



MORPHOLOGICAL STUDY OF SUPRASCAPULAR NOTCH AND OSSIFIED SUPERIOR TRANSVERSE SCAPULAR LIGAMENT – RISK FACTOR FOR SUPRASCAPULAR NERVE ENTRAPMENT.

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ABSTRACT

The suprascapular notch is a depression on lateral part of superior border of scapula, medial to the coracoid process, is bridged by the superior transverse scapular ligament, which is sometimes ossified and the convert the notch into foramen transmit suprascapular nerve to supraspinous fossa. Variation in morphology of suprascapular notch have identified as one of the cause for suprascapular nerve entrapment. The purpose of this study is to investigate the influence of the STSL on the reduced space for suprascapular nerve passage at the suprascapular notch.

SUMMARY: Out of 200 dry scapulas, we found 6 scapulae with completely ossified superior transverse scapular ligament out of which 5 are of right side one is of left side. All five scapulas are of male and one belongs to female.

KEYWORDS : suprascapular notch, nerve entrapment, spinoglenoid distance

INTRODUCTION:

The suprascapular notch (SSN) is a depression located in the lateral part of superior border of the scapula, medial to the base of the coracoids process. The superior transverse scapular ligament (STSL) connect two borders of the suprascapular notch on its upper edge converts the notch in to a foramen. Suprascapular nerve passes through this foramen where as suprascapular vessels passes above the foramen. Clinically most important place on the scapula is suprascapular notch because it is land mark for locating suprascapular nerve. Suprascapular nerve entrapment is an acquired neuropathy which is secondary to the compression of nerve, in the bony suprascapular notch. The suprascapular nerve receive fibers from C5 and C6 nerve roots occasionally from C4, and it provide motor innervations to the supraspinatous and infraspinatous muscle. It also gives branches to corcohumeral and coracoacromial ligament, subacromial bursa and the acromioclavicular joint. Suprascapular nerve entrapment results in deep and diffused poorly localized pain in the areas f distribution, weakness of abduction and external rotation of shoulder joint, atrophy of supraspinatous and infraspinatous muscle. Due to non specific symptoms results in late diagnosis and difficult in treatment. The suprascapular notch is an important landmark of suprascapular nerve during arthroscopy, during open surgical procedure the distance between suprascapular notch and glenoid cavity is very important. Knowing the anatomical variations in detail along with the course suprascapular nerve is helpful for better understanding of the location and source of the entrapment syndrome.

MATERIAL METHODS:

This study was conducted using 200 randomly collected adult cadaveric dry scapulae of known sex of both sides (148 female, 52males) of mixed Indian population from. The study design was cross sectional and observational. only adult skeleton with closed epiphysis were considered for analysis, we kept certain point were in mind before taking the scapula into study to assure that the measurement taken were as accurate as possible and not biased because of old age, any other gross abnormalities.

The scapulas with fallowing features were excluded from the study:

1. Non ossified scapula
2. Developmental anomalies of scapula
3. Fractured and pathological scapula

METRICAL STUDY:

We measured the maximum depth of suprascapular notch (MDSSN) by drawing an imaginary line from superior corners of notch to the deepest point of suprascapular notch and identified various shapes of notches. The length of superior transverse scapular ligament

measured from the horizontal distance between proximal and distal boundaries of ligament.

RESULTS:

Out of 200 dry scapulas, we found 6 scapulae with completely ossified superior transverse scapular ligament out of which 5 are of right side one is of left side. All five scapulas are of male and one belongs to female (Fig-1&2). Average depth of suprascapular notch is 2.2mm, and the average length of superior transverse scapular ligament is 1.95cm.

Table-1 Incidence of completely ossified STSL

No of specimens	Gender		Side		Ossified STSL				Percentage
	female	male	right	left	M	F	R	L	
200	148	52	100	100	5	1	5	1	3%

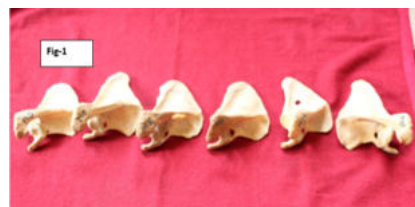
Table-2 Depth of suprascapular notch

S.no	Side	Sex	Depth (mm)
1.	R	M	2mm
2.	R	F	2.3mm
3.	R	M	2.1mm
4.	R	M	1.9mm
5.	R	M	2.4mm
6.	L	M	2.5mm

Table-3 Length of superior transverse scapular ligament (STSL)

S.no	Side	Sex	Length (cm)
1.	R	M	1.8
2.	R	F	1.9
3.	R	M	2.2
4.	R	M	2.1
5.	R	M	1.7
6.	L	M	2

Fig -1&2 Showing ossified superior transverse scapular ligament (STSL)





DISCUSSION:

There are many studies on variations of suprascapular notch, these variation have been studied in different population. Various classifications have been used to describe the suprascapular notch. Some authors have found direct correlation between notch type and suprascapular nerve entrapment, but did not take ossification of suprascapular ligament into consideration. Kopell and Thompson was first described the entrapment of suprascapular nerve at the suprascapular notch(1) Ticker et al in their study stated that the scapula with an ossified suprascapular ligament resulting in suprascapular foramen have been classified as type –III.(2) Rengachary et al classified the suprascapular notch in to six types based on its shape. Type-1 entire superior border of scapula shows wide depression from the medial superior angle to the base of the coracoid process, type-2 a wide blunt V-shaped notch, type-3 a symmetrical U shaped notch with parallel margins, type-4 a small V-shaped notch, type-5 similar to type 3 with medial part of ligament ossified, type-6 with ligament completely ossified forming foramen. (3)

In present study the incidence of type-6 notch was 3% out of 200 dry scapulae. The reason for a greater incidence of these foramina in male specimens is not clear, but involvement right side more often than left sides may be due to a predilection for right-handedness in general population. Ossification of STSL may alter the attachment of omohyoid muscle, which has its attachment close to it. The lateral border of scapula had a projection and it may have distorted the attachment of the omohyoid muscle, there by altering its action.

The presence of ossified STSL may also pose a challenge during decompression of the notch if the condition is not fully appreciated. The incidence of ganglionic cyst and other variations occur along the course of nerve. When we compare the present study with previous studies Vandhana and Sudha et al found the highest incidence of STSL

Table-4 Comparison of various studies on incidence of ossified STSL

S.NO	Author	Total no of scapula	No of scapula with suprascapular foramen	Percentage
1.	Iqbal et al (4)	250	0	0%
2.	Muralidhar reddy (5)	103	2	1.93%
3.	Vyas et al (6)	300	11	3.67%
4.	kalpana et al (7)	100	2	2
5.	Jadhve et al (8)	350	37	10.57
6.	Vandana& sudha et al (9)	134	17	12.6
7.	Pragna et al (10)	80	3	3.75
8.	Kajava et al (11)	133	-	1.5%
9.	Oliver(12)	-	-	5.65%

10.	Khan et al (13)	Single case	-	-
11.	Das et al (14)	Single case	-	-
12.	Usha kannan (15)	400	40	10
13.	Present study	200	6	3%

CONCLUSION:

The role of suprascapular transverse ligament in causing suprascapular nerve is known fact hence, better understanding of the topographical anatomy and their morphometric variation may helpful for the clinicians for making good diagnosis and proper planning of surgical intervention.

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