

Idiopathic Frozen Shoulder

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Idiopathic frozen shoulder is a primary shoulder condition presenting with pain and restricted range of motion. Since arthroscopy can reveal unsuspected pathology.

Natural History

Traditional teaching claims that the frozen shoulder runs a self-limiting natural course of about two years.¹²³⁴ Other studies present a less optimistic outlook.⁵⁶⁷⁸

Three clinical phases

There are classically three clinical phases of frozen shoulder.⁹ The length of the painful(freezing), stiffening(frozen), and thawing stage is variable.

	Phase	Time	Symptoms
I	Painful	2-9 mo	Insidious onset of pain with progressive loss of motion.
II	Stiffening	4-12 mo	Pain with progressive loss of motion. Muscle atrophy.
III	Thawing	6-9 mo	Pain subsides. Motion gradually returns over 1-3 years.

Gross Pathology

1. Ozaki¹⁰ said that contracture of the coracohumeral ligament and rotator interval was the main cause of the restricted glenohumeral movement. Resection of these tissues relieved pain and restored motion.
2. Nobuhara¹¹ states that frozen shoulder begins with subacromial bursitis disrupting the normal external rotation of the greater tuberosity as it clears the acromion in the 90-120° arc. Next, contracture of the coracohumeral ligament limits external rotation. Surgical procedures consisted of resection of the coracohumeral ligament, coracoacromial ligament, and the anterior acromion.
3. Kieras and Matson treated 12 refractory frozen shoulders, including 7 diabetics, by open lysis of subdeltoid adhesions,

release of the coracohumeral ligament, subscapularis lengthening, and anteroinferior capsular release¹² Pain decreased and all patients returned to work. Average forward flexion improved from 73° to 132°, and average external rotation improved from 5° to 45°.

4. Hazlemann felt that previous studies reported advanced pathology and missed the mild non-specific synovitis observed by arthroscopy during the first 12 weeks of disease.¹³ He also noted thickening of the subacromial bursa with the surrounding soft tissues friable and hypervascular. Shoulder capsular tissue from a patient with frozen shoulder showed fibroblast and myoblast proliferation identical to that seen in Dupuytren's disease; vascular changes suggested diabetic microangiopathy.¹⁴ Hazlemann suggested that future studies in frozen shoulder may show abnormalities at a cellular level, with malfunction in fibroblast recruitment and cytokine growth factor production and release.

Arthroscopic Pathology in the Frozen Shoulder¹⁵

These findings have been described by Haeri¹⁶, Detrisac and Johnson¹⁷, Uitvlugt and Johnson¹⁸, Nevaizer¹⁹, Wiley²⁰, Poehling²¹, and Esch.

Structure	Findings	Treatment
Anterior triangle	Diffuse synovitis, scar, & contracture of CH ligament.	Synovectomy Excise scar and CH ligament; manipulate
Subscapularis bursa	Dense adhesions.	Excise adhesions
Axillary recess	Diffuse synovitis & contracture.	Synovectomy and manipulation.
Subacromial bursa	Chronic bursitis & adhesions.	Subacromial decompression

Stages of Frozen Shoulder

Nevaizer defined four stages of arthroscopic changes in adhesive capsulitis.²² The hallmark is synovitis with capsular contracture in the later stages. Stage 1 imitates rotator cuff impingement since pain is the main complaint and motion is normal.

Stage	Pathology	Physical	Teat
1	Low-lying fibrinous synovitis, no capsular contracture.	Pain, Normal range of motion	PT
2	Increased synovitis, with fibrinous adhesions, and capsular contracture.	Pain, Restricted range of motion	PT)) Manip

3	Subsiding synovitis and increased capsular contracture.	Less pain, loss of motion.	PT>> Manip
4	Only capsular contracture no intraarticular process	loss of motion, pain at the extremes of motion	PT>> Manipu

Clinical Presentation: Patient groups with adhesive capsulitis

Motion	Response to exercise	Decision
Abduction <45-90°	Rapid improvement	Well 3-6 months
Abduction <45-90°	No improvement 4-6 wks	Manipulate+arthroscope Resect adhesions prn
Abduction 90-135°	Rapid improvement	Well 3-6 months
Abduction 90-135°	No improvement	Suspect primary OA Dx arthroscopy

MANIPULATION

Lack of progressive improvement after a many months of an exercise program is an indication for manipulation. Analgesics, nonsteroidal antiinflammatory, intraarticular steroids, and ice complement the exercise program.

Currently, I perform diagnostic arthroscopy before manipulation. Use the standard 4.0 arthroscope or the smaller 3.0 arthroscope from the posterior portal. A complete diagnostic arthroscopy is possible but tedious. Usual findings are a thickened scarred rotator interval, synovitis with adhesions about the subscapularis and biceps tendon, small joint space, and a small axillary dependent fold. Next, create an anterior portal using the Wissinger rod technique. Inspect the subscapular bursa for adhesions. The author has observed capsular rupture, by direct anterior viewing,

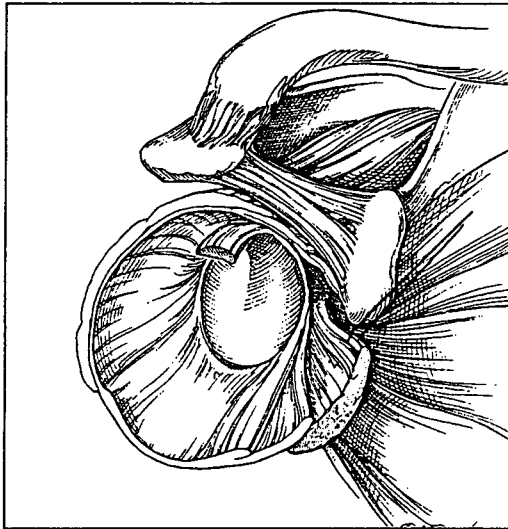


Fig 1. Suture on the subscapularis showing the normal recess.

while manipulating the arm. An alternative is to remove the arthroscope from the glenohumeral joint, manipulate the arm, and then reinsert the arthroscope. The arm may also be manipulated prior to insertion of the arthroscope.

Forty(40) treated from 1984 to 1992 had an arthroscopic debridement following manipulation.^{2 3} The arthroscopic findings in these patients were glenohumeral synovitis and hemorrhage due to rupture of anterior structures(capsule at the rotator interval, MGHL, and IGHL).

The subacromial bursa showed an exuberant subacromial bursitis, that was occasionally hemorrhagic.

Selected Arthroscopic Excision

Ten(10) patients had a diagnostic arthroscopy and selected arthroscopic excision either before manipulation(7) or after a partial manipulation(3). Arthroscopy demonstrated a thickened scarred rotator interval, synovitis about the subscapularis, and chronic subacromial bursitis. Others have reported the same experience.^{24 25 26}

Arthroscopic surgery consisted of arthroscopic resection of the following structures:

- 1) Rotator interval
- 2) MGHL
- 3) Subscapularis bursa
- 4) Subacromial bursectomy
- 5) ASAD if Type II/III acromion

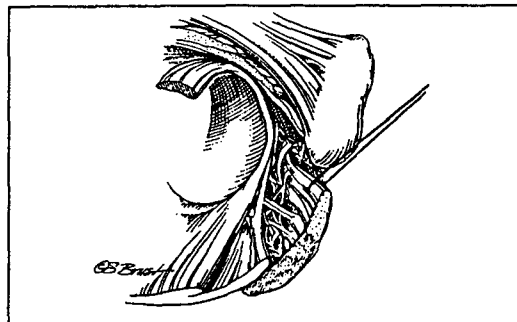


Fig 2. A dhesions between the subscapularis and MGHL.

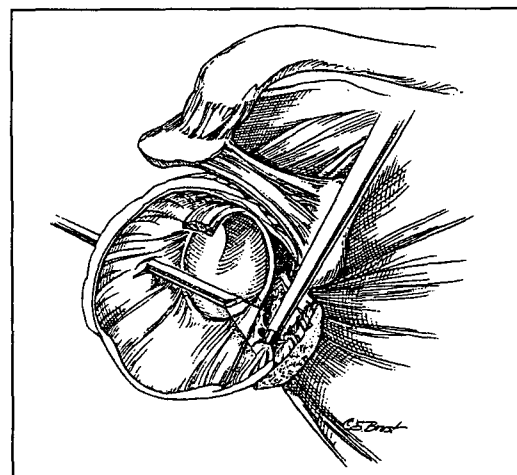


Fig 3. Resection of adhesions and MGHL.

- 6) Excision of CA ligament
- 7) Excision of coracohumeral ligament

Conclusion

- 1) Diagnostic arthroscopy yields an early diagnosis of frozen shoulder in the patient with shoulder symptoms.
- 2) Arthroscopy allows evaluation of selected tight structures before manipulation of the frozen shoulder.
- 3) Operative arthroscopy enables selective resection of tight structures in patients with resistant frozen shoulder.

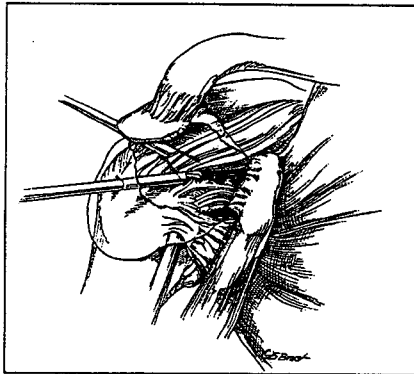


Fig 4. Resection of the CH ligament and ASAD.

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