three months after the ureterolithotripsy.
Analysis of effectiveness
The principal (intention to treat or treatment completers only) used in the analysis of the effectiveness was not explicitly specified. The primary health outcome used was success rate and rate and nature of complications. The success rate was defined as a stone-free state or residual fragments less than 2mm after the operation. A plain abdominal radiograph was used in order to obtain estimates of the success rate. The complications were observed by means of excretory urography, ureteroscopy or both, performed between 1 and 3 months for patients with an iatrogenic ureteral perforation and those observed to have a ureteral stricture before the operation.

Effectiveness results
The total success rate for EHL was 98% (84% for the primary success and 14% after complementary SWL). The complication rate was 9% and all complications were minor perforations of the urethra managed by internal stenting. There were no significant ureteral strictures in these patients or the three patients with an observed apparent stricture below the calculi before the manipulation, during follow up.

Clinical conclusions
Using semirigid ureteroscopy associated with electrohydraulic lithotripsy (EHL) is a safe, convenient, and effective device in the treatment of upper ureteral calculi.

Outcomes assessed in the review
The success rate was the main outcome assessed in the review.

Study designs and other criteria for inclusion in the review
Not reported.

Sources searched to identify primary studies
Not reported.

Criteria used to ensure the validity of primary studies
Not reported.

Methods used to judge relevance and validity, and for extracting data
Not reported.

Number of primary studies included
Five studies were used as the references in the extraction of effectiveness results related to the comparator (SWL).

Methods of combining primary studies
Not reported.

Investigation of differences between primary studies
Not reported.

Results of the review
The success rate attributed to in situ SWL with Dornier HM3 machines was between 72 to 98%. The corresponding
The single session SWL treatment had a success rate between 54 to 86% regardless of the type of machine used.

Measure of benefits used in the economic analysis
The measure of benefits used was the rate of success measured by means of a plain abdominal radiograph (KUB). Success meant a stone-free state or fragments less than 2 mm. The measure of benefits for the comparator was obtained from the literature.

Direct costs
No details of cost estimation were reported other than the "purchasing price" of ureteroscopy associated with EHL.

Indirect Costs
Not performed.

Currency
Not reported.

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
The total success rate was 98% (84% for the primary success and 14% after complementary SWL) for the intervention. The success rate attributed to in situ SWL with Dornier HM3 machines was between 72 to 98%. The corresponding figure for in situ SWL with newer, less powerful lithotripters was between 75 to 90%. The single session SWL treatment had a success rate between 54 to 86% regardless of the type of machine used.

Cost results
The authors reported that "the total medical expenses of ureteroscopy associated with EHL are approximately two thirds of the costs of a single session of SWL treatment" in the study site.

Synthesis of costs and benefits
The costs and benefits were not combined since the intervention was regarded to be the optimal strategy.

Authors' conclusions
Semirigid ureteroscopy associated with EHL is safe, and a cost-effective option for treating upper ureteral calculi, "especially when SWL is not readily available".

CRD COMMENTARY - Selection of comparators
The comparator chosen was ureteroscopy linked to shockwave lithotripsy (SWL). No specific justification was given for the choice of the comparator and you should, therefore, consider whether this a widely used health technology in your own setting.

Validity of estimate of measure of benefit
The internal validity of the estimate of benefit is likely to be weakened as the results corresponding to the intervention
were obtained from a non-random study and those corresponding to the comparator were obtained from a literature review (for which few details were given).

**Validity of estimate of costs**
The information provided in the cost analysis was minimal and no monetary cost figures were given.

**Other issues**
Given the lack of randomisation, sensitivity analysis, and statistical analysis, the results need to be treated with some cautions. The authors made clear that the study results, in terms of their cost context, are restricted to Taiwan, and that they could apply only to developing countries in any case. Some comparisons were made with results previously published.

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