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Chang, KV¹.**ADMINISTRATIVE INFORMATION****Support** - TSUM.**Review Stage at time of this submission** - Preliminary searches.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202370022**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 07 July 2023 and was last updated on 07 July 2023.**INTRODUCTION**

Review question / Objective To summarize peri-operative sonoelastography data on repaired rotator cuffs.

Rationale Rotator cuff tears are a prominent contributor to shoulder pain and disability. Surgical intervention becomes necessary when symptoms persist despite conservative treatment. However, it is concerning that a significant percentage of patients (ranging from 11% to 57%) experience structural failure following repair, which greatly affects post-surgical outcomes. To address this issue, sonoelastography, an ultrasound modality that assesses the elastic properties of tissues, can offer valuable insights. By measuring the mechanical characteristics of the rotator cuff before and after repair, sonoelastography can provide valuable information about the healing process of rotator cuff tendons following surgery.

Condition being studied The systematic review utilized the PICO (Population, Intervention, Comparison, Outcome) framework, with the

following parameters: Population (P): Human participants diagnosed with rotator cuff tears Intervention (I): Rotator cuff repair Comparison (C): Assessment of differences in rotator cuff stiffness Outcome (O): Evaluation of changes in rotator cuff stiffness post-repair and comparison between healed and return tendons.

METHODS

Search strategy Two authors will make independent searches in PubMed, Embase, and Web of Science from inception without language restrictions. The algorithm used is as followed: (“ultrasound” OR “sonography” OR “ultrasonography”) AND (“stroke” OR “post-stroke” OR “hemiplegic”) AND (“shoulder” OR “upper limb” OR “arm”).

Participant or population Human participants with rotator cuff tears.

Intervention Rotator cuff repair.

Comparator Differences in rotator cuff stiffness.

Study designs to be included Clinical studies.

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Eligibility criteria Studies that (1) were clinical trials studying the pre-repair or post-repair rotator cuff with sonoelastography and (2) enrolled living human participants are included.

Information sources Electronic databases of PubMed, Embase and Cochrane will be searched. The following search term will be used: (“rotator cuff” OR “subscapularis” OR “supraspinatus” OR “infraspinatus” OR “teres minor”) AND (“repair” OR “surgery” OR “arthroscopy” OR “arthroscopic”) AND (“sonoelastography” OR “elastography” OR “sonography” OR “ultrasound.”).

Main outcome(s) Time-based evolutions of the stiffness of the repaired rotator cuffs.

Additional outcome(s) Nil.

Data management Two independent authors will extract the first author, year of publication, study design, country in which the study was performed, number of patients, mean age, injury and surgery type, measurement site, sonoelastography mode, duration of follow-up and main findings of sonoelastography measurement from each eligible study.

Quality assessment / Risk of bias analysis The methodological appraisal will be carried out using the Newcastle-Ottawa Scale. Three main domains (selection, comparability, outcome) containing seven items will be evaluated to identify possible biases. Two authors will rate the study quality separately and the final score will be decided by consensus.

Strategy of data synthesis Based on the extracted data, we will analyze findings in regard to the changes of stiffness in repaired rotator cuff and will explore the clinical implications of sonoelastography for rotator cuff repair.

Subgroup analysis Nil.

Sensitivity analysis Nil.

Language restriction No limitation of languages.

Country(ies) involved Taiwan.

Keywords Rotator cuff, shoulder, arthroscopic rotator cuff repair, ultrasound, sonoelastography.

Contributions of each author

Author 1 - Ke-Vin Chang.