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MORPHOLOGICAL VARIATIONS OF THE HUMAN SUPRASCAPULAR NOTCH AND ITS SURGICAL IMPLICATIONS

Anatomy

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ABSTRACT

Introduction: The suprascapular notch (SSN) is a small notch located on the superior border of the scapula, close to the root of the coracoid process. It serves as a passageway for the suprascapular nerve and artery, which supply the supraspinatus and infraspinatus muscles. Variations in the morphology of the SSN have been associated with suprascapular nerve entrapment neuropathy (SEN), a condition characterized by pain, weakness, and paresthesias in the shoulder and upper arm. **Material and Methods:** The study was conducted on 206 dried human scapulae, from the collections in the Department of Anatomy, Ram Krishna Medical College Hospital and Research Centre, Bhopal, MP. **Results:** Type I: This is the most common type, accounting for approximately 40% of cases. Type II: 30% of cases, Type III: 15% of cases, Type IV: 5% of cases. Type V: less than 1% of cases, Type VI: accounting for less than 1% of cases.

KEYWORDS

Scapulae, Bone, Suprascapular, Notch

INTRODUCTION

The suprascapular notch is a small, U-shaped opening located on the superior border of the scapula, just medial to the coracoid process. It serves as a passage for the suprascapular nerve, which supplies the supraspinatus and infraspinatus muscles, and the suprascapular artery and vein. Variations in the morphology of the suprascapular notch are relatively common, and some of these variations can have surgical implications. The most common type of suprascapular notch variation is a complete ossification of the superior transverse scapular ligament (STSL). This ligament normally forms a bridge over the suprascapular notch, but in some cases, it can completely ossify, forming a bony roof over the notch. This ossification can narrow the notch and compress the suprascapular nerve, leading to suprascapular nerve entrapment syndrome.

Other types of suprascapular notch variations include:

- Bifurcation or trifurcation of the STSL: This occurs when the STSL divides into two or three branches, creating additional openings for the suprascapular nerve and vessels.
- Hypertrophy of the STSL: This occurs when the STSL thickens, which can also narrow the suprascapular notch.
- Shape variations: The suprascapular notch can also vary in shape, from a U-shape to a V-shape or even a W-shape.

Surgical Implications: Suprascapular nerve entrapment syndrome can cause pain, weakness, and atrophy of the supraspinatus and infraspinatus muscles. In severe cases, it can lead to rotator cuff tears. If the symptoms of suprascapular nerve entrapment syndrome are not relieved by conservative treatment, such as physical therapy, surgery may be necessary. In some cases, surgery may also be necessary to treat other conditions that involve the suprascapular notch, such as ganglion cysts or tumors. Several different surgical techniques can be used to treat suprascapular nerve entrapment syndrome. The most common technique is decompression of the suprascapular notch, which involves removing a portion of the STSL to widen the notch and relieve pressure on the nerve.

Other surgical techniques include:

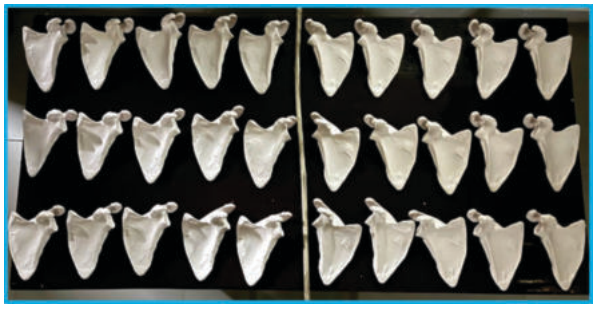
- Neurolysis: This involves releasing scar tissue or other adhesions that are compressing the nerve.
- Transposition of the suprascapular nerve: This involves moving the nerve to a new location where it is less likely to be compressed.

MATERIAL METHODS:

A total number of 206 (100 Rt. and 106 Lt.) dried human scapulae irrespective of the sex were used for the study. The scapulae used in the study were obtained from the collections in the Department of Anatomy, Ram Krishna Medical College Hospital and Research Centre, Bhopal, Madhya Pradesh. The study was conducted over a period of 7months. The morphological variations of the suprascapular notch were studied in the following method; the right and left side scapulae were grouped separately; the scapulae were studied for the presence or absence of suprascapular notch and suprascapular foramen. The scapulae with the absence of the suprascapular notch were grouped as having Type-I suprascapular notch. The scapulae with the presence of the suprascapular notch were observed by gross examination for the shape of the notch (V- shaped or U- shaped) and were named accordingly as Type II and Type III suprascapular notch. The scapulae with suprascapular foramen are again grouped into those having incomplete suprascapular foramen, named as, Type-V suprascapular notch and those having complete suprascapular foramen, Type-VI suprascapular notch.

Statistical Analysis:

Descriptive statistics like mean and percentages were used for the analysis in the present study using Microsoft office 2010



RESULTS:

Type I: U-shaped notch with a complete ossified superior transverse scapular ligament (STSL). This is the most common type, accounting for approximately 40% of cases.
Type II: U-shaped notch with an incomplete ossified STSL. This type accounts for approximately 30% of cases.
Type III: V-shaped notch with a complete ossified STSL. This type accounts for approximately 15% of cases.
Type IV: V-shaped notch with an incomplete ossified STSL. This type accounts for approximately 5% of cases.
Type V: Absent suprascapular notch. This type is rare, accounting for less than 1% of cases.
Type VI: Complete ossification of the suprascapular notch, resulting in the formation of a suprascapular foramen. This type is also rare, accounting for less than 1% of cases.

CONCLUSION:

Morphological variations of the suprascapular notch are relatively common, and some of these variations can have surgical implications. If you are experiencing symptoms of suprascapular nerve entrapment syndrome, it is important to see a doctor to discuss your treatment options.

DISCUSSION:

Author	Type III (U-Shaped Notch)	Type II (V-Shaped Notch)	Type I (Absent Notch)	Type V (Incomplete Suprascapular Notch)	Type VI (Complete Suprascapular Notch)	Type IV (Very Small Notch)
Present Study(2023)	45.9 %	42%	7%	4%	3%	2%
Reddy et all (2017)	44.3%	41.5%	6.6%	4.7%	2.8%	
Manmeet Kour et all1 (2016)	46.6%	8.3%	13.3%		3.2%	
Manikum et al10 (2015)	5%	65%	5%	7%		18%
Mahdy et al7 (2013)	76%	13%				
Ticker et al (2012)	77%	23%				
Rengachary et al (1979)	48%	31%	8%	6%	4%	3%

Surgical Implications:

Variations in the morphology of the suprascapular notch can have important implications for surgical procedures involving the shoulder region. For instance, in cases of suprascapular nerve entrapment neuropathy (SEN), the surgeon may need to modify the surgical approach to avoid damaging the suprascapular nerve, which is more susceptible to compression in individuals with a narrow or bridged notch.

Additional Considerations

In addition to the morphological variations mentioned above, other factors that can contribute to SEN include:

- **Repetitive shoulder movements:** Repetitive overhead activities can irritate and inflame the suprascapular nerve.
- **Trauma:** Direct trauma to the shoulder, such as a fracture or dislocation, can damage the suprascapular nerve.
- **Other conditions:** Conditions such as arthritis, tumors, or cysts in the shoulder region can also compress the suprascapular nerve.

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