A Study on Morphology of Suprascapular Notch with Specific Emphasis on Completely Ossified Superior Transverse Scapular Ligament

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Abstract

Background and Aim The superior border of scapula is marked by suprascapular notch which is bridged by suprascapular ligament. Beneath this ligament, passes the suprascapular nerve. Narrow notch and completely ossified superior transverse scapular ligament is one of the risk factors for suprascapular nerve entrapment. This study is done to study morphological variation of suprascapular notch. Knowledge of various types of suprascapular notch will help the clinician in early diagnosis and surgical treatment.

Materials and Methods A total of 525 human scapulae of unknown age and sex were studied for morphology of suprascapular notch at the Department of Anatomy, GMERS medical college, Vadnagar and at B. J. Medical College, Ahmedabad. Photographs of various types of suprascapular notch were taken using digital camera and classified as per the Rengachary classification.

Result In the present study, as per Rengachary classification, out of 525 scapulae, the most common is Type III (47.1%), least common is Type V (1.9%), and completely ossified superior transverse scapular ligament is Type VI (8.9%).

Conclusion Knowledge of various types of suprascapular notch will help the physician in screening high-risk patients as well as diagnosis and treatment of suprascapular nerve entrapment disorder.

Introduction

The superior border of scapula is marked near the junction of its medial two third and lateral third by the suprascapular notch, where the superior border joins the base of coracoid process.¹ The suprascapular nerve arises from the upper trunk of brachial plexus (C5, C6) in the posterior triangle of the neck. It runs beneath the suprascapular ligament which bridges the suprascapular notch. It supplies the supraspinatus and infraspinatus muscle as well as shoulder and acromioclavicular joint.² Rengachary described that the suprascapular nerve irritation and compression leads to suprascapular neuropathy during its passage through suprascapular foramen.³ Suprascapular nerve entrapment causes pain, weakness, and atrophy of the muscles and joint it supplied.⁴

The aim is to study morphological variations of suprascapular notch in dry human scapula and incidence of complete ossification of superior transverse scapular ligament which is the risk factor for suprascapular nerve entrapment.

Materials and Methods

A total of 525 human scapulae of unknown age and sex were studied at the Department after taking permission from the head of institute and department. The scapulae with damaged superior border or suprascapular notch were excluded from the study. The study was carried out from February 2017 to March

ISSN 2277-4025.
In the present study, the most common type of suprascapular notch is Type III (47.1%), which is in accordance with the study done by Rengachary et al, Sinkeet et al, Muralidhar et al, and Kannan et al (Table 3). The least common type of suprascapular notch is Type V (1.9%), which is in accordance with the study done by Kannan et al.

In the present study, incidence of complete ossification of superior transverse scapular ligament is Type VI (8.9%), which is in accordance with the study done by Kannan et al. In the present study, the most common type of suprascapular notch is Type III (47.1%), which is in accordance with the study done by Rengachary et al, Sinkeet et al, Muralidhar et al, and Kannan et al (Table 3).

In the present study, incidence of complete ossification of superior transverse scapular ligament is Type VI (8.9%), which is in accordance with the study done by Kannan et al.

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In the present study, incidence of complete ossification of superior transverse scapular ligament is Type VI (8.9%), which is in accordance with the study done by Kannan et al.
The incidence of complete ossification of superior transverse scapular ligament in different population is relatively significant in comparison to other ethnic population. The incidence is more in Turkish (ranging from 6–12.5%), followed by Indian (ranging from 3–10%), French (ranging from 5–6.5%), and American (ranging from 1–4%) (Table 4).

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Percentage of completely ossified superior transverse scapular ligament</th>
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<tbody>
<tr>
<td>Vallois, 192514</td>
<td>French</td>
<td>6.5%</td>
</tr>
<tr>
<td>Olivier, 196014</td>
<td>French</td>
<td>5–6.5%</td>
</tr>
<tr>
<td>Rengachary et al, 19799</td>
<td>American</td>
<td>4%</td>
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<tr>
<td>Edelson, 199515</td>
<td>American</td>
<td>3.7%</td>
</tr>
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<td>Ticker et al, 199816</td>
<td>American</td>
<td>1.27%</td>
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<tr>
<td>Bayramoğlu et al, 200317</td>
<td>Turkish</td>
<td>12.5%</td>
</tr>
<tr>
<td>Urgüden et al, 200418</td>
<td>Turkish</td>
<td>6%</td>
</tr>
<tr>
<td>Natsis et al, 20079</td>
<td>Greek</td>
<td>6%</td>
</tr>
<tr>
<td>Sinkeet et al, 20107</td>
<td>Kenyan</td>
<td>4%</td>
</tr>
<tr>
<td>Wang et al, 201110</td>
<td>Chinese</td>
<td>1.36%</td>
</tr>
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<td>Polgj et al, 201121</td>
<td>Poland</td>
<td>7%</td>
</tr>
<tr>
<td>G. Soni et al, 201222</td>
<td>Indian</td>
<td>3%</td>
</tr>
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<td>Albino et al, 201311</td>
<td>Italian</td>
<td>3.6%</td>
</tr>
<tr>
<td>Tubbs et al, 201313</td>
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<td>Sangam et al, 20134</td>
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<td>Kannan et al, 20149</td>
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<td>10%</td>
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<td>Pushpa and Bajpe, 201512</td>
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<td>5.68%</td>
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<td>Sharma et al, 201514</td>
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<td>5%</td>
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<td>Chhabra et al, 201615</td>
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<td>Vedha and Vidhulata, 201710</td>
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<td>9.2%</td>
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<tr>
<td>Desai et al, 201820</td>
<td>Indian</td>
<td>3.50%</td>
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<tr>
<td>Present study</td>
<td>Indian</td>
<td>8.9%</td>
</tr>
</tbody>
</table>

Limitations of Study

We have conducted this study on dry human scapula. This study can be done by MRI of the scapular region, correlating findings with symptoms of suprascapular neuropathy.

Conflict of Interest

No external funding and no conflict of interest declared.

Acknowledgment

My sincere thanks to Department of Anatomy at B.J. Medical College for providing study material.

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17 Bayramoğlu A, Demiryürek D, Tüccar E, et al. Variations in anatomy at the suprascapular notch possibly causing

et al8 and S. Vedha et al10 among the Indian population (Table 4).

Conclusion

Suprascapular nerve entrapment can be caused by complete ossification of superior transverse scapular ligament and other types of suprascapular notch. The knowledge of such variation is of great help to physicians for diagnosis and treatment. The study of suprascapular notch by radiology and imaging techniques like X-ray, magnetic resonance imaging (MRI), and computed tomography (CT) scan, can be used for large population screening.