

A Case of Spinoglenoid Notch Ganglion Causing Suprascapular Nerve Entrapment

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Abstract: *Suprascapular nerve entrapment secondary to spinoglenoid notch ganglion is a known but uncommon entity causing chronic shoulder pain and weakness in the overhead activities. We present a rare case of such entity in a young serving naval sailor.*

Keywords: Suprascapular nerve entrapment, chronic pain shoulder, spino-glenoid cyst

1. Introduction

Suprascapular nerve entrapment secondary to spinoglenoid notch ganglion¹ is a known but rare and uncommon³ entity usually go undiagnosed causing chronic shoulder pain and weakness in the overhead activities².

Shoulder pain and dysfunction has always perplexed clinicians. Armed with accurate diagnostic tools, today one can differentiate between the articular, capsular, musculoskeletal, neurological and cervical causes of the entity. Despite these, a beneficial outcome following a diagnosis is subjective and far from satisfaction to many, requiring protracted life style modifications and restrictions. However, in few with Suprascapular nerve entrapment caused due to Spino-glenoid notch ganglion, the return of normal activity is complete after a successful diagnosis and treatment. Though considered rare, with advent of MRI there is a steady rise in the detection rate. We present of a case of spinoglenoid ganglion causing suprascapular nerve entrapment.

2. Case Report

A 25 yr old, physically active serving naval sailor presented with complaints of Rt shoulder pain with restriction and weakness of over head abduction of 06 months duration. There was no history of trauma due to any weight lifting or fall. On examination of his Right shoulder, there was isolated right Infraspinatus muscle wasting (Fig 1). Despite having full range of movements at the affected shoulder joint, the power of abduction and external rotation was grade III. There were no other positive findings. A clinical diagnosis of Right Upper brachial plexus paresis involving C5 post ganglionic spinal nerve (Sunderland -I)⁵ was made. A MRI right brachial plexus and shoulder JT done revealed normal right brachial plexus. However, a hyper intense lesion in the right spinoglenoid notch, not communicating with the glenoid labrum was detected which was in close proximity to suprascapular nerve probably causing compression of the nerve (Fig1). Surgical decompression was planned. Ultrasound of the lesion as preoperative road map was carried to determine the surgical access. The sailor underwent exploration through posterior approach⁶, inferior to the lateral half of the scapular spine (Fig 2). The lesion was accessed deep to suprascapular muscle lying superficial to the tendinous part of the infraspinatus muscle at the spinoglenoid notch extending inferiorly into the infraspinatus fossa lateral to, free from the joint capsule

lying superior, and lateral to the nerve. The cystic lesion was dissected carefully and excised. There no attempt made to identify the suprascapular nerve. Post op recovery was uneventful with complete disappearance of the painful arc within 06 weeks associated with regain of the bulk of Infraspinatus muscle. The power of abduction and external rotation to grade IV/V (Fig 3). Post operative USG of the right shoulder reveals complete disappearance of the lesion.

3. Discussion

Suprascapular nerve arises from upper trunk at the Erb's point deriving its fibres from C5 and C6 root⁷. It is a mixed nerve. The motor component innervates the suprascapular and infraspinatus muscles responsible for the abduction and the external rotation of the shoulder joint respectively⁸. The proprioceptive afferents are received from the glenohumeral joint, acromioclavicular joint, sub acromial bursa and the scapula. No known cutaneous innervations are known. After its origin from the Erb's point it travels posterior and parallel to the posterior belly of the omohyoid muscle anterior to trapezius on the superior border of scapula⁹. After passing through the suprascapular notch deep to the superior transverse scapular ligament, it enters the suprascapular fossa deep to the infraspinatus muscle which it innervates from the undersurface of the muscle⁹. At this point it receives its proprioceptive fibres. It travels laterally towards and arches around the lateral aspect of the spine of the scapula through a tight compartment formed by spinoglenoid notch deep to the inferior transverse scapular ligament also named as spinoglenoid ligament, to enter the infraspinatus fossa¹⁰ lying on the undersurface of the infraspinatus muscle which it innervates lateral to the glenoid labrum.

The injury to suprascapular nerve can occur at any level. Avulsion injury from the Erb's point usually occurs in tractional injury to the brachial plexus¹¹. The tight triangular suprascapular notch is also a common site for tractional injury to the suprascapular nerve commonly seen after chronic over head abduction activities. The third common site of tractional injury to the nerve is at the spinoglenoid notch where it travels within a tight triangular space at the lateral edge of the spine of the scapula with spinoglenoid ligament forming its roof this occurs in activities involving cross adduction activities or internal rotation of the humeral head¹¹. Entrapment of the nerve due to space occupying lesion most commonly occur at the spinoglenoid notch¹². Ganglions which are outpouching of synovial membrane

through micotears in the glenoid labrum are the commonest space occupying lesions causing compression¹³. Though Hematomas, Vascular anomalies, Subacromial bursitis, myogenic tumors, Periarthritis, Post fracture callus entrapment can be present but are uncommon.

Clinical manifestation depends upon the level of injury. Combined supraspinatous and infraspinatous wasting are seen in the circumstances where the injury is proximal to the spinoglenoid notch. Injuries to the nerve at the spinoglenoid notch cause only infraspinatous muscle wasting¹⁴, as was seen in our case. Despite having clinically visible wasting, the range of movements, especially the overhead abduction and the external rotation at the joint is full but the powers of movements are reduced to Grade III - IV. There is chronic dull aching pain in the posterior aspect shoulder joint which is brought about by overhead abduction and cross adduction in cases of entrapment in suprascapular notch, whereas the entrapment of the nerve in spinoglenoid notch causes pain during joint internal rotation of the glenohumeral joint during which the spinoglenoid ligament is stretched tightly over the nerve¹⁵.

Though the diagnosis is usually by exclusion, isolated muscle atrophy on clinical examination provides an important clinical clue¹⁴. MRI of the brachial plexus and the affected shoulder is very sensitive in tracking the suprascapular nerve and any external pathology causing compression¹⁶. In absence of any positive imaging findings EMG of the involved muscle and the nerve conduction velocities of the suprascapular nerve can indicate tractional or entrapment neuropathies¹⁷. The treatment can be both conservative and invasive. In cases of tractional injuries with normal range of movements at the shoulder joint a trial of conservative management is provided¹⁸. However if the symptoms persists beyond six months surgical decompression is done by either dividing the suprascapular ligament or the spinoglenoid ligament depending upon the level of injury. In case of compressive neuropathy conservative management usually fail. Spinoglenoid ganglion rarely involutes by itself. A surgical excision ensures completeness of the procedure with no recurrence rate¹⁹. Approach to the lesion can either be arthroscopically with or without additional extra articular port access, or by open access. Ultrasound, or CT guided aspiration of the cyst is known however the recurrence rate are high.

In our case the lesion was large measuring 3 cm in diameter, multiloculated and was not communicating with the joint capsule. The glenoid labrum and the capsule were intact. Arthroscopic approach was therefore not taken. Handful of studies were conducted in the past to compare various treatment modalities. Surgical excision of the cyst ensures complete cure and have shown better results than the conservative management.

4. Conclusion

Suprascapular nerve entrapment neuropathy due to spinoglenoid ganglion is rare but treatable condition. Preoperative MRI localization of the cyst and its relationship with the glenoid labrum is essential to determine the surgical

approach. Surgical excision ensures complete recovery with return of normal neurological function.

References

- [1] S. Lichtenberg, P. Magosch, and P. Habermeyer, "Compression of the suprascapular nerve by a ganglion cyst of the spinoglenoid notch: the arthroscopic solution," *Knee Surgery, Sports Traumatology, Arthroscopy*, vol. 12, no. 1, pp. 72–79, 2004
- [2] R. E. Boykin, D. J. Friedman, L. D. Higgins, and J. J. P. Warner, "Suprascapular neuropathy," *Journal of Bone and Joint Surgery A*, vol. 92, no. 13, pp. 2348–2364, 2010
- [3] Thompson RC Jr, Schneider W, Kennedy T (1982) Entrapment neuropathy of the inferior branch of the suprascapular nerve by ganglia. *Clin Orthop* 166:185–187
- [4] Kopell HP, Thompson WAL. Peripheral entrapment neuropathies. Baltimore: Williams and Wilkins, 1963:131-42.
- [5] A classification of peripheral nerve injuries producing loss of function. SUNDERLAND S.
- [6] Suprascapular Neuropathy Romeo, Rotenberg, Bach, *JAAOS - Journal of the American Academy of Orthopaedic Surgeons*: November- December 1999 - Volume 7 - Issue 6 - p 358–367
- [7] Mumenthaler M. Nervussuprascapularis. In: Mumenthaler M, Schliak H, editors. *Laesionenperipherer Nerven. Diagnostik und Therapie*. 6th ed. New York: Georg Thieme Verlag, 1993:236-9.
- [8] Yan J, Horiguchi M (2000) The communicating branch of the 4th cervical nerve. *Surg Radiol Anat* 22:175–179
- [9] Sunderland S (1968) Nerves and nerve injury. E & S Livingstone
- [10] Entrapment of the distal suprascapular nerve An anatomical study A. KaspP, J. Yanai , C. G. Pick , and G. Mann
- [11] Suprascapular nerve injuries Raasch, William MD; Zebrack, John MD, *Current Opinion in Orthopaedics*: August 2003 - Volume 14 - Issue 4 - p 252–254
- [12] Suprascapular nerve entrapment at the Rachbauer 1996
- [13] SLAP repair with arthroscopic decompression of the spinoglenoid cyst Hiroshi Hashiguchi1, Satoshi Iwashita1, Atsushi Ohkubo1, and Shinro Takai EDP Sciences, 2016 DOI: 10.1051/sicotj/2015036
- [14] Suprascapular nerve lesions at the spinoglenoid notch Liveson et al, *Journal of Neurology, Neurosurgery, and Psychiatry* 1991;54:241-243
- [15] Aiello I, Serra G, Traina GC, Tugnoch V. Entrapment of the suprascapular nerve at the spinoglenoid notch. *Ann Neurol* 1982;12:314-6.
- [16] Ganglion causing paralysis of the suprascapular nerve: Diagnosis by MRI and ultrasonography Kenji Takagishi, *Acta Orthopaedica Scandinavica*, 62:4, 391-393, DOI: 10.3109/17453679108994480
- [17] A new strategy for treatment of suprascapular entrapment neuropathy in athletes: Shaving of the base of the scapular spine. Hama H¹, Ueba Y, Morinaga T, Suzuki K, Kuroki H, Yamamoto T. *J Shoulder Elbow Surg*. 1992 Sep;1(5):253-60. doi: 10.1016/S1058-2746(09)80067-0

[18] Martin SD, Warren RF, Martin TL, Kennedy K, O'Brien SJ, Wickiewicz TL. Suprascapular neuropathy. Results of non-operative treatment. J Bone Joint Surg Am. 1997;79:1159-65

[19] Entrapment of the suprascapular nerve, Th. Fabre, C. Piton, G. Leclouerec, F. Gervais-Delion, A. Durandau

Figures



Figure 1: Pre-operative images showing isolated Rt Infrascapular muscle weakness. MRI RT Shoulder revealed a multiloculated hyperintense cystic lesion in spinoglenoid Notch deep to the Supraspinatous muscle

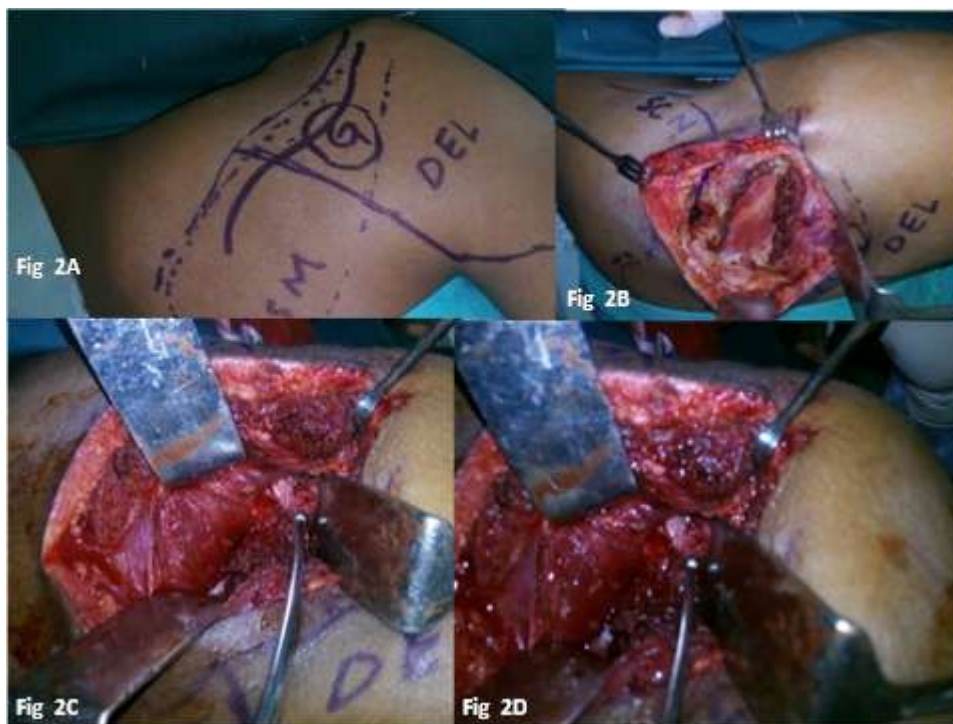


Figure 2: Operative images showing the posterior approach taken inferior to the lateral half of spine of the scapula. The ganglion was identified deep to the Supraspinatous muscle after dividing the trapezius muscle and retracting the tendinous part of the Supraspinatous muscle superiorly.



Figure 3: Post- operative status revealing return of the infraspinatus muscle bulk and power