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THE INCIDENCE OF OSSIFIED SUPERIOR TRANSVERSE SCAPULAR LIGAMENT (STSL) IN TAMIL NADU POPULATION OF INDIA

A. Perumal¹, Ravichandran D.²¹Department of Anatomy, Vinayaka Missions Kirupananda Variyar Medical College, Sankari Road, NH - 47, Seeragapadi, Salem, Tamilnadu, India²Department of Anatomy, Narayana Medical College, Nellore, Andhra Pradesh, India

E-mail of Corresponding Author: perumal_sas@yahoo.com

ABSTRACT

Background: Suprascapular neuropathy is due to suprascapular nerve entrapment in the suprascapular foramen and it is one of the causes for chronic shoulder pain and dysfunction. The suprascapular notch in the superior border of the scapula is usually bridged by the Superior Transverse Scapular Ligament (STSL). Sometimes the ligament gets ossified and compresses the suprascapular nerve passing deep to it producing the characteristic symptoms of compression neuropathy. The incidence of the ossified STSL varies in different ethnic populations. This study attempts to delineate the incidence of ossified STSL in Tamil Nadu population of India. **Materials and Methods:** Two hundred and thirty seven (237) dry human scapulae were studied. The presence of ossified STSL noted by macroscopic examination with naked eye. Results were tabulated and statistical analysis done.

Results: 9.7% of bones show complete ossification of STSL and 10.9% of bones showed partial or incomplete ossification of STSL. **Conclusion:** The knowledge of incidence of ossified STSL is essential for surgeons performing surgical decompression of the entrapped supra scapular nerve. This paper adds to the morphological data of the Tamil Nadu population, which would be of use to the Orthopedic surgeons working in this area.

Keywords: Scapula, superior transverse scapular ligament, entrapment, decompression, incidence.

INTRODUCTION

The superior border of the scapula in its lateral aspect presents a notch, called the Suprascapular Notch (SN). The notch is converted into a foramen by the Superior Transverse Scapular Ligament (STSL) which bridges the edges of the notch. The Suprascapular Nerve (SSN) passes deep to the ligament whereas the suprascapular vessels pass superior to the ligament. The SSN gives motor innervations to the supraspinatus and infraspinatus muscles and sensory innervations to the rotator cuff muscles and to the shoulder and acromioclavicular joint. Suprascapular nerve neuropathy is a common

cause of chronic shoulder pain and dysfunction¹. The suprascapular notch is one of the potential site for compression of the nerve. The condition was first described by Thomas² in the year 1936. Other etiologies associated with SSN neuropathy include direct trauma, rotator cuff tear, ganglion cysts causing compression, sports injury due to repeated traction, variation of the SN morphology^{1,3}. Apart from these, the ossification of the STSL has also been attributed to be one of the most important cause of SSN compression^{4,5,6,7}. The knowledge of this clinical condition is essential for the orthopaedic surgeons operating in this area. There is a paucity of information

regarding the incidence of ossified STSL in the literature. The present study aims to estimate the incidence of ossified superior transverse scapular ligament in Tamil Nadu population of India.

MATERIALS AND METHODS

Data for this study are comprised of 237 dry scapulae (Right - 107 and Left - 130) irrespective of sex and age belonging to Tamil Nadu population. The collection was obtained from the bone bank of Anatomy department, VMKV medical college, Salem, India.

As criteria of inclusion, none of the scapulae presented fractures, malformations, damage due to conservation or pathologies that could influence the development of the studied region. Each of the scapulae were examined macroscopically for the presence of ossified superior transverse ligament (complete or partial). The results were tabulated and analyzed statistically.

RESULTS

The results are presented in Table 1. Complete ossification of the superior transverse scapular ligament (Fig. 1) was observed in 9.7 % of bones (23 bones out of 237). Incomplete or partial ossification of the superior transverse scapular ligament (Fig. 2) was observed in 10.9% of bones (26 bones out of 237).

DISCUSSION

The role of suprascapular nerve entrapment in chronic shoulder pain and dysfunction is well appreciated by Orthopedic surgeons. The morphology of the bony notch altered due to ossification of STSL has been one of the significant causes for entrapment⁸. The incidence of ossified STSL has been reported as 1.5% in Finnish population⁹, 6.5% in Italian population¹⁰, 30.76% in Brazilian population¹¹ and as 10.57% in Indian population¹². Our study results closely coincide with the results of the other Indian study (Table II).

The STSL experiences both compressive and tensile forces. This is indicated by the presence of fibro cartilage entheses¹³ in the ligament. The incidence of ossification has been noted to increase with age¹⁴. This finding indicates that the compressive and tensile forces play a role in the ossification. Research also confirms that the STSL may be calcified partially or ossified completely^{4,5}. Silva¹¹ has proposed that the pull of muscles and certain habits of life at utilization of the upper limbs are the probable causes of high incidence of calcification in the studied population. Familial cause for calcification has also been described¹⁵. Patients presenting with chronic shoulder pain, dysfunction and wasting of the muscles innervated by suprascapular nerve require surgical decompression of the same. The surgical technique includes direct exploration or arthroscopic release. Arthroscopic release of the STSL is the current trend in the surgical treatment of the suprascapular nerve entrapment neuropathy. The technique of arthroscopic release has been found better when compared to the routine or traditional open release technique¹⁶. In arthroscopic release the neurovascular structures and STSL are better visualized and also the procedure is simple and less invasive when compared to direct exploration¹⁶. Variation in the STSL as in case of its ossification, the surgical procedure becomes more difficult and risky. Injury to the suprascapular vessels and nerve are the potential risk factors in case of ossified STSL. The choice of instruments (arthroscopic burr VS Kerrison punch) is also to be decided pre-operatively in decompressing the suprascapular nerve entrapped due to ossified STSL^{1,16}. The present study revealed an incidence of 9.7% and 10.9 % of complete and incomplete ossification of STSL respectively. The present study adds to the pre existing data on ossified STSL in Tamil Nadu population and may be useful to the orthopedic surgeons operating in this area.

CONCLUSION

Based on the present study, it can be inferred that the compressive and tensile forces play a role in either partial or complete ossification of STSL. The knowledge of incidence of ossified STSL is essential for surgeons performing surgical decompression of the entrapped suprascapular nerve. The authors recommend cross-sectional studies with large sample size taking into account additional parameters like the age and gender of the bones in future.

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FIGURES



Figure: 1. Scapula showing completely ossified superior transverse scapular ligament (Anterior view)



Figure: 2. Scapula showing partially ossified superior transverse scapular ligament (Anterior view)



Figure: 3. Scapula showing completely ossified superior transverse scapular ligament (Posterior view)



Figure: 4. Scapula showing partially ossified superior transverse scapular ligament (Posterior view)



Figure: 5. Normal scapula (No ossified ligament Anterior view)

Table – 1 Ossified superior transverse scapular ligament (n=237)

S.No.	Ossified superior transverse scapular ligament	Right	Left	Total
1	Complete ossified superior transverse scapular ligament	11 (47.82%)	12(52.17%)	23 (9.70%)
2	Partially Ossified superior transverse scapular ligament	7 (26.92%)	19(73.07%)	26 (10.97%)

Table -2 Comparison of incidence of Ossified superior transverse scapular ligament with other studies

S.No	Author	Incidence of Ossified superior transverse scapular ligament
1	Kajava et al	1.5%
2	Vallois et al	6.5 %
3	Silva et al	30.76%
4	Jadav et al	10.57%
5	Present study	Complete ossification in 9.7% Incomplete ossification in 10.97%