Acta Scientific Orthopaedics (ISSN: 2581-8635)

Volume 5 Issue 9 September 2022

Case Review

Courrent Concepts: Adhesive Capsulitis of the Shoulder

Pulcinelli FM[1]*, Nannerini M[1], Emanuele G[2] and Libutti E[1]

[1]*Department of Orthopedic and Traumatology, Aurelia Hospital, Rome, Italy*

[2]*Headquarters COMAER - Italian Air Force, Italy*

***Corresponding Author:** Pulcinelli FM, Department of Orthopedic and Traumatology, Aurelia Hospital, Rome, Italy.

DOI: 10.31080/ASOR.2022.05.0545

Received: March 18, 2022

Published: August 05, 2022

Abstract

Adhesive capsulitis is a condition characterised by the spontaneous onset of pain, and progressive movement restriction/limitation. The etiology of adhesive capsulitis of the shoulder is still unknown. Patients often complain about pain, especially overnight, and progressive reduction of range of motion. Conservative treatment can be performed b physioterapy, corticosteroid injection and capsular distension. When conservative treatment fails, surgical treatment is indicated, it is characterized by either open or arthroscopic treatment followed by manipulation. The aim of this article is to provide the literature and our experience results of the most used treatments.

Keywords: Adhesive capsulitis; etiology;

Introduction

Adhesive capsulitis (also termed frozen shoulder, painful stiff shoulder or periarthritis) is a condition characterised by the spontaneous onset of pain, progressive restriction/limitation of movement of the shoulder and disability that reduces the activities of daily life, work and leisure [1-3].

Adhesive capsulitis is prevalent in about 2% of the general population [4].

Type I diabetic patients have 40% likelihood of developing adhesive capsulitis in their lifetime [4] and the same is also for 29% of type II diabetic patients [5]. Hyperthyroidism [6], hypothyroidism [7], Parkinson's disease [8], cardiac disease [9], and autoimmune disorders [10] are also associated with adhesive capsulitis.

Natural history of frozen shoulder (Figure 1) is classically divided into 3 phases [11,12], characterized by the possibility of self-resolution:

- Phase 1, when pain predominates
- Phase 2, when stiffness predominates
- Phase 3, when symptoms begin to solve.

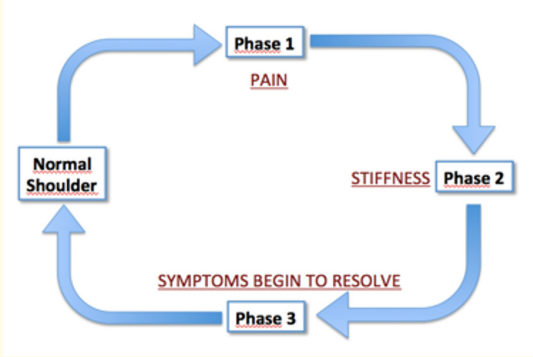

Figure 1: Natural history of frozen shoulder.

Etiology

The etiology of adhesive capsulitis of the shoulder is still unknown.

Microscopically, the frozen shoulder is characterized by both matrix of type I and III collagen populated and by fibroblasts and myofibroblasts that suggest the condition may be modulated by an abnormality in the production of cytokines and growth factors [13].

Macroscopically the cascade of inflammation occurs with a progressive fibrosis and contracture at the joint capsule of the shoulder [4]. Hi V. Le [40] suggested a genetic predisposition to adhesive capsulitis, patients with a positive family history, and patients with HLA-B27 gene expression that are considered risk factors.

Clinical presentation, evolution

The diagnosis is clinical. Patients often complain about pain, especially overnight, and progressive reduction of the range of motion. Although adhesive capsulitis is described as a self-limiting disorder [14], yet this condition can sometimes last for years and ten percent of patients report persistent pain [15] and mild restrictions [16].

Diagnosis is performed only clinically, indeed there is no method of instrumental diagnosis for frozen shoulder.

Conservative treatment

Physiotherapy

- There are no physiotherapical standardized protocols for the treatment of adhesive capsulitis.
- Usually, capsular stretching exercises and manual therapy are carried out.
- Kwaees., *et al*. [17] reported that low grade physiotherapy programmes (movements within the comfort zone) may show better long term outcome as compared to high intensity (movements at the limit of pain tolerance) programmes [18,19].
- In their review Page., *et al*. [20] reported that no trials have investigated the effect of the combination of manual therapy and stretching exercises compared with either placebo or no treatment for adhesive capsulitis, and the best results occur when physiotherapy is combined with both steroid injections and joint distention.
- Klç., *et al*. [21] maintain that suprascapular nerve block is a safe and well-tolerated method and the addition of this technique to physiotherapy improved functional status and pain levels in patients with adhesive capsulitis.

Analgesia and anti-inflammatory drugs

Ranalletta., *et al*. [22] reported results on 74 patients with primary adhesive capsulitis in the freezing stage treated with either intra-articular injections with betamethasone or oral NSAIDs, and the results showed that in patients with adhesive capsulitis, a single corticosteroid injection applied without any image control, provides faster pain relief and earlier improvement of both the shoulder function and motion compared with oral NSAIDs.

Corticosteroid therapy

- In literature many reviews have found there are benefits from corticosteroid injections as they lead to fast pain relief and improvement of range of motion in the treatment of the adhesive capsulitis [23-25].
- In their review, also Song., *et al*. [26] report that Corticosteroid injections offer rapid pain relief and an improved range of motion in the short-term, although long-term outcomes seem to be similar to other treatments including placebo, and Image-guided corticosteroid injections increase the accuracy of the injection, which may improve shoulder outcomes.
- Corticosteroid can be dosed orally or as intra-articular injection, Olaf Lorbach., *et al*. [27] reported the results on 40 patients treated either with oral corticosteroid or 3 intra-articular injections of corticosteroids, and conclude that the use of corticosteroids in the treatment of idiopathic shoulder adhesive capsulitis leads to fast pain relief and improves the range of motion, and intra-articular injections of glucocorticoids showed superior results compared with a short course of oral corticosteroids.

Capsular distension

- Capsular distension and subsequent intensive rehabilitation has a beneficial effect, and this combination enables rapid improvement, and shows results already after one-week treatment [28].

- Previously, in 2008, Buchbinder., *et al*. [29] showed that arthrographic distension with saline and steroid provides short-term benefits in pain relief, range of movement and function in adhesive capsulitis, but it is uncertain whether this is better than alternative interventions.

- In 2014 Sun Wook Park., *et al*. [30] reported results on 53 patients treated by capsular distension and then intensive rehabilitation, the results showed that this technique can help control inflammation, extend joint space, and recover ROM, in comparison to patients treated with intensive mobilization, one steroid injection with capsular distension, and general physical therapy only.

Surgical treatment

Surgical treatment may lead to long-term improvement, but involves ~~to~~ surgery-related risks. It is destined to patients who had conservative treatment failure. The manipulations, performed under sedation, cause small passive tears of excessively contracted, inflamed and rigid ligaments and capsule. They lead to a rapid improvement of the range of motion but expose to a risk of fracture or tendon or labral injury [31,32]. As confirmed by Bloom JE., *et al*. [31], arthroscopic arthrolysis is the most used surgery, and it is demonstrated that it is able to give satisfactory results and especially durable in terms of improvement of the symptomatology. There is a large variety of ways in which arthroscopic arthrolysis is performed: for this purpose it can be as a simple partial capsular release or a 360 degree arthrolysis [31]. "Open" capsular arthrolysis is generally indicated: in case of failure of the other treatments, in case of extracapsular contractures, or when arthroscopic instruments are not available [31,33,34].

As for the guidelines, there is still no general consensus on which type of procedure is best.

In our experience, arthroscopic arthrolysis (Figure 2, 3, 4, 5) followed by manipulations under sedation represent the gold standard, in case the patient does not respond to conservative treatment.

~~Walther M.,~~ *et al.* [32] in a retrospective study carried out on 54 cases showed that arthroscopic capsular release could be recommended as the first choice treatment in patients with "PERSISTENT stiff SHOULDER".

Fernandes M., *et al*. [35] showed how arthroscopic arthrolysis, in adhesive capsulitis refractory to conservative treatment, is able to give a significant improvement in range of motion at a minimum follow-up of 6 years.

He Y., *et al*. [36] showed how arthroscopic release, compared with standard rehabilitation procedures, helps patients go back to earlier usual daily life, but without any evidence of long-term maintenance of this advantage.

Smith CD., *et al*. [37] carried out a study on a large cohort of patients with precise and isolated diagnosis of idiopathic adhesive capsulitis (II stage), they showed that arthroscopic arthrolysis is a rescue procedure with a rapid improvement of painful symptoms and with a marked improvement in the joint range.

Dattami R., *et al*. [38] showed how arthrolysis is able to produce an improvement in the quality of life of patients regardless of the duration of painful symptoms at the time of diagnosis.

Mehta SS. [39] carried out a study comparing the clinical results of arthroscopic arthrolysis in diabetic patients with stiff shoulder versus non-diabetic patients. The results showed that diabetic patients, showed an improvement of range of motion in the short term, but the tendency to persistent joint limitation in the medium and long term.

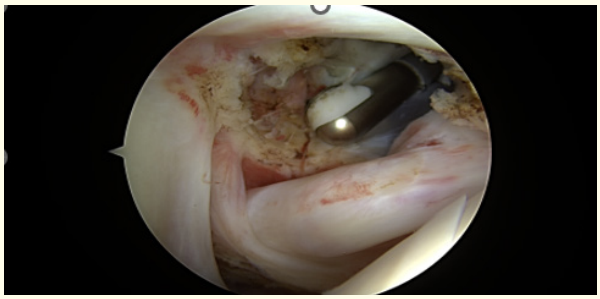

Figure 2: View from posterior portal is performed rotator interval arthrolysis.

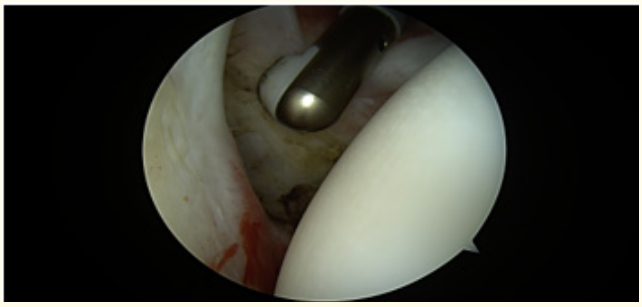

Figure 3: View from posterior portal is performed anterior arthrolysis.

Figure 4: View from anterior portal is performed posterior arthrolysis.

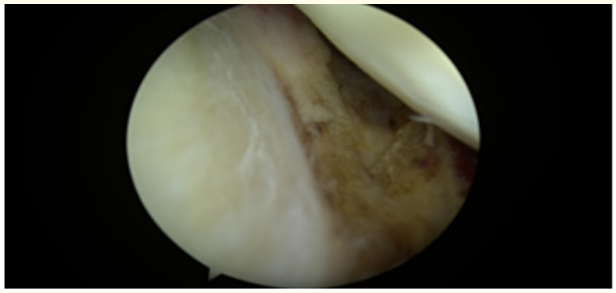

Figure 5: View from posterior portal is performed inferior arthrolysis.

Conclusion

The authors review the literature and present the results of the most used treatments for adhesive capsulitis. The authors indicate that is important to recognize adhesive capsulitis and to make early treatment with relevance to intraarticular injection, capsular distension and physiotherapy. Failure of conservative treatment may result in surgical treatment characterized by arthroscopic arthrolysis followed by manipulations in sedation. Surgical treatment and conservative treatment must be followed by an intense physiotherapy protocol and represents the gold standard for the treatment of adhesive capsulitis.

Bibliography

1. Codman EA. "The Shoulder". Boston: Thomas Toddog (1934)
2. Neviaser JS. "Adhesive capsulitis of the shoulder: a study of the pathological findings in periarthritis of the shoulder". *Journal of Bone and Joint Surgery* 27 (1945): 211-222.
3. Reeves B. "The natural history of the frozen shoulder syndrome". *Scandinavian Journal of Rheumatology* 4 (1975): 193-196.
4. Tasto JP and Elias DW. "Adhesive capsulitis". *Sports Medicine and Arthroscopy Review* 15.4 (2007): 216-221.
5. Balci N., *et al*. "Shoulder Adhesive Capsulitis and Shoulder Range of Motion in Type II Diabetes Mellitus: Association with Diabetic Complications". *Journal of Diabetes Complications* 13.3 (1999): 135-140.
6. Wohlgethan JR. "Frozen shoulder in hyperthyroidism". *Arthritis and Rheumatology* 30.8 (1987): 936-939.
7. Bowman CA., *et al*. "Case report: bilateral adhesive capsulitis, oligoarthritis and proximal myopathy as presentation of hypothyroidism". *Rheumatology* 27.1 (1988): 62-64.
8. Riley D., *et al*. "Frozen shoulder and other shoulder disturbances in Parkinson's disease". *Journal of Neurology, Neurosurgery, and Psychiatry* 52.1 (1989): 63-66.
9. Tuten HR., *et al*. "Adhesive capsulitis of the shoulder in male cardiac surgery patients". *Orthopedics* 23.7 (2000): 693-696.

10. Ewald A. "Adhesive Capsulitis: A Review". *American Family Physician* (2011).

11. Reeves B. "Stages of Frozen Shoulder 4". *Scandinavian Journal of Rheumatology* (1975): 193-196.

12. Tariq Adam Kwaees and Charalambos P Charalambous. "Surgical and non-surgical treatment of frozen shoulder. Survey on surgeons treatment preferences". *Muscles, Ligaments and Tendons Journal* 4.4 (2014): 420-424.

13. Bunker TD., *et al*. "Expression of growth factors, cytokines and matrix metalloproteinases in frozen shoulder". *The Bone and Joint Journal* 82 (2000): 768-773.

14. Grey RG. "The natural history of ''idiopathic'' frozen shoulder". *The Bone and Joint Journal* Am 60 (1978): 564.

15. Ogilvie-Harris DJ., *et al*. "The resistant frozen shoulder. Manipulation versus arthroscopic release". *Clinical Orthopaedics and Related Research* 319 (1995): 238-248.

16. Jerosch J and Fayaz HC. "Orthopedic refresher. Adhesive capsulitis". Etiology, diagnosis and therapy]". *Z Orthop Ihre Grenzgeb* 143 (2005): R21-37.

17. Tariq Adam Kwaees and Charalambos P Charalambous. "Surgical and non-surgical treatment of frozen shoulder. Survey on surgeons treatment preferences". *Muscles, Ligaments and Tendons Journal* 4.4 (2014): 420-424.

18. Russell S., *et al*. "A blinded, randomized, controlled trial assessing conservative management strategies for frozen shoulder". *Journal of Shoulder and Elbow Surgery/American Shoulder and Elbow Surgeons* 23.4 (2014): 500-507.

19. Jain TK and Sharma NK. "The effectiveness of physiotherapeutic interventions in treatment of frozen shoulder/adhesive capsulitis: A systematic review". *Journal of Back and Musculoskeletal Rehabilitation* 27.3 (2014): 247-273.

20. Page MJ., *et al*. "Manual therapy and exercise for adhesive capsulitis (frozen shoulder)". *Cochrane Database of Systematic Reviews* 8 (2014): CD011275.

21. Klç Z., *et al*. "Addition of Suprascapular Nerve Block to a Physical Therapy Program Produces an Extra Benefit to Adhesive Capsulitis: A Randomized Controlled Trial". *American Journal of Physical Medicine and Rehabilitation* 94 (2015): 912-920.

22. Ranalletta M., *et al*. "Corticosteroid Injections Accelerate Pain Relief and Recovery of Function Compared With Oral NSAIDs in Patients With Adhesive Capsulitis: A Randomized Controlled Trial". *The American Journal of Sports Medicine* (2015).

23. Griesser MJ., *et al*. "Adhesive capsulitis of the shoulder: a systematic review of the effectiveness of intra-articular corticosteroid injections". *The Journal of Bone and Joint Surgery Am* 93.18 (2011): 1727-1733.

24. Blanchard V., *et al*. "The effectiveness of corticosteroid injections compared with physiotherapeutic interventions for adhesive capsulitis: A systematic review". *Physiotherapy* 96.2 (2010): 95-107.

25. Shah N and Lewis M. "Shoulder adhesive capsulitis: systematic review of randomised trials using multiple corticosteroid injections". *British Journal of General Practice* 57.541 (2007): 662-667.

26. Amos Song., *et al*. "Glenohumeral corticosteroid injections in adhesive capsulitis: a systematic search and review". *PM R* 6.12 (2014): 1143-1156.

27. Olaf Lorbach., *et al*. "Nonoperative management of adhesive capsulitis of the shoulder: Oral cortisone application versus intra-articular cortisone injections". *Journal of Shoulder and Elbow Surgery* 19 (2010): 172-179.

28. Elleuch MH., *et al*. "The contribution of capsular distension to the treatment of primary adhesive capsulitis of the shoulder: a comparative study versus rehabilitation". *Annals of Physical and Rehabilitation Medicine* 51 (2008): 722-728.

29. Buchbinder R., *et al*. "Arthrographic distension for adhesive capsulitis (frozen shoulder)". *Cochrane Database of Systematic Reviews* 1 (2008): CD007005.

30. Sun Wook Park., *et al*. "The Effectiveness of Intensive Mobilization Techniques Combined with Capsular Distension for Adhesive Capsulitis of the Shoulder". *The Journal of Physical Therapy Science* 26 (2014): 1767-1770.

31. Grant JA., *et al*. "Comparison of manipulation and arthroscopic capsular release for adhesive capsulitis: A systematic review". *Journal of Shoulder and Elbow Surgery/American Shoulder and Elbow Surgeons* 22.8 (2013): 1135-1145.

32. Walther M., *et al*. "Frozen shoulder--comparison of different surgical treatment options". *Acta Orthopaedica Belgica* 80.2 (2014): 172-177.

33. Bloom JE., *et al*. "Image-guided versus blind glucocorticoid injection for shoulder pain". *The Cochrane Database of Systematic Reviews* (2012): 8.

34. D'Orsi GM., *et al*. "Treatment of adhesive capsulitis: A review". *Muscles, Ligaments and Tendons Journal* 2.2 (2012): 70-78.

35. Fernandes M. "Arthroscopic treatment of refractory adhesive capsulitis of the shoulder". *Revista do Colégio Brasileiro de Cirurgiões* 41.1 (2014): 30-35.

36. He Y., *et al*. "Case-control study o manipulation following arthroscopic capsular release for the treatment of frozen shoulder". *Zhonnqquo Gu Shanq* 27.4 (2014): 299-302.

37. Smith CD., *et al*. "Arthroscopic capsular release for idiopathic frozen shoulder with intra-articular injection and a controlled manipulation". *Annals of The Royal College of Surgeons of England* 96.1 (2014): 55-60.

38. Dattani R., *et al*. "Improvement in quality of life after arthroscopic capsular release for contracture of the shoulder". *Bone Joint Journal* 95-B.7 (2013): 942-946.

39. Metha SS., *et al*. "Comparative outcome of arthroscopic release for frozen shoulder un patients with and without diabetes". *Bone Joint Journal* 96-B.10 (2014): 1355-1358.

40. Le HV., *et al*. "Adhesive capsulitis of the shoulder: review of pathophysiology and current clinical treatments". *Shoulder Elbow* 9.2 (2017): 75-84.