

**STUDY OF ANATOMICAL VARIATIONS IN THE SHAPE OF SUPRASCAPULAR NOTCH IN DRIED HUMAN SCAPULAE AND ITS CLINICAL SIGNIFICANCE**Udayasree L<sup>1</sup>, Siva Prasad G. V<sup>2</sup>, Lakshmi V. V. V<sup>3</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTRACT: AIM:** The suprascapular nerve arises from the upper trunk of brachial plexus, passes through the suprascapular notch and then through the spinoglenoid notch and supplies the supraspinatus and the infraspinatus muscles. Due to the presence of anatomical variations in the shape of the suprascapular notch, there may be compression of the suprascapular nerve which leads to suprascapular nerve entrapment syndrome. The present study is a simple method to classify the suprascapular notch of dried human scapulae and its clinical significance. **MATERIALS & METHOD:** 42 dried human scapulae of both sides were examined for variations in the shape of suprascapular notch. **RESULT:** Mainly three different shapes were observed. They are U, V & J. Some scapulae are having suprascapular foramen instead of notch and some are having absent suprascapular notch.

**KEYWORDS:** Suprascapular notch, suprascapular nerve, Scapula and Anatomical variations.

**MESHTERMS:** Scapula: A02.835.232.087.783

**INTRODUCTION:** The scapula is a flat bone of shoulder girdle that lies on the poster lateral aspect of the thorax. The lateral part of superior border of scapula contains suprascapular notch which is bridged by superior transverse scapular ligament converting into foramen. This foramen transmits suprascapular nerve to the supraspinous fossa.<sup>1</sup> It supplies motor branches to the supraspinatus, infraspinatus, and sensory branches to rotator cuff muscles and ligamentous structures of the shoulder and acromio-clavicular joints. Complete or partial ossification of superior transverse scapular ligament and anatomical variations in the shape of suprascapular notch leads to nerve compression during movements of shoulder. Suprascapular nerve entrapment is an uncommon cause for shoulder pain and weakness. It was initially described by Thompson and Kopell.<sup>2</sup>

Many authors proposed different classifications based on measurements and shapes of suprascapular notch. Iqbal et al<sup>3</sup> described three types of shapes of suprascapular notch- U, V & J. Natsis et al<sup>4</sup> classified the suprascapular notches based on vertical and horizontal diameters of the notch into 5 types. In the present study, we examined the anatomical variations of the shape of suprascapular notch of dried human scapulae which is useful for clinicians to correlate the type of notch causing suprascapular nerve entrapment syndrome.

**MATERIALS & METHODS:** The present study was conducted on 42 dried human scapulae of both sides from Department of Anatomy, NRIIMS, Sangivalasa and were examined for anatomical variations in the shape of suprascapular notch, absence of notch and partial or complete ossification of superior transverse scapular ligament.

**OBSERVATIONS:** In the present study which was done on scapulae of South Indian population, three different shapes of suprascapular notch were observed along with partial or complete ossification of

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superior transverse scapular ligament. Absence of suprascapular notch was also observed. Out of 42 scapulae, 20 scapulae had U-shaped suprascapular notch (Fig. 1), 9 scapulae had J-shaped suprascapular notch (Fig. 2) and 2 scapulae had V-shaped suprascapular notch (Fig. 3). Absence of notch was noted in 5 scapula (Fig. 4). 2scapulae had partial ossification of superior transverse scapular ligament (Fig. 5) and 4scapulae had complete ossification of superior transverse scapular ligament forming suprascapular foramen (Fig. 6). The number and the percentage of different shapes of suprascapular notch and ossification of superior transverse scapular ligament were shown in Table 1.

Shapes	Number & Percentage
U	20(47.6%)
J	9(21.4%)
V	2(4.7%)
Absence of Notch	5(11.9%)
Superior Transverse Scapular ligament	
Partial Ossification	2(4.7%)
Complete Ossification	4(9.5%)

**Table 1: Shapes of Suprascapular notch and Ossification of superior transverse scapular ligament**

**DISCUSSION:** The suprascapular notch being a fibro-osseous neural foramen, is the most common site of entrapment of the suprascapular nerve because of an abnormal configuration of the suprascapular notch, traction injury or a ganglion compressing the nerve.<sup>5, 6</sup>

In the present study, out of 42 scapulae, 20(47.6%) had U-shaped suprascapular notch with approximately parallel sides and a rounded base. 9(21.4%) scapulae had J-shaped notch with one side short and another side long. 2(4.7%) scapulae had V-shaped notch with convergence of two sides toward a narrow base. According to Iqbal et al,<sup>3</sup> U-shaped notches were 13.2%, V-shaped notches were 20%, J-shaped notches were 22% and 45out of 200 scapulae are without suprascapular notch in the population of Pakistan. In the present study, 5(11.9%) scapulae were not having suprascapular notch. No indentations at the site of notch were found. In a case report by Rekha,<sup>7</sup> occasional absence of suprascapular notch was observed.

In the present study, 2(4.7%) scapulae had partial ossification and 4(9.5%) had complete ossification of superior transverse scapular ligament. Complete ossification leads to the formation of suprascapular foramen. Iqbal etal<sup>3</sup> did not mention about the ossification of transverse scapular ligament and foramen. In the study done by Patel et al,<sup>8</sup> 3.75%scapulae showed suprascapular foramen due to complete ossification of transverse scapular ligament. According to the study of Kannan et al,<sup>9</sup> 4% of scapulae had partial and 10% of scapulae had complete ossification of transverse scapular ligament. Most common radiological finding in suprascapular nerve entrapment syndrome is shallowness and deformity of the suprascapular notch.<sup>10</sup>

In the present study, coexistence of suprascapular foramen and suprascapular notch was not observed. In the study done by Natsis et al<sup>11</sup> and in a report by Saritha,<sup>12</sup> occasional coexistence of suprascapular notch and suprascapular foramen were observed due to the complete ossification of anterior coracoscapular ligament. Natsis etal<sup>11</sup> did his study in the population of Greece. According to

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the study done by Vasudha et al<sup>13</sup> in Indian population, symmetrical U- shaped suprascapular notch was the most common anatomical variation (34.78%) and coexistence of suprascapular notch and suprascapular foramen was least common (0.88%). In the present study also U – shaped notch was most common (47.6%). The narrow V- shaped notch, absence of notch and also the ossification of the superior transverse scapular ligament were commonly associated with suprascapular nerve entrapment syndrome.

**CONCLUSION:** Knowledge of anatomical variations of suprascapular notch is useful for clinicians for better correlation and early diagnosis of suprascapular nerve entrapment syndrome. Shallow and absence of suprascapular notch and partial or complete ossification of transverse scapular ligament may predispose to entrapment of suprascapular nerve.

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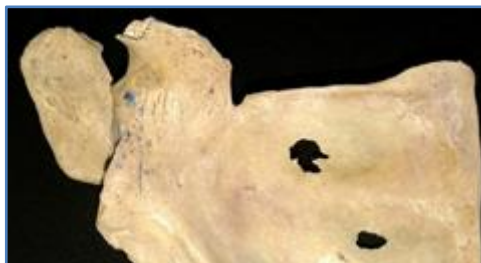
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**Fig. 1: Showing U-shaped Suprascapular Notch**



**Fig. 2: Showing J-shaped Suprascapular Notch**



**Fig. 3: Showing V-shaped Suprascapular Notch**

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**Fig. 4: Showing Absence of Suprascapular Notch**



**Fig. 5: Showing Partial Ossification of Superior transverse scapular ligament**



**Fig. 6: Showing Complete Ossification of Superior transverse scapular ligament**

### **AUTHORS:**

1. Udayasree L.
2. Siva Prasad G. V.
3. Lakshmi V. V. V.

### **PARTICULARS OF CONTRIBUTORS:**

1. Assistant Professor, Department of Anatomy, NRIIMS, Sangivalasa, Visakhapatnam.
2. Associate Professor, Department of Anatomy, NRIIMS, Sangivalasa, Visakhapatnam.
3. Assistant Professor, Department of Anatomy, NRIIMS, Sangivalasa, Visakhapatnam.

### **NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:**

Udayasree L,  
D. No. 16-3-5/8,  
A2 - Dayal Apartments,  
Official Colony, 1<sup>st</sup> Line,  
Maharanipeta, Visakhapatnam - 530002.  
Email: thesensitiveramesh@gmail.com

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