

MORPHOLOGY OF SUPRASCAPULAR NOTCH: A STUDY ON 176 DRY SCAPULAE

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ABSTRACT

Back ground: Suprascapular notch (SSN) is present along the superior border of the scapula. It is bridged by the suprascapular ligament. Suprascapular nerve passes inferior to it. Suprascapular nerve entrapment frequently occurs at the suprascapular notch. A narrow notch or the ossified suprascapular ligament is the frequently encountered culprits.

Aim: To study the morphology of suprascapular notch among 176 dry scapulae.

Materials and Method: The study was conducted on 176 adult dry human scapulae in the department of Anatomy, KIMS, Bangalore. Among 176 scapulae 88 were right sided & 88 left sided. Various shapes of scapular notches were noted & classified into 6 types based on Rengachary classification.

Results: The most common type of suprascapular notch in the study is Type II (R-24, L-37) & least common is Type VI (R-5, L-5). Suprascapular notch was absent in 8 Scapulae.

Conclusion: We could find all the 6 types of scapular notches, most common type being type II ((34.65%) and least common type - type VI. This study is an attempt to know the various shapes of suprascapular notch.

KEY WORDS: Suprascapular notch, Completely ossified, Suprascapular nerve.

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INTRODUCTION

Suprascapular notch (SSN) is one of the most clinically important sites on the scapula, which is a depression present on the superior border of scapula just medial to root of coracoid process [1]. Suprascapular notch is bridged by suprascapular ligament which converts the notch into a foramen and this ligament is sometimes ossified. The suprascapular nerve passes through the foramen and the suprascapular vessels above the ligament. After passing through the notch, the nerve enters the suprascapular fossa, where it supplies suprascapular muscle and curves round the lateral border

of the spine of the scapula with the suprascapular artery to reach the infraspinous fossa, where it gives two branches to infraspinatus and articular rami to the shoulder and acromioclavicular joints [2].

Most suprascapular nerve entrapments occur at the suprascapular notch as a result of compression by the overlying suprascapular ligament [3]. In suprascapular nerve entrapment there is pain in the shoulder and wasting and weakness of suprascapular and infraspinatus muscles [2]. Suprascapular neuropathy is often a big nuisance in individuals who are frequently involved in overhead activities as its frequency

is 33% in international level high performance volleyball players. In the general population 1-5% of shoulder pain is vowed to suprascapular neuropathy. The size and shape of the SSN may be important factors in suprascapular nerve entrapment because narrow SSNs have been found in patients with this syndrome [1]. Considering the anatomical variations, morphological characteristics of SSN and the superior transverse scapular ligament are the most recognized possible predisposing factors for compression of suprascapular nerve at the SSN [4].

MATERIALS AND METHODS

176 adult dry human scapulae irrespective of sex were collected in the Dept. of Anatomy KIMS Bangalore. Among 176 scapulae 88 were right sided & 88 left sided. Various shapes of scapular notches were noted & classified into 6 types based on Rengachary classification i.e. Type I – wide depression along the superior border of scapula from superior angle to base of coracoid process, Type II – a wide, blunt notch,

Type III – symmetrical “U” shaped notch with parallel margins, Type IV – a small “V” shaped notch, Type V – similar to type III with partially ossified ligament (medial part), Type VI- complete foramen due to completely ossified suprascapular ligament [5,6]. Obtained data is analyzed for statistical significance using ‘z’ test for proportions. Results were considered statistically significant when $p < 0.05$

RESULTS

In the present study all 6 types of suprascapular notches (Rengachary classification) were found – fig 1. But suprascapular notch was absent in 8(4.54%) of 176 scapulae. Most common type of SSN observed is type II – 61 (34.65%), both in right and left scapula which is statistically significant ($P < 0.05$). The least common type was type VI – 10 (5.68%), both in right and left scapula. Second common type is type I (17.61%) followed by type III (15.34%) and type V (14.2%). The incidence of partially ossified suprascapular ligament i.e. type V is significant with P value 0.005

Fig. 1: Showing the different types of scapular notch.



Table 1: Showing no. of right and left scapulae with different types of SSN.

Type of SSN	Left	Right	Total	%
Type I	16	15	31	17.61
Type II	37	24	61	34.65
Type III	15	12	27	15.34
Type IV	6	8	14	7.95
Type V	6	19	25	14.2
Type VI	5	5	10	5.68
Absent	3	5	8	4.54
Total	88	88	176	100

Table 2: Showing statistical test results of the obtained data. (*significant)

Type of SSN	side		Z	p-value
	Left	Right		
Type I	16(18.18)	15(17.04)	0.19	0.84
Type II	37(42.04)	24(27.27)	2.06	0.04*
Type III	15(17.04)	12(13.63)	0.63	0.53
Type IV	6(6.82)	8(9.09)	-0.56	0.57
Type V	6(6.82)	19(21.59)	-2.81	0.005*
Type VI	5(5.68)	5(5.68)	0	1
Absent	3(3.41)	5(5.68)	0.45	0.65

Fig. 2: Showing absent Supra Scapular Notch (SSN).



DISCUSSION

Several studies have been done to describe the morphology of SSN by various authors in different population [1,7,8]. Among six types of scapular notches found in the study most common type of SSN is Type II - 34.65%, which is significant with p value 0.04. The least common type is type VI (5.68%) which is quite high compared to other studied in the table. SSN was absent in 4.54% scapulae, this is higher than that reported in Kenyan population [7].

Table 3: Showing comparison of percentage of different SSN in various studies and present study.

Type of notch	Natsis et al 2007 [9] N=423	Sinkeet et al 2010 [7] N=138	Muralidhar et al 2013 [10] N=105	Present study N=176
I	8%	22%	21.15%	17.61%
II	31%	21%	8.65%	34.65%
III	48%	29%	59.61%	15.34%
IV	3%	5%	2.88%	7.95%
V	6%	18%	5.76%	14.20%
VI	4%	4%	1.93%	5.68%

The most striking feature in our study is number of partially ossified suprascapular ligament i.e. type V - 14.2% (which is significantly high with p value 0.005) compared to other studies as shown in the table below.

Table 4: Showing percentage of Type V SSN in different study and present studies.

Population	Sample size	Type V SSN
Finnish	200	1.50%
French	200	6.50%
North America	79	1.27%
Greek	400	0.75%
Kenyan	138	2.90%
Present study	176	14.20%

Suprascapular nerve entrapment is treated by conservative methods or surgical decompression of the nerve where it is entrapped [2]. An arthroscopic approach is a more sophisticated way of treating the condition but an important point of concern here is presence of completely (type VI) or partially ossified suprascapular ligament (type V SSN). The identification of the bony bridge is critically important, because in these cases apart from dissecting the ligament the bony bridge must also be excised during the procedure for better post-operative outcome. Moreover, the morphology of SSN is not only important while addressing nerve entrapment but also in avoiding an iatrogenic injury of the scapular nerve during arthroscopic Bankart procedures and other open procedures requiring dissection of the posterior glenoid neck [9,11].

CONCLUSION

To conclude, the thorough knowledge of variations in the morphology of SSN is an important issue while diagnosing and treating suprascapular nerve entrapment. The present study is an attempt to describe the different types of suprascapular notch with statistical significance.

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Conflicts of Interests: None

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