

INPLASY PROTOCOL

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None declared.

Comparison of Different Surgical Techniques for Chronic Subdural Hematoma: A Network Meta-Analysis

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Review question / Objective: (1) participants: Patients aged 18 years or older with a CSDH requiring surgical treatments and without contra-indication for use of any of the surgical techniques or for general anesthesia were eligible for inclusion; (2) intervention: surgical treatments such as single burr hole craniotomy, double burr hole craniotomy, craniotomy, mini-craniotomy and twist drill craniotomy; (3) Comparison: another one procedures which listed above; (4) outcomes: Postoperative outcome such as: recurrence, reoperation, complication, mortality, favorable outcome and time indicators such as: the length of hospital stay, operation time; (5) study type: randomized controlled trials, retrospective studies and cohort studies.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 26 February 2023 and was last updated on 26 February 2023 (registration number INPLASY202320114).

INTRODUCTION

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Condition being studied: The primary objective of this investigation is to conduct a comparative analysis of surgical techniques employed in the management of chronic subdural hematoma. Given that surgical intervention is typically the primary treatment modality for symptomatic or giant chronic subdural hematoma, the selection of an appropriate surgical technique is of paramount importance in achieving optimal patient outcomes. This study involved a meticulous review of the literature concerning five distinct surgical procedures by searching from Embase, PubMed, the Cochrane Library. By comparing these trials, this study aims to provide valuable insights into the effectiveness of different surgical techniques in the management of chronic subdural hematoma.

METHODS

Participant or population: Patients aged 18 years or older who have been diagnosed with chronic subdural hematoma (CSDH).

Intervention: Surgical treatments such as single burr hole craniotomy, double burr hole craniotomy, craniotomy, mini-craniotomy and twist drill craniotomy

Comparator: The mutual comparison among the five surgical techniques.

Study designs to be included: Randomized controlled trials, retrospective studies and cohort studies.

Eligibility criteria: (1) participants: individuals under the age of 18, those diagnosed with neurodegenerative

disorders, individuals with medical or psychiatric disorders, and those with other intracranial diseases such as intracranial space-occupying lesions; (2) study type: studies that will be excluded from this investigation include conference abstracts, comments, reviews, and protocols; (3) studies that do not have full-text versions or available data will also be excluded from this study.

Information sources: A systematic search of electronic databases, including PubMed, Embase, and the Cochrane Library was conducted up until February 2023 to ensure the most up-to-date and comprehensive literature was included in the review.

Main outcome(s): The postoperative outcomes of interest in this study include recurrence, reoperation, complications, mortality, and favorable outcomes. In addition, time-related indicators such as the length of hospital stay and operation time will also be assessed.

Quality assessment / Risk of bias analysis: Two independent reviewers who were not involved in data extraction evaluated the quality of included studies using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) scale. The evaluation included five domains: risk of bias, inconsistency, indirectness, imprecision, and publication bias. This approach enhances the credibility and reliability of study findings.

Strategy of data synthesis: We assessed the appropriateness of the transitivity assumption before conducting network meta-analysis (NMA) and performed pairwise meta-analysis using Review Manager 5.4. Odds ratio (OR) and standard difference (SD) were used to present dichotomous and continuous outcomes, respectively, with 95% confidence intervals (CI). We applied NMA with random-effects models to compare all surgical techniques using STATA 17.0, which generated a network graph. We used surface under the curve ranking area (SUCRA) to rank the performance of different surgical drainage treatments in each efficacy and safety

outcome. Two-tailed tests were performed with $P < 0.05$ considered statistically significant. Publication bias was evaluated using a funnel plot.

Subgroup analysis: There was no subgroup analysis in our study.

Sensitivity analysis: The chi-square Q test and I² statistic were used to evaluate heterogeneity. Consistency between direct and indirect evidence was assessed using node split approach and $P < 0.05$ was considered inconsistency. We used I² values to detect heterogeneity, with above 75% indicating high heterogeneity.

Country(ies) involved: China.

Keywords: Chronic subdural hematoma, CSDH, Burr hole craniostomy, Twist drill craniostomy, Mini-craniotomy.

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