ORIGINAL RESEARCH

Morphological Study Of Ossified Supra-Scapular Ligament In Eastern U.P Of India

Sajjad Jafer[1], Ranjan kumar Dixit[2], Yogendra Pratap Maurya[3]

ABSTRACT

Introduction: The Scapula is a flat triangular bone its superior border is thin and shorter than other border it extends from the superior angle to the near the root of coracoid process. The supra-scapular notch is situated just adjacent to the base of the coracoid process. The supra-scapular ligament bridges the supra-scapular notch and converts it in to a foramen, which transmits the supra-scapular nerve and vessels lie above the ligament. The present study is a simple method to classify the shapes of the supra-scapular notch and causes of complete ossification of superior transverse scapular ligament in eastern UP of India .anatomical variations in the shape of supra-scapular notch and ossification of the supra-scapular ligament as one of the cause of the supra-scapular nerve entrapment. Aim of the study was to study was determining the morphological variations of supra-scapular notch and causes of ossification of the supra-scapular ligament and its clinical significance.

Material And Methods: 98 dry scapulae were collected from anatomy department BRD Medical College, Gorakhpur. The supra-scapular regions of all 98 scapulae were analyzed after obtaining permissions from the head of anatomy department for the study. The present photographs of different types of supra-scapular notch and along the ossified supra-scapular ligament of the scapulae were taken by using a digital camera. We followed the classification of supra-scapular notches was noted and recorded as per the description given by Rengachary et al. The results of the my study were compared with the results of previous research.

Result: In our study 2.04% were found to have complete ossification of supra-scapular ligament and 3.06% partial ossification of supra-scapular ligament .The measurement of the bony bridges which formed by the ossification of supra-scapular ligament are different in different scapula according to shape.

Conclusion: The morphological knowledge of the supra-scapular notch and ossification of the supra-scapular ligament helpful for surgeons and clinicians dealing with supra-scapular nerve entrapment conditions.

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Keywords: Dry human Scapula, ossification, supra-scapular ligament.

How to cite this article: Sajjad Jafer, Ranjan kumar Dixit, Yogendra Pratap Maurya. Morphological study of ossified supra-scapular ligament in eastern U.P of india. International Journal of Contemporary Medical Research 2015;2(3):643-646

Source of Support: Nil

Conflict of Interest: None

INTRODUCTION

The scapula is a triangular flat bone it is also called shoulder blade that lies on the postero-lateral surface of the thorax. It extends from the 2nd to 7th ribs.[1] The scapula has three borders, superior, medial and lateral. The superior border is thin and shorter than the other border it extends from the superior angle to the near the root of coracoid process. The supra-scapular notch is situated just adjacent to the base of the coracoid process.

The supra-scapular ligament bridges the supra-scapular notch and converts it in to a foramen, which transmits the supra-scapular nerve and vessels lie above the ligament.

The supra-scapular nerve receive fibers from C5 and C6 nerve root. The supra-scapular nerve motor innervation to the supraspinatous and infraspinatous muscles.[2] In addition to branches to the coracoac-romial and coracohumeral ligam- ent and also supply to the acromioclavicular and shoulder joint but it does not supply the skin.

The action of the supraspinatus steadies the head of humerus during movements of the arm and abductor of shoulder joints from 0-15 degree controversial and infraspinatus act as a lateral rotator of arm.[2]

The supra-scapular nerve entrapment is one of the cause of compression of nerve due to completely ossified supra-scapular ligament.[3-4] Thus entrap- ment of the supra-scapular nerve would result in weakness and loss of action of the infraspinatus and supraspinatus muscles due to progressive atrophy.[17]

In case of irritation of the nerve due to compression leading to diffused poserolateral pain in the shoulder and weakness of the shoulder region.[5-6] The study was

determining the variation of the shapes of the supra-scapular notch of dry human scapula and ossification of suprascpular nerve in eastern (Purvanchal) region of India, the shape of the supra-scapular notch may be responsible factor in supra-scapular nerve compression.

MATERIAL AND METHODS

98 dry scapulae were collected from anatomy department BRD Medical College, Gorakhpur. The supra-scapular regions of all 98 scapulae were analyzed after obtaining permissions from the head of anatomy department for the study.
The present photographs of different types of supra-scapular notch and along the ossified supra-scapular ligament of the scapulae were taken by using a digital camera. We followed the classification of supra-scapular notches was noted and recorded as per the description given by Rengachary et al. The results of the my study were compared with the results of previous research .

STATISTICAL ANALYSIS

Chi square test was applied as test of significance and p value <0.005 was considered a significant value.

RESULTS

In the present study out of 98 scapula, 2 scapula (2.04%) were found to have completely ossified and 3scapula (3.06%) has partial ossification of supra-scapular ligament. The measurement of the bony bridges which formed by the ossification of supra-scapular ligament are different in different scapula according to shape.
The morphological variations of supra-scapular notch is classified in to five groups-V, U(shallow), U(deep), J shaped and complete absence of notch. Many past research studies on the ossification of the suprascapular ligament described by authors in Table -2

DISCUSSION

According to Silva JF Complete ossified supra-scapular ligament frequently found in Brazilian population about 30.76%, Turkish 12.5% , in European population range 1.5% to 12.5%, American 6.5% and rare cases found in Asian population 4.08%. and Alaskan Eskims 0.3%. the past studies have reported a 3.7%-4% partial ossification (Rengachary SS,Burr D,Lucas S.1979) and 5% complete (T icker JB,Strauch RJ-1998) ossified supra-scapular ligament were found.
Ossified supra-scapular ligament varies one country to other country even one state to other state Etiology of such diversity not known. According to S.B. Cohen et al, it may be genetic cause because he described a familiar case in which father and his son suffered from supra-scapular nerve entrapment along with deep diffused pain, weakness and atrophy of the supraspinatous and infraspinatous muscles. Entrapment of the supra-scapular nerve at the supra-scapular notch was first described by Thompson and Kopell.

SNO	COUNTERY	CASES (%)
1	Finland	1.5%
2	Brazil	30.6(%)
3	Turkey	6.0-12.5%
4	France	5-6.5%
5	Italy	3.6-6.1%
6	Poland	4.72%
7	Germany	7.3%
8	Kenya	3%
9	China	4.08%
10	Egypt	13.6%
11	Africa	3%

Table -1: Data of Complete ossification of supra-scapular ligament in various countries

Serial no	Author	No of Ossified supra-scapular foramen		No of scapulae	Percentage		
		Complete	Partial		Complete	Partial	
1	Pragna	3		80	3.75%		
2	Kalpana	2		100	2%		
3	G Soni	3		100	3%		
3	Muralid	2		104	1.93%		
4	Vandana	17		134	12.6%		
5	Jadhave	37		350	10.57%		
6	Vyas	11		300	3.67%		
7	Present study	2	3	98	2.04%	3.06%	

Table-2: supra-scapular ligament study described by authors.

S.NO	Shape of supra-scapular notch	Percentage (%)
1	V Shape	9.21%
2	U-Shape(shallow)	21%
3	U-Shape(deep)	31.57%
4	J-Shape	17.10%
5	Complete absence	21%

Table-3: Types of scapular notches

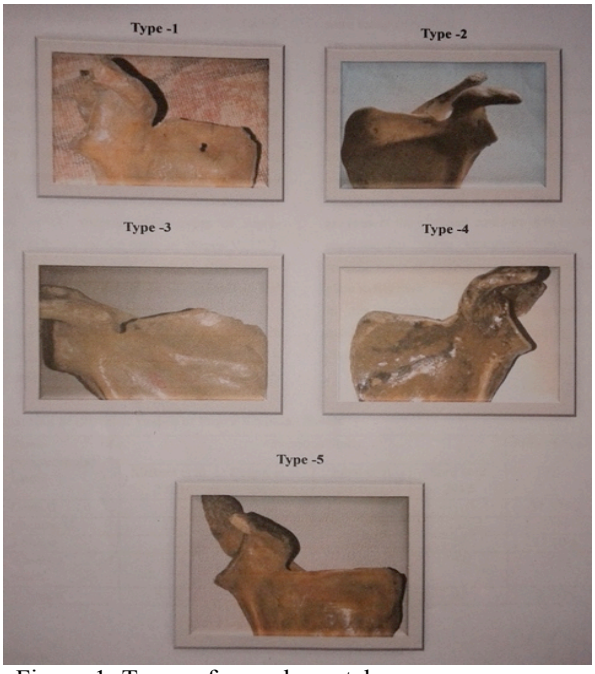

Figure-1: Types of scapular notches

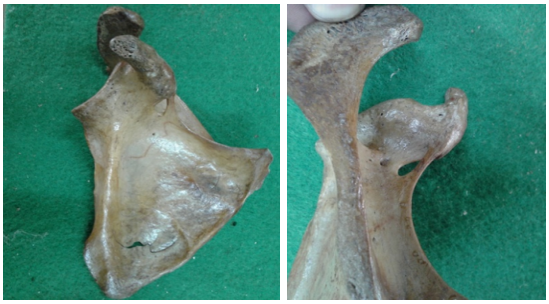

Figure-2: FigurePartial ossification (A,B)

Figure-3: Complete ossification (A,B)

According to Gosk et al the peripheral nerve are highly susceptible to injury from stretching and compression leading to entrapment of the supra-scapular nerve.

In our opinion the etiology of supra-scapular nerve entrapment is more complex and it depends on several factors

The supra-scapular nerve compression may be due to stretching of nerve in sporting activities like weightlifting , gymnastic , baseball pitching tennis .it also depends upon the habit and habitat .

Like repetitive overhead motion by tennis player and during the farming, digging by the farmer particularly in eastern U.P of India and trauma also responsible for the ossification of the ligament leading to supra-scapular nerve compression.

The morphological variations of supra-scapular notch are also one of the risk factors of the supra-scapular nerve entrapment. The classification of supra-scapular notches has been done by researchers. According to Bayramoglu et al, tuccar et al 2003, have been reported six different types of anatomical variation of supra-scapular notch in Nigerian population .Ticker et al classified supra-scapular notch on basis of morphological appearance as U and V shaped .Iqbal et al, reported three types of supra-scapular notch on the basis of their shapes, U,V, J.

In our study dry human scapula collected from department of anatomy BRD medical college Gorakhpur which is obtained by cadavers of eastern region of India. On the basis of anatomical variations of supra-scapular notch is classified in to five groups (Table-3).

Supra-scapular nerve entrapment is more susceptible to be associated with a narrow V shaped notch due to reduction in the height of the supra-scapular foramen may be one of the risk factors of the entrapment of the supra-scapular nerve. In our study 2.04% were found fan shaped in complete ossification and 3.06% band shaped in partial ossification of supra-scapular ligament.

CONCLUSION

The morphological knowledge of such anatomical variations of the supra-scapular notch and ossification of supra-scapular ligament may be helpful for clinicians, radiologist and surgeons for understanding of location and source of the entrapment of the supra-scapular nerve and making a proper diagnosis and for planning the suitable surgical innervations.

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