International Journal of Medical Science in Clinical Research and Review
Online ISSN: 2581-8945
Available Online at http://www.ijmscrr.in Volume 6|Issue 06 (November-December)|2023 Page: 1152-1155

Original Research Paper

Morphology and Morphometry of Suprascapular Notch and its Importance in Suprascapular Entrapment Neuropathy

Authors:
Doni. R. Praveen Kumar[1], Ravi Kumar Urjana[2]
[1]*Assistant Professor, Department of Anatomy, Annaii Medical College (Rajalakshmi Health City), Chennai*
[2]*Assistant Professor, Department of Anatomy, Great Eastern Medical School & Hospital, Srikakulam*
Corresponding Author:
Dr. Doni. R. Praveen Kumar
Assistant Professor, Department of Anatomy, Annaii Medical College (Rajalakshmi Health City)

Article Received: 05-November-2023, Revised: 25-November-2023, Accepted: 15-December-2023

ABSTRACT:
Aim: Aim of this study is to know the morphology of SSN and Morphometry of SSN. **Introduction**: Scapula (Shoulder blade) is a Thick, flat, Triangular bone. Located on the upper part of the posterolateral aspect of the thorax, against the second to seventh ribs. It is the bone that connects the humerus with the clavicle. The superior border of scapula is shortest and is separated from the root of the coracoid process by the suprascapular notch. **Materials and Methods**: This study was done in 170 dry scapulae. 90- right and 80– left. Shape of suprascapular notch and measurements of notches were taken by using a vernier caliper. **Results**: In this study the most common type of supra scapular notch is Type -III was observed Based on Rengachary classification. And the Most common type of Shape of suprascapular notch is 'J' Shape. **Conclusion**: Knowledge about Morphology and Morphometry about Suprascapular notch is more useful to treat suprascapular entrapment neuropathy.

Keywords: ***Suprascapular Notch, Rengachary Classification, Suprascapular Entrapment Neuropathy***

INTRODUCTION:

Scapula (Shoulder blade) is a Thick, flat, Triangular bone. Located on the upper part of the posterolateral aspect of the thorax, against the second to seventh ribs. It is the bone that connects the humerus with the clavicle. It forms back of the shoulder girdle. It has dorsal and costal surfaces and spinous, Acromion, and coracoid processes. It has medial, lateral, and superior borders. The superior border is the shortest and is separated from the root of the coracoid process by the suprascapular notch. This notch is traversed by the superior transverse ligament it gets attached to the root of the coracoid process. Now it turns into a foramen and it transmits suprascapular nerve and vessels, Suprascapular vessels pass above the ligament. Nerve supplies to the supraspinatus and infraspinatus muscles, also an articular twig supplies to the capsule of the shoulder joint. Knowing about the course, and anatomical variations of the suprascapular nerve is important to understand suprascapular entrapment neuropathy.

The Suprascapular nerve is liable to compression when crossing the osteofibrous canal at the suprascapular notch. Anatomical variations of the suprascapular nerves are a possible cause of Suprascapular nerve entrapment, especially in volleyball players and baseball pitchers. While the aberrant course of the suprascapular artery through the suprascapular notch can lead to suprascapular nerve compression [1].

MATERIALS AND METHODS:

This study was done in 170 dry scapulae. 90- right and 80– left Obtained from the anatomy department of different medical colleges in Andhra Pradesh. adult human scapulae of unknown sex belonging to an Indian population. Only bones that were intact and free from any pathological or congenital anomalies were used. Anatomic measurements are accurate to 0.1 mm and were taken using a vernier caliper. Later following parameters were noticed such as the presence or absence of the suprascapular notch and the shape of the notch. Simultaneously Morphometric parameters such as Transverse diameter and Vertical diameter and Distance between SNN to supraglenoid tubercle were noted by using a digital Vernier caliper. The transverse diameter of the suprascapular notch is the distance between one end of the notch and to other ends. Whereas Vertical diameter is measured by the deepest point of the notch to the midpoint on the imaginary plane between the ends of the suprascapular notch. Along with Distance between

suprascapular notch to supraglenoid tubercle were measured.

Suprascapular notches were classified into five groups based on their shape.

Nasis K et al. classified the SSN into five different types [2]

Type I: No discrete Suprascapular notch

Type II: Transverse diameter greater than Vertical diameter

Type III: Vertical diameter is greater than Transverse diameter

Type IV: Completely formed bony suprascapular foramen.

Type V: With a Notch and Bony Foramen

Rengachary et al classified Suprascapular notches into six types based on the depth and width and widest point within the notch [3].

RESULTS:

Table 1: Showing the distribution of various shapes of suprascapular notch based on Rengachary classification.

Classification	Right	Left	Percentage n (%)
Type – I	13.3	12.5	12.9
Type – II	17.7	17.5	17.6
Type – III	40	47.5	43.5
Type – IV	15.5	10	13.1
Type – V (Medial Part of Ligament Ossified)	4.4	5	4.7
Type – V (Completely ossified Ligament)	8.8	7.5	8.2
Total			100

Table 1 Shows that classification of suprascapular notch based on Rengachary classification, in this study the most common type of Suprascapular notch is Type III and the least common type is Type – V (Medial part of ligament is ossified).

Table 2: Classification of Suprascapular notch based on shape

S. No	Type of shape	Right (%)	Left (%)	Total (%)
1	U	20.0	23.7	21.7
2	J	48.8	41.2	45.2
3	V	13.3	7.5	10.5
4	Indentation	6.6	11.2	8.8
5	Absence of Notch	5.5	5.0	5.2
6	Partial ossification	2.3	7.5	4.7
7	Complete ossification	3.3	3.7	3.5
8	**Total**			100

Table 2 Shows that different types of shape of suprascapular notch among of this the most common shape is J shape and the least type is complete ossification.

Table 3: Morphometric Analysis of Suprascapular Notch

S NO	Parameter	Mean ±SD (mm)		P Value
		Right	Left	
1	Vertical Length (VL)	9.72 (±2.75)	8.87 (±1.71)	0.01
2	Transverse Diameter (TD)	10.33 (±2.40)	9.62 (±1.29)	0.01
3	Distance from base of SSN to Supraglenoid tubercle	44.93 (± 2.95)	43.96 (± 2.81)	0.03

Table 3 Shows the Morphometric analysis of the suprascapular notch which includes Vertical diameter, Transverse diameter and distance between suprascapular notch to Supraglenoid tubercle [6]. Mean and SD values of all three parameters were obtained and P value of all three parameters are statistically significant.

DISCUSSION:

In this study we observed that Type III (Rengachary classification) [4],[5] as a most common type and Type V (Medial part of ligament is ossified) is least type of Supra scapular notch. Same study done in different populations by different authors, Rengachary et al did in American population in his study the major type is Type III of suprascapular notch and the least type of Supra scapular notch is Type VI.

Sinkeet et al did his study in Kenyan population, reported that major type of supra scapular notch is Type III and the least common type is Type VI. And Muralidhar reported that major type of supra scapular notch is Type III.

Table 4: Comparison of types of suprascapular notch in the present study with previous studies.

Type of Suprascapular notch	Rengachary et al (America)	Sinkeet et al (Kenya)	Muralidhar et al (India)	Present study (India)
Type -I	6	22	21.15	12.9
Type – II	24	21	8.65	17.6
Type – III	40	29	59.61	43.5
Type -IV	13	5	2.88	13.1
Type - V	11	18	5.76	4.7
Type - VI	6	4	1.93	8.2

Table 5: Comparison of shapes of suprascapular notch in present study with previous studies

Shapes of Suprascapular notch	Soni G Et al	Iqbal et al	Vasudha TK Et al	Present study
U	58	13.2	6.08	21.7
J	7	20	-	45.2
V	27	22	19.13	10.5
Indented	3	33.5	7.82	8.8
Absence of Notch	2	22.5	6.08	5.2
Ossified Partially	14	-	6	4.7
Ossified Completely	-	-	-	3.5

Similarly Various studies reported about Shape of Supra scapular notch, Soni G et al reported 'U' Shape Supra scapular notch is More common than other. Iqbal et al [12] reported that Indented shape of supra scapular notch is more common than other types.

In this study we observed that 'J' Shaped supra scapular notches are more common than other types[9]. Simultaneously we observed vertical and transverse diameters of supra scapular notch and distance between supra scapular notch to supraglenoid tubercle.

According to Soni et al reported that 72% percent scapulae transverse diameter is greater than vertical diameter and 20% scapulae vertical diameter is greater than transverse diameter. According to Apurba patra et al study he reported 67.34% scapulae transverse diameter is greater than vertical diameter and 14.28% vertical diameter was more than transverse diameter.

This parameter of notch defines the size of the suprascapular notch, a small size of the suprascapular notch is more prone to cause suprascapular nerve entrapment than large size supra scapular notches.

The scapula bone is ossified by a cartilaginous model with the help of eight ossification centers[7]. One center for the Body and two centers for the coracoid process and two centers for the acromion process, one center for the Medial border and one center for the inferior angle, and one for the inferior part of the glenoid cavity [9].

CONCLUSION:

Knowledge about morphology and morphometry of suprascapular notch is helpful in finding the site of nerve compression, which can lead to suprascapular nerve entrapment syndrome. Knowledge of these variations are useful during surgical procedures [8]and to minimize the risk of iatrogenic injury of the suprascapular nerve during arthroscopic procedures.

Conflicts of Interests: None

REFERENCES:

1. Standring S. Gray's Anatomy, 40th Ed, Elsevier Churchill Livingstone, London,2008; P: 793-96.
2. Natsis K, Totlis T, Tsikaras P, Appell HJ, Skandalakis P, Koebke J. Proposal for classification of the SSN: A study on 423 dried scapulas. Clinical Anatomy. 2007; 20:135-39.
3. Rengachary SS, Burr D, Lucas S, Hassanein KM, Mohn MP, Matzke H. Suprascapular entrapment neuropathy: a clinical, anatomical, and comparative study. Part 1: Clinical study. Neurosurgery. 1979;5(4):441-46
4. Rengachary SS, Burr D, Lucas S, Hassanein KM, Mohn MP, Matzke H. Suprascapular entrapment neuropathy: a clinical, anatomical, and comparative. Study Part 2: anatomical study. Neurosurgery. 1979;5(4):447-51.
5. Rengachary SS, Burr D, Lucas S, Brackett CE. Suprascapular entrapment neuropathy: A clinical, anatomical, and comparative study. Part 3. Neurosurgery.1979;5(4):452-55.
6. Sangam MR, Sarada Devi SS, Krupadanam K, Anasuya K. A study on the morphology of the suprascapular notch and its distance from the glenoid cavity. J Clinic Diagn Res. 2013;7(2):189-92.
7. Cummins CA, Anderson K, Bown M, Nuber G, Roth SI. Anatomy and histological characteristics of the spinoglenoid ligament. J Bone Joint Surg Am. 1998; 80:1622-1625
8. Bayramoglu A, Demiryurek D, Tuccar E, Erbil M, Aldur MM, Tetik O, Doral MN. Variations in anatomy at the suprascapular notch possibly causing suprascapular nerve entrapment: An anatomical study. Knee Surg Sports Traumatol Arthroscopy, 2003; 11: 393-8.
9. Sinkeet SR, Awori KO, Odula PO, Ogeng'o JA, Mwachaka PM. The suprascapular notch: its morphology and distance from the glenoid cavity in a Kenyan population; Folia Morphol, 2010; 69(4):241- 45.
10. Sutaria LK. Morphology and morphometric analysis of suprascapular notch. IJBAR. 2013;4(1):35-39. [20] Kumar A, Sharma A, Singh P.
11. Iqbal K, Iqubal R. Anatomical variations of the suprascapular notch in scapula. J Morphol Sci. 2010:27(1):01-02.
12. Agrawal D, Singh B, Agrawal GA. Human scapulae; Suprascapular notch, morphometry, and variations. Indian Jour Clin Anat & Physio. 2014;1(1):01-07.
13. Patel P, Patel SV, Patel SM, Badal J, Chavda S, Patel D. Study of variations in the shape of the suprascapular notch in Dried Human Scapula. Int J Biol Med Res. 2013;4(2):3162–64.
14. Sutaria LK. Morphology and morphometric analysis of suprascapular notch. IJBAR. 2013;4(1):35-39