

Percutaneous Sectioning of the Coracohumeral Ligament for Adhesive Capsulitis

Preliminary Data from a Randomized Controlled Trial

Ria Malhotra, MD, Tahereh Naeimi, MD, Sandeep Yerra, MD

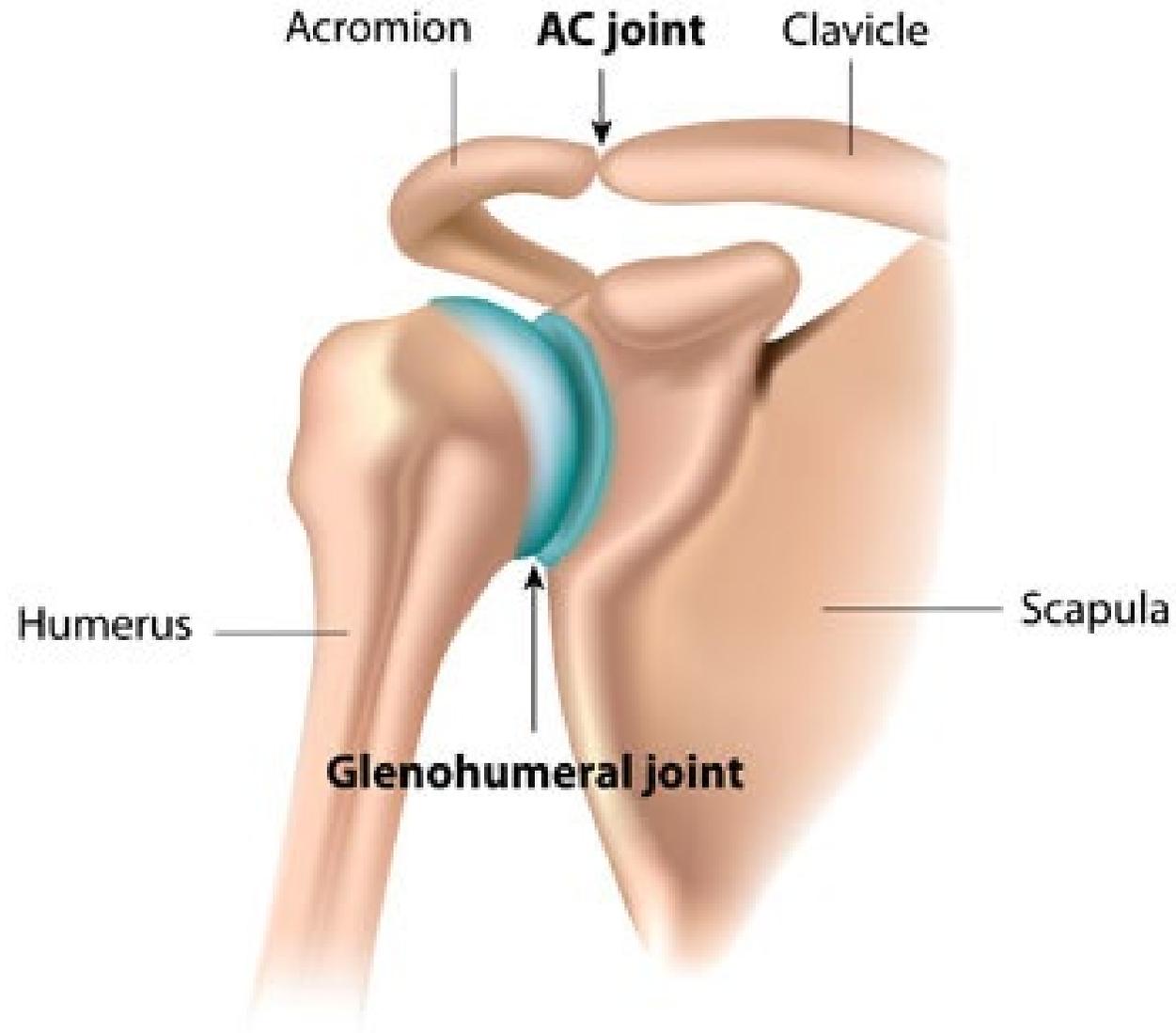
Mentored by Sayed E. Wahezi, MD



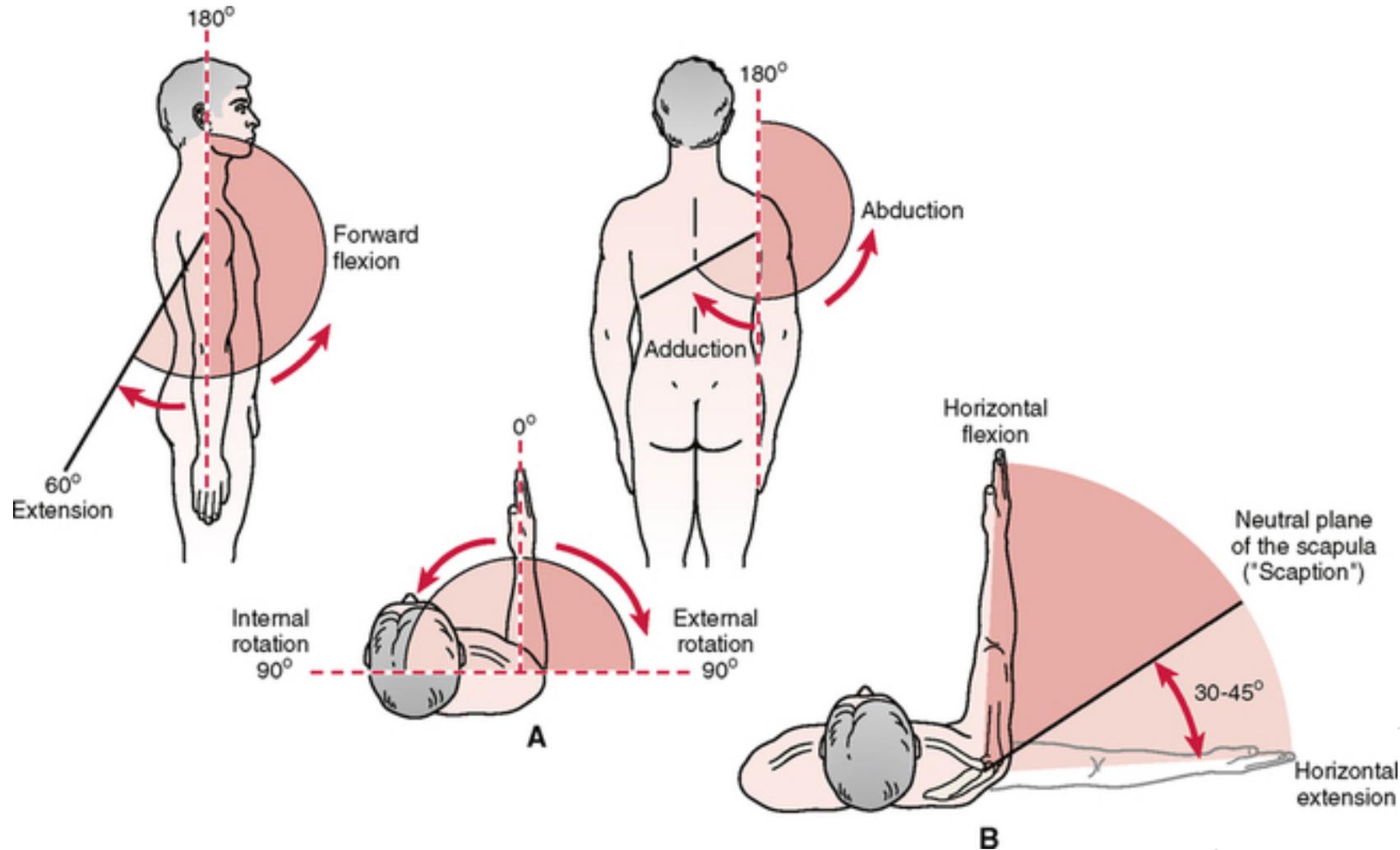
None of the researchers in this study have any financial relationships to disclose.



Shoulder (Glenohumeral) Joint

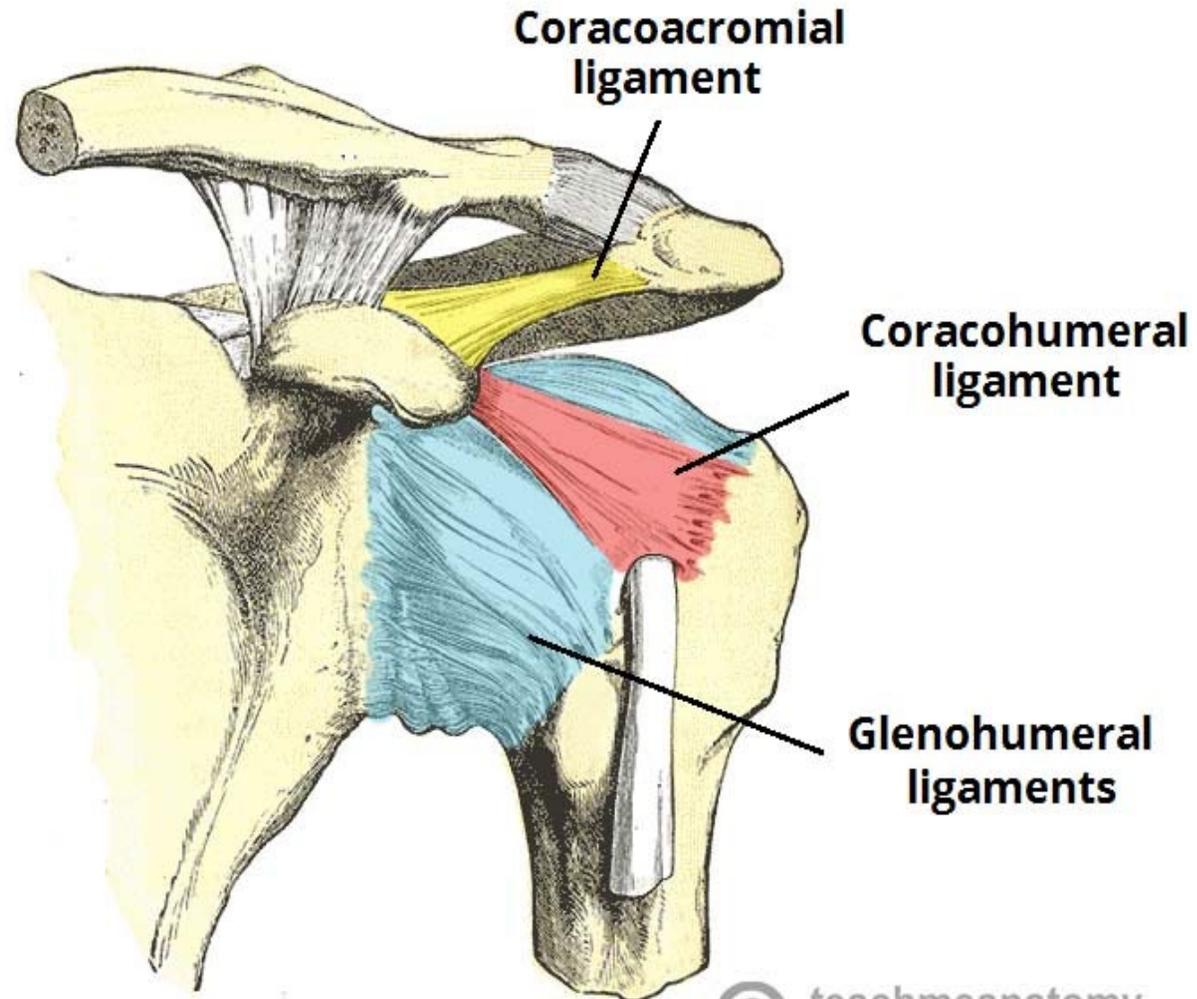


Shoulder Range of Motion





Ligamentous Support





Adhesive Capsulitis

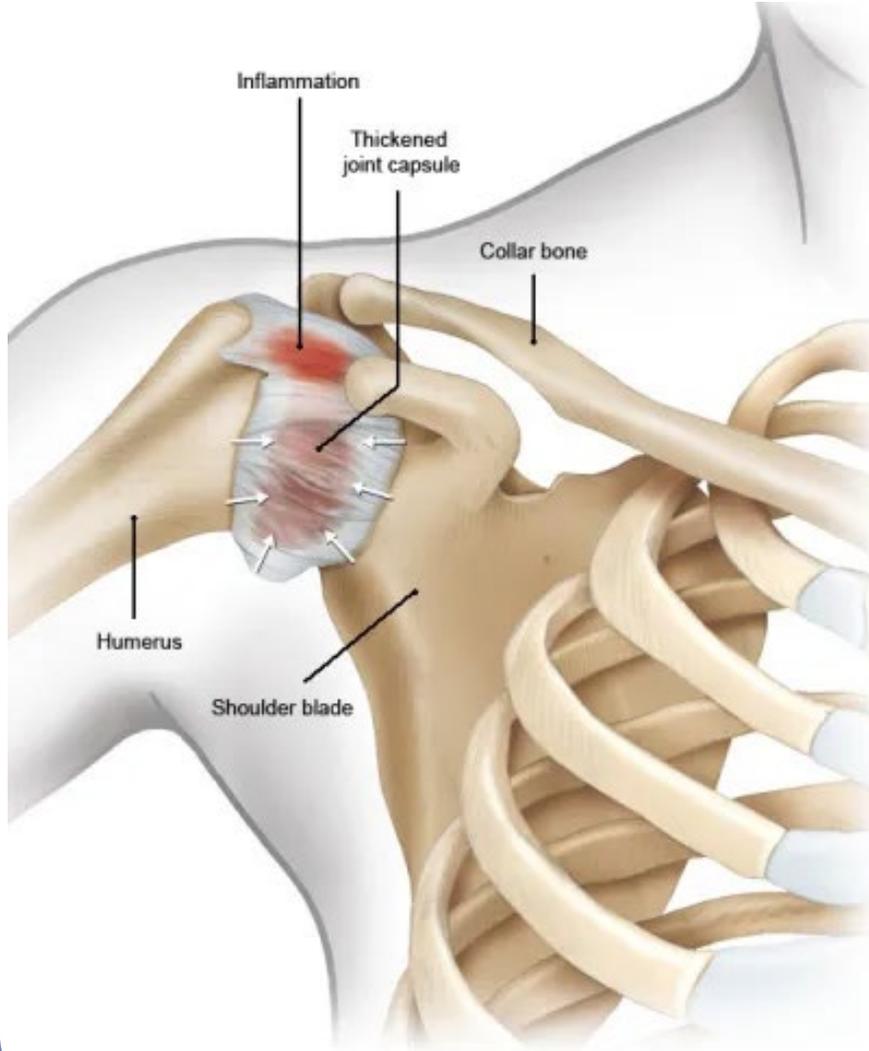
- ▶ Also known as “frozen shoulder”
- ▶ Defined as excessive scar tissue or adhesions across the glenohumeral joint, leading to stiffness, pain and dysfunction
- ▶ Primary
 - ▶ Idiopathic and can occur in the absence of trauma or inciting event
- ▶ Secondary
 - ▶ Chronic illness, articular trauma such as dislocations or surgery, and immobilization



Adhesive Capsulitis

- ▶ Affects 2-3% of the population but incidence can be as high as 20% in patients with diabetes
- ▶ Occurs in three stages
 - ▶ Painful
 - ▶ Adhesive stage
 - ▶ Recovery stage

Pathophysiology



- ▶ Underlying mechanism is not well defined
 - ▶ Capsular fibrosis and inflammation within the synovium
 - ▶ Fibroblast proliferation and thickening of the coracohumeral ligament (CHL)
 - ▶ MRI and ultrasonographic studies have consistently shown thickening of the CHL



Management of Adhesive Capsulitis

NSAIDs & PT

CSI

Hydrodilatation

Manipulation
Under
Anesthesia

Shoulder
Arthroscopy



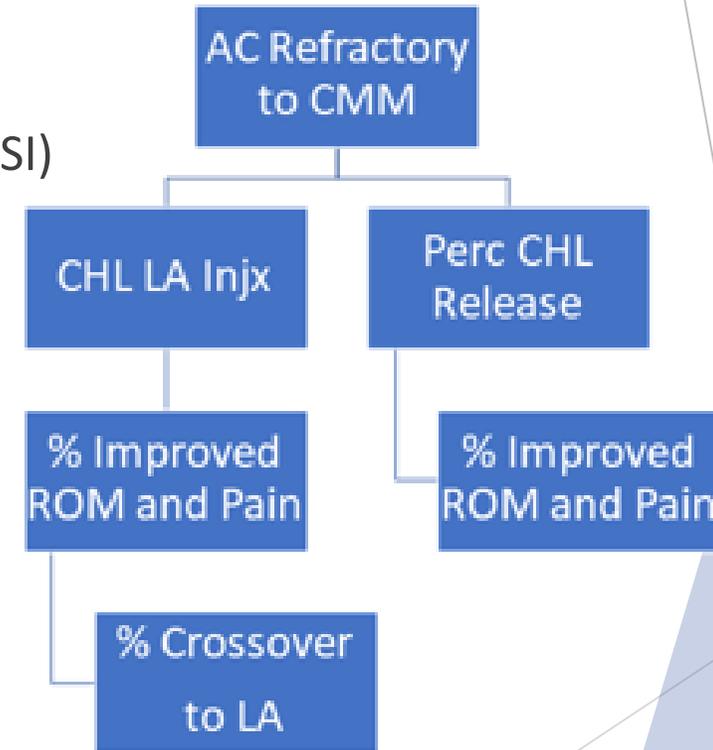
Percutaneous Sectioning of CHL

- ▶ Examines coracohumeral ligament as the target of treatment given current understanding of pathophysiology
- ▶ Offers non-invasive management of refractory or severe adhesive capsulitis
- ▶ Technique that has been useful for other conditions causing inflammatory changes and thickening of connective tissues
 - ▶ Achilles tendinopathy
 - ▶ Lateral epicondylitis
 - ▶ Greater Trochanteric Pain Syndrome
- ▶ Proof of concept achieved in cadaveric study



Study Design

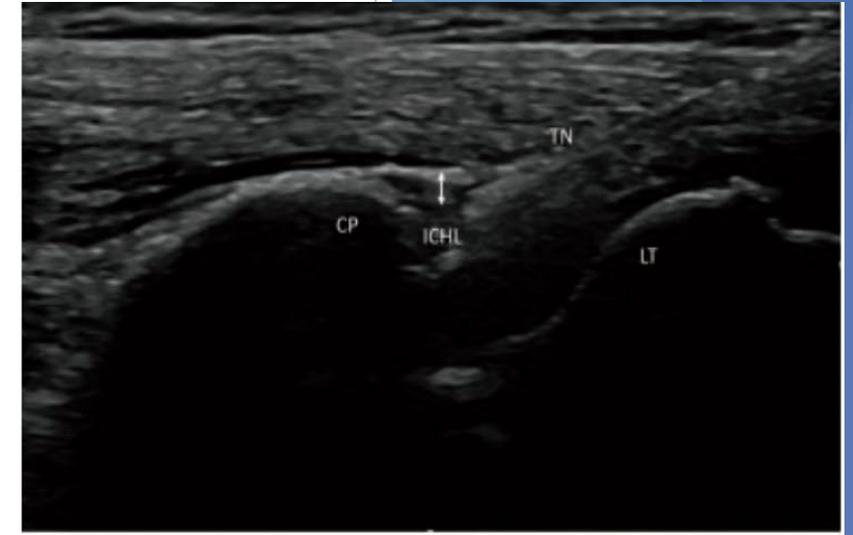
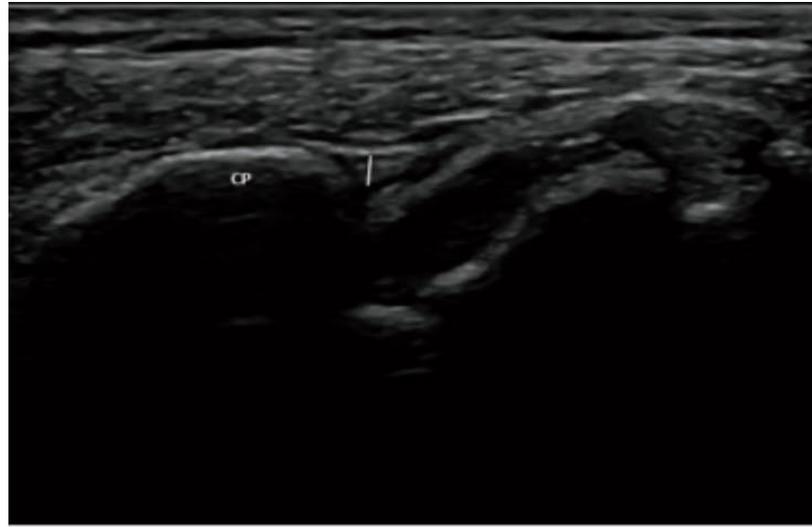
- ▶ Patient selection
 - ▶ Adults aged 18-89 years with diagnosis of adhesive capsulitis, identified by an orthopedic surgeon (non-surgical candidates)
- ▶ Inclusion Criteria
 - ▶ Failed conservative management (PT, NSAIDs, and CSI)
 - ▶ CHL thickness greater than 3mm on ultrasound
- ▶ Exclusion Criteria
 - ▶ Improved shoulder ROM with conservative mgmt
 - ▶ Current pregnancy
- ▶ Outcome Measures
 - ▶ Primary
 - ▶ ROM (external rotation and abduction) and NRS
 - ▶ Secondary
 - ▶ OSS to determine pain and functional outcomes





Intervention

- ▶ Complete sectioning achieved in 7 minutes with approximately 250 passes of the device
- ▶ Saline solution then used for irrigation and debridement





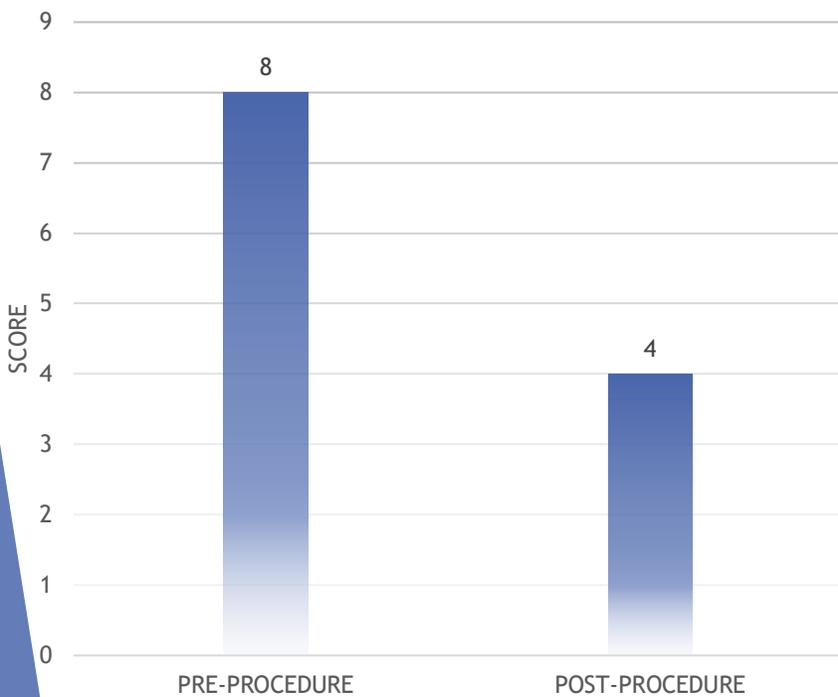
Results

- ▶ Total of 47 patients recruited (39 females and 9 males) with mean age of 62.8 years and BMI of 32.57
 - ▶ No significant demographic difference between groups
- ▶ 30 patients randomized to percutaneous sectioning and 17 to local anesthetic (13 crossed over to active group at 1 month)
- ▶ Patients in both groups had significant improvements in NRS, external rotation, and abduction post-procedure
- ▶ Tolerated well with no complications

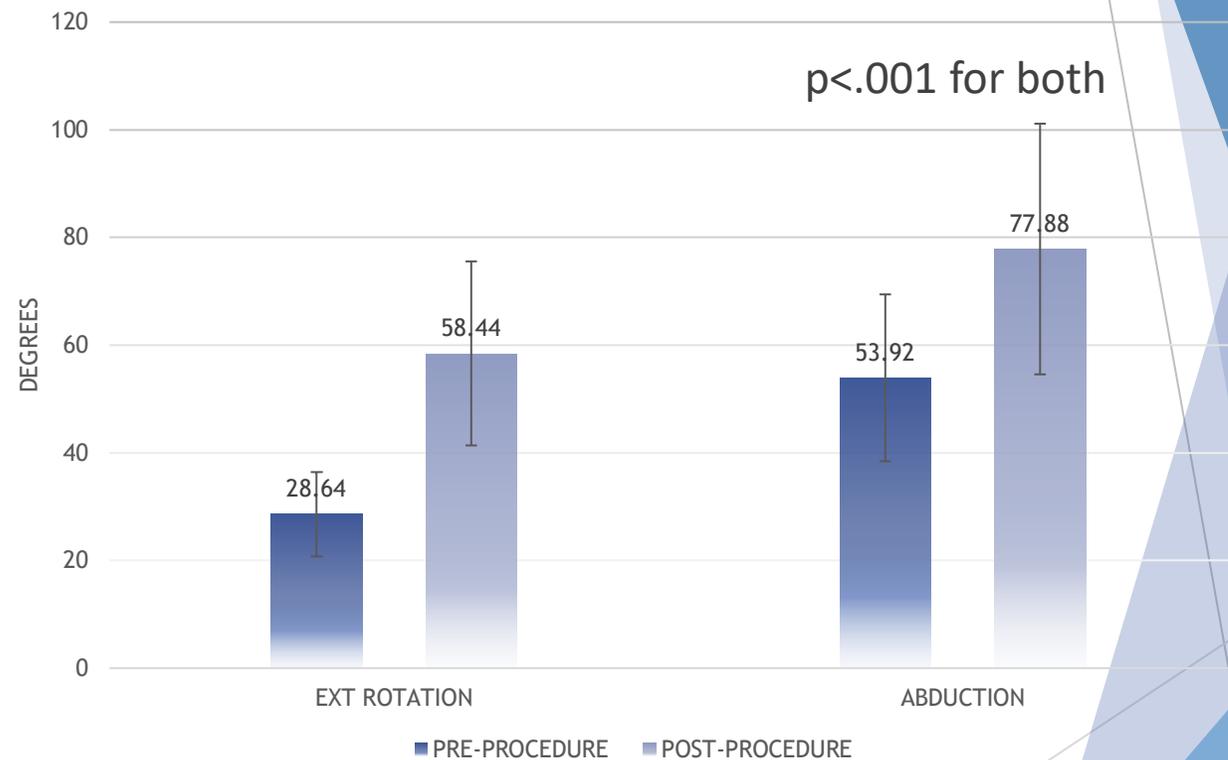


Preliminary Analysis

NRS



RANGE OF MOTION



Discussion

- ▶ Significant improvements in both shoulder external rotation and abduction noted post-procedure at one year
- ▶ Sustained relief of pain long-term
- ▶ Procedure well-tolerated

- ▶ Limitations
 - ▶ Complete long-term data to follow
 - ▶ Further studies for replication

Conclusion

- ▶ We believe that ultrasound guided CHL ligament interruption may be an effective and safe procedure for the treatment of chronic adhesive capsulitis and severe ROM deficits
- ▶ Offers minimally-invasive treatment option to refractory cases and poor surgical candidates

References

- ▶ Mengiardi B, Pfirrmann CWA, Gerber C, Hodler J, Zanetti M. Frozen shoulder: MR arthrographic findings. *Radiology* 2004;233(2):486–92.
- ▶ Tandon A, Dewan S, Bhatt S, Jain AK, Kumari R. Sonography in diagnosis of adhesive capsulitis of the shoulder: A case-control study. *J Ultrasound* 2017;20 (3):227–36.
- ▶ Yang C-Y, Fu L-H, Lee C-C, Wang KA, Chou C-L, Wang J-C. Short-term outcome predictors in patients with primary adhesive capsulitis treated with ultrasound-guided hydrodilatation and corticosteroids. *Am J Phys Med Rehabil* 2020;1.
- ▶ Sassoon AA, Adigweme OO, Langford J, Koval KJ, Haidukewych GJ. Manipulation under anesthesia: A safe and effective treatment for posttraumatic arthrofibrosis of the knee. *J Orthop Trauma* 2015;29 (12):e464–e648
- ▶ Wahezi S, Yerra S, Rivelis Y, Sitapara K, Gonzalez D, Downie S, Jain R, Deer T, Abd-Elsayed A, Gulati A. Sonographically Guided Percutaneous Sectioning of the Coracohumeral Ligament for the Treatment of Refractory Adhesive Capsulitis: Proof of Concept. *Pain Med.* 2020 Dec 25;21(12):3314-3319. doi: 10.1093/pm/pnaa262. PMID: 32869096.
- ▶ Yerra S, Gulati A, Wahezi S. Letter to the Editor: "Technique with Validation of Sonographically Guided Percutaneous Interruption of the Coracohumeral Ligament for Adhesive Capsulitis". *Pain Med.* 2020 Dec 25;21(12):3718-3720. doi: 10.1093/pm/pnaa340. PMID: 33180936.

