

INPLASY PROTOCOL

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None declared.

Safety and efficacy of extracorporeal shock wave lithotripsy versus flexible ureteroscopy in the treatment of urinary calculi: a systematic review and meta-analysis

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Review question / Objective: To compare the safety and efficacy of extracorporeal shock wave lithotripsy (ESWL) and flexible ureteroscopy lithotripsy (f-URS) in the treatment of urinary tract stones.

Eligibility criteria: (1) Studies comparing ESWL and F-URS in the treatment of patients with calculi; (2) Reported outcomes we were interested in, such as SFR, operation time, complication rate, hospital stay, auxiliary procedure rate and retreatment rate and so on; (3) Stone was less than 2cm in the diameter; (4) Age of patients were over 18.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 19 April 2022 and was last updated on 19 April 2022 (registration number INPLASY202240120).

INTRODUCTION

Review question / Objective: To compare the safety and efficacy of extracorporeal shock wave lithotripsy (ESWL) and flexible ureteroscopy lithotripsy (f-URS) in the treatment of urinary tract stones.

Condition being studied: To compare the safety and efficacy of extracorporeal shock wave lithotripsy (ESWL) and flexible

ureteroscopy lithotripsy (f-URS) in the treatment of urinary tract stones.

METHODS

Search strategy: Search strategy design included studies comparing ESWL and F-URS in the treatment of renal stone <2cm or upper ureteral stone <2cm. The key words used for search were "Ureteroscopy" "Lithotripsy" "Extracorporeal Shockwave Lithotripsy"

“Calculi” “Stone”. The Detailed search strategies can be found in Supplementary Materials. In addition, we manually searched the reference list of excluded publications to identify any further potential studies.

Participant or population: (1) Studies comparing ESWL and F-URS in the treatment of patients with calculi; (2) Reported outcomes we were interested in, such as SFR, operation time, complication rate, hospital stay, auxiliary procedure rate and retreatment rate and so on; (3) Stone was less than 2cm in the diameter; (4) Age of patients were over 18.

Intervention: Flexible ureteroscopy.

Comparator: extracorporeal shock wave lithotripsy.

Study designs to be included: (1) Studies comparing ESWL and F-URS in the treatment of patients with calculi; (2) Reported outcomes we were interested in, such as SFR, operation time, complication rate, hospital stay, auxiliary procedure rate and retreatment rate and so on; (3) Stone was less than 2cm in the diameter; (4) Age of patients were over 18.

Eligibility criteria: (1) Studies comparing ESWL and F-URS in the treatment of patients with calculi; (2) Reported outcomes we were interested in, such as SFR, operation time, complication rate, hospital stay, auxiliary procedure rate and retreatment rate and so on; (3) Stone was less than 2cm in the diameter; (4) Age of patients were over 18.

Information sources: All relevant literatures on PubMed, Embase, Cochrane library database were reviewed.

Main outcome(s): The main outcomes are SFR and complication rate. The secondary results are operation time hospital stay, number of sessions, auxiliary procedure rate and retreatment rate.

Quality assessment / Risk of bias analysis: We used the Cochrane collaboration's tool

(version 5.3, The Nordic Cochrane Centre, The Cochrane Collaboration, USA) to evaluate the methodological quality of each randomized controlled trial (RCT). Deviation risk was identified from seven aspects using this tool. We used the Newcastle-Ottawa Quality Assessment Scale (NOS) to evaluate the methodological quality of each included cohort studies. Studies with a score ≥ 6 was eligible for our meta-analysis.

Strategy of data synthesis: We used odds ratio (OR) and 95 % confidence interval (95 % CI) to summarize the dichotomous variables, and we used mean difference (MD) and 95 % CI to summarize continuous variables which were presented as mean values with standard deviations (SDs). For studies presenting continuous variables as means and range, we did not incorporate their data in the meta-analysis.

Subgroup analysis: To compare the efficacy of ESWL and F-URS for stone <1 cm and stone for 1-2 cm, respectively, we performed meta-analyses on these 2 subgroups. If a study only described stones <2 cm, the study would not be included in either of the two subgroups. Besides, to compare the different grades postoperative complications of the two treatments, we performed a meta-analysis on 4 subgroups: grade 1, grade 2, grade 3 and grade 4 complications. The complication grade was determined according to the Clavien-Dindo classification.

Sensitivity analysis: We conducted sensitivity analysis by omitting studies one by one to examine the stability of pooled estimates. If there was no significant difference between the adjusted results and the primary results, our meta-analysis was stable.

Language: English.

Country(ies) involved: China.

Keywords: Extracorporeal shock wave lithotripsy, flexible ureteroscopy, meta analysis, urinary calculi, retrospective study, prospective randomized study.

Contributions of each author:

Author 1 - Guangda Lv - Author 1 drafted the manuscript and material preparation, data collection and analysis.

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Author 2 - Wenqiang Qi - Author 2 drafted the manuscript and material preparation, data collection and analysis.

Author 3 - Yongheng Zhou.

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