

INPLASY PROTOCOL

To cite: Cui et al. Suction sheath versus traditional sheath in percutaneous nephrostomy: a systematic review and meta-analysis of randomized controlled trials. Inplasy protocol 2020110135. doi: 10.37766/inplasy2020.11.0137

Received: 28 November 2020

Published: 29 November 2020

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Support: None.

Review Stage at time of this submission: Piloting of the study selection process.

Conflicts of interest:
None.

Suction sheath versus traditional sheath in percutaneous nephrostomy: a systematic review and meta-analysis of randomized controlled trials

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Review question / Objective: To examine the efficacy and safety of suction sheath in percutaneous nephrostomy.

Condition being studied: Percutaneous nephrolithotomy (PCNL) plays an integral role in managing especially large (>2 cm) renal stones and/or staghorn renal stones, but complications like fever and bleeding can represent a major concern. The conventional nephrostomy sheath serves as a conduit to gain access to the stone during this procedure. It allows repeated passage of the endoscope and its accessories. It also allows passive egress of irrigation fluid and stone fragments. In order to reduce complications we want smaller sheath size, but this brings some limitations such as a more difficult stone fragments retrieval, a smaller visual field, longer operative times (OT) and higher intrarenal pressures. In particular, IRP higher than 30 mmHg has been proven to cause pyelovenous backflow, potentially leading to infectious complications. To overcome these limitations, aspirating sheath have been introduced. The real-time suction of irrigation fluid, stone fragments and blood throughout the procedure may lower IRP, ameliorate visibility and quicken the procedure.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 29 November 2020 and was last updated on 29 November 2020 (registration number INPLASY2020110135).

INTRODUCTION

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METHODS

Participant or population: Patients with kidney calculi undergo percutaneous nephrolithotomy using either a conventional sheath or a suction sheath. Patients with anomalous kidneys or a history of open interventions in the ipsilateral kidney were excluded.

Intervention: In any setting, used suction sheath in PCNL with kidney calculi patient will be eligible.

Comparator: In any setting, used traditional sheath in PCNL with kidney calculi patient will be eligible.

Study designs to be included: All randomized controlled trials (RCTs).

Information sources: A systematic review of the literature was performed in Nove 2020 using MEDLINE, EMBASE, Web of knowledge, Google Scholar and the Cochrane Central Search Library. The following Medical Subject Heading (MeSH) terms and key words were used to identify relevant studies: percutaneous nephrolithotomy AND (suction OR aspirator OR suctioning system OR vacuum).

Additional studies were identified by manual search from the references of original studies or review articles on this topic. Full texts or abstracts of all related reports were then reviewed.

Main outcome(s): Stone-free rate.

Additional outcome(s): incidence of postoperative fever, incidence of needing 2nd state surgery, incidence of needing transfusion, number of working tract, operation time, postoperative hospitalization time.

Quality assessment / Risk of bias analysis: The quality of evidence in the included studies was evaluated using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system.

Strategy of data synthesis: A meta-analysis was performed to assess To examine the efficacy and safety of suction sheath in percutaneous nephrostomy. Continuous outcomes were analyzed using inverse variance method, and observed treatment effect was International prospective register of systematic reviews reported as mean difference (MD) with 95% confidence intervals (CIs). Categorical outcomes were analyzed using Mantel-Haenszel method, and observed effect size was reported as risk ratios (RRs) with 95% CI. The random-effects model was used when there was heterogeneity (P 0.1) of the results of the trials. Otherwise, the fixed-effects model was used. Subgroup analysis was carried out to evaluate the Stone-free rate of used suction sheath in percutaneous nephrostomy. Publication bias was evaluated by Egger's and Begg's test, with the statistical significance level set at 0.05.

Subgroup analysis: Stone location; Stone size; Comorbidities; Stone hardness; Positive urine culture; Degree of hydronephrosis; Stone number; Stone composition; sheath size.

Sensibility analysis: Changing inclusion criteria, excluding low-quality studies, and

using different statistical methods/models
to analyze the same data.

Country(ies) involved: China.

Keywords: suctioning system; PCNL.

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