

INPLASY PROTOCOL

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None declared.

Anterior versus posterior steroid injection approach for adhesive capsulitis

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Review question / Objective: Which steroid injection approach is more effective, anterior or posterior, for adhesive capsulitis? The purpose of this review will be to compare the efficacy of anterior versus posterior steroid injection approach in adhesive capsulitis.

Condition being studied: Adhesive capsulitis, or frozen shoulder, is a painful restriction of the glenohumeral joint, thought to be caused by inflammation of the synovial lining capsule and contracture of the glenohumeral joint. It is characterized by progressive shoulder pain with gradual loss of both passive and active range of motion. It is one of the most common musculoskeletal disorders treated by orthopedic surgeons with a prevalence of 25% in the general population, and risk factors include trauma, diabetes, stroke, and prolonged immobilization.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 26 January 2023 and was last updated on 26 January 2023 (registration number INPLASY202310080).

INTRODUCTION

Review question / Objective: Which steroid injection approach is more effective, anterior or posterior, for adhesive capsulitis? The purpose of this review will be to compare the efficacy of anterior versus posterior steroid injection approach in adhesive capsulitis.

Rationale: Intraarticular steroid injection has been shown to be one of the most effective treatment for adhesive capsulitis since it may reduce synovial inflammation, resulting in reduction of pain and disability. While the posterior approach has been more commonly used, there have been thoughts that the anterior approach targeting rotator interval might yield better

outcomes since fibrosis, fibroid degeneration, collagen deposition, and hyalinization are observed in the rotator interval and in the coracohumeral ligament. Recent studies have compared the efficacy between the anterior and posterior steroid injection approaches, and therefore conducting a systematic review with meta-analysis may aid clinicians in making evidence-based decisions.

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METHODS

Search strategy: PubMed, Embase, and Web of Science will be searched. Search strategy for PubMed will be
#1 adhesive capsulitis OR frozen shoulder
#2 anterior approach OR rotator interval OR posterior approach OR steroid injection
#3 #1 AND #2.

Participant or population: Patients with a clinical diagnosis of adhesive capsulitis or frozen shoulder who demonstrated shoulder pain and limitations of active and passive range of motion in at least 2 directions

Intervention: Steroid injection through either anterior or posterior approach

Comparator: The posterior approach will be compared with the anterior approach (rotator interval).

Study designs to be included: Randomized controlled trials and prospective comparative studies.

Eligibility criteria: We will include randomized controlled trials and prospective comparative studies that compared anterior and posterior steroid injection approaches for adhesive capsulitis. Adult patients with clinical diagnosis of adhesive capsulitis would be eligible for inclusion.

Information sources: We will search PubMed, Embase, and Web of Science. We will look for ongoing trials at ClinicalTrials.gov. We will also review the reference lists of the relevant review articles.

Main outcome(s): The primary outcome will be pain visual analog scale and range of motion at 12 weeks.

Additional outcome(s): Incidence of adverse events associated with each approach. Depending on the availability of outcomes, shoulder pain and disability index, patient satisfaction, American Shoulder and Elbow scores, Constant score, and DASH score will be considered as secondary outcomes. Also, the primary outcomes and secondary outcomes at different follow-up periods (4-, 6-, 8-weeks, or after 12 weeks) will be considered.

Data management: The data including demographic information of patients (age, gender, BMI, symptom duration, comorbidity, etc), number of patients, the dose of steroid and total volume of injection, adverse events, the use of ultrasound-guidance, physical therapy protocol, outcome measures will be extracted by two authors and collected in the google spreadsheet.

Quality assessment / Risk of bias analysis: The risk of bias will be independently assessed by two authors using the Cochrane risk of bias tool for randomized controlled trials. The assessment using the Cochrane risk of bias tool includes: 1) random sequence generation; 2) allocation concealment; 3) blinding of participants and personnel; 4) blinding of outcome assessment; 5) incomplete outcome data; 6) selective reporting; and 7) other bias.

Each component will be judged to be low or high risk of bias or marked unclear if the information provided by the article was insufficient to make a judgment. Any discrepancy encountered during this process was resolved by reaching a consensus. For prospective cohort studies, the Newcastle-Ottawa Scale will be used to assess the risk of bias by two authors as well.

Strategy of data synthesis: We will perform a random-effects pairwise meta-analysis due to potential variability across the studies. Cochran Q and I^2 statistics will be calculated to assess heterogeneity among articles. If there are more than 10 articles, publication bias will be assessed using Begg's rank correlation test and Egger's regression asymmetry test. Depending on the outcomes, we will conduct the analyses with either weighted mean difference or standardized mean difference (SMD) with 95% confidence interval.

Subgroup analysis: Depending on the number of available studies, we will conduct the following subgroup analyses:

1. the studies that used ultrasound guidance
2. the studies that did not use ultrasound guidance
3. the studies that performed hydrodilation
4. the studies that did not perform hydrodilation.

Sensitivity analysis: If both randomized controlled trials and prospective comparative studies are included for meta-analysis to derive overall result, sensitivity analysis will be performed including only the randomized controlled trials.

Language restriction: English or other languages that could be translated into English.

Country(ies) involved: United States.

Keywords: rotator interval approach; adhesive capsulitis; frozen shoulder.

Dissemination plans: We plan to disseminate through conference

presentation as well as publication in peer-reviewed journals.

Contributions of each author:

Author 1 - Hye Chang Rhim - Author 1 will participate in search, data extraction, statistical analysis, and manuscript writing. Email: hrhim@mgh.harvard.edu

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