

The Coexistence of the Suprascapular Notch and Suprascapular Foramen: A Case Report

George Paraskevas ¹, Christos Lyrtzis ², Chrysanthos Chrysanthou ^{3, 2}, Nektarios Galanis ⁴, Nikolaos Anastasopoulos ⁵

Review began 03/30/2025

Review ended 04/03/2025

Published 04/03/2025

© Copyright 2025

Paraskevas et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

DOI: 10.7759/cureus.81669

1. Department of Anatomy and Surgical Anatomy, Faculty of Health Sciences, Medical School, Aristotle University of Thessaloniki, Thessaloniki, GRC **2.** Department of Anatomy and Surgical Anatomy, Aristotle University of Thessaloniki, Thessaloniki, GRC **3.** Department of Orthopedics and Traumatology, Interbalkan Medical Center, Thessaloniki, GRC **4.** Department of Anatomy and Surgical Anatomy, National and Kapodistrian University of Athens School of Medicine, Athens, GRC **5.** Department of Anatomy, Aristotle University of Thessaloniki, Thessaloniki, GRC

Corresponding author: Christos Lyrtzis, lyrtzischristos@gmail.com

Abstract

Commonly, the suprascapular notch (SN), which is bridged by the superior transverse scapular ligament (STSL), carries the suprascapular nerve (SSN). Variations in the form of that notch, as well as partial or complete ossification of the STSL or other proper ligaments in the SN area, could potentially lead to SSN entrapment syndrome. The current study displays a very rare variant of coexistence of a shallow SN and a suprascapular foramen (SF) in a male scapula of unknown age. Similar cases of coexistence of an SN and an SF detected in the literature, as well as their clinical applications, are discussed.

Categories: Anatomy, Orthopedics

Keywords: ossification, scapula, scapular notch, suprascapular foramen, suprascapular nerve neuropathy

Introduction

As it is commonly known, the suprascapular notch (SN) of the superior border of the scapula is crossed by the superior transverse scapular ligament (STSL). Thus, the formed fibro-osseous foramen conducts the suprascapular nerve (SSN) to the supraspinatus fossa, with the suprascapular vessels passing above the STSL. The ligament mentioned above is sometimes ossified, leading to the formation of the suprascapular foramen (SF) [1]. Such ossification has been frequently seen with increasing age based on the formation of enthesophytes [2]. However, genetic factors have been suggested as responsible for STSL ossification [3]. The incidence of SF ranges in various populations, between 2% in Indians of Manipur [4] and 30.76% in Brazilians [5]. Such an SF may potentially predispose to the SSN entrapment syndrome due to the SSN impingement on the SF margin when the arm is moving.

In the current study, we present, to the best of our knowledge, a very rare variant of the co-existence of an SF with a shallow SN, discussing its potential clinical applications and the relevant literature. The association of an SN with an SF may confuse the shoulder surgeon regarding how to deal with the SSN identification.

Case Presentation

The present study was performed on one dried human right scapula of adult male origin of unknown age obtained from the osteological collection of the Department of Anatomy, Medical School, Aristotle University of Thessaloniki, Thessaloniki. The current scapula displayed a relatively shallow U-shaped SN with the coexistence of an oblique bony bridge of 14 mm in width. The so-formed SSF was oval-shaped, with the vertical diameter being 5 mm and the transverse diameter 3 mm. The foramen was directed obliquely from medial to lateral side, situated at the medial aspect of the root of the coracoid process (Figures 1, 2). The anatomical variation was documented by repeated photographs taken by a digital camera, whereas the measurements were done by a metric digital caliper. The current scapula showed no concomitant lesions or abnormalities in the surrounding area of the detected variant.

How to cite this article

Paraskevas G, Lyrtzis C, Chrysanthou C, et al. (April 03, 2025) The Coexistence of the Suprascapular Notch and Suprascapular Foramen: A Case Report. Cureus 17(4): e81669. DOI 10.7759/cureus.81669



FIGURE 1: Anterior aspect of the right scapula, showing a shallow SN (blue arrow) and a SF (red arrow)

SN: suprascapular notch; SF: suprascapular foramen

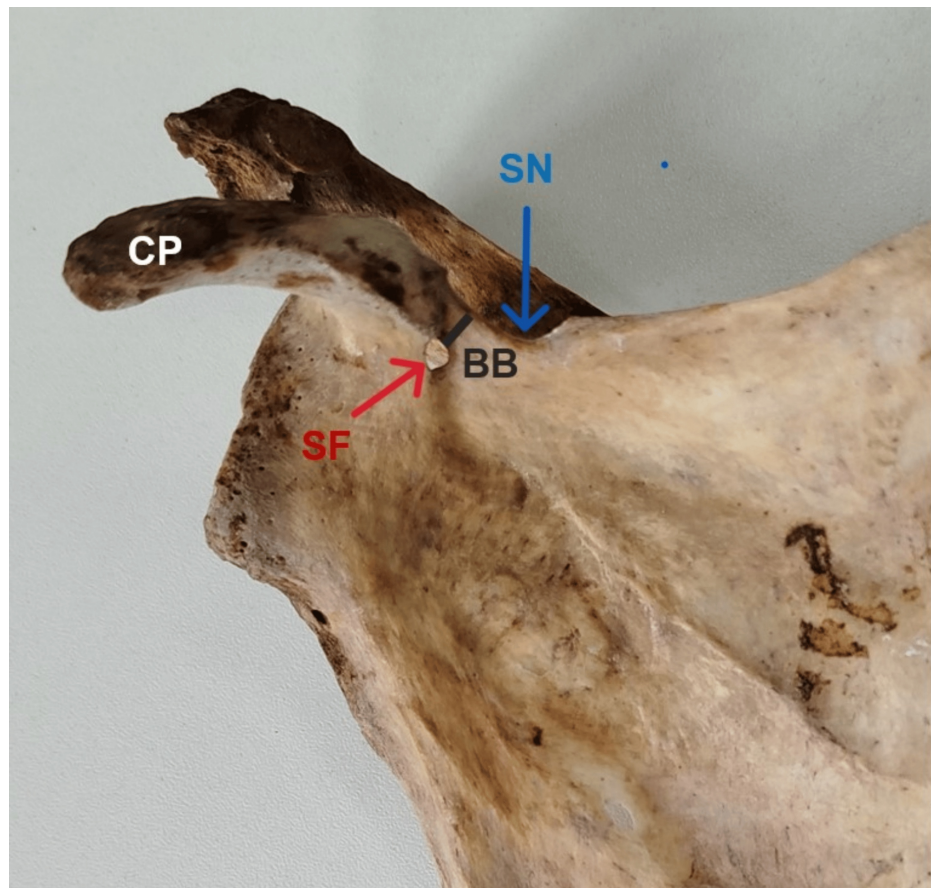


FIGURE 2: Bony bridge separating SN from SF

Anterior aspect showing a shallow SN separated by a BB, which separates SN from SF

SN: suprascapular notch; BB: bony bridge; SF: suprascapular foramen; CP: coracoid process

Discussion

The association of SN and SF was mentioned in one case by Hrdicka [2], then in another case by Ticker et al. [6], followed by Natsis et al. [7], who reported three such cases and another two cases in 2008 [8]. Later, Sinkeet et al. [9] found one such case, whereas Polguj et al. [10] observed one bony and two radiological cases of coexisting SN and SF. Ticker et al. [6] attributed the bony bridge of the SN to ossification of an accessory band of the STSL. According to the assumption by Polguj et al. [10], the anterior coracoscapular ligament (ACSL) is ossified, leading to SSF formation along with SN. The ACSL is a ligament placed underneath the STSL. These authors considered that the so-narrowed SSF compresses the SN, especially in shoulder motions, resulting in suprascapular neuropathy [10].

Our case of a shallowed U-shaped SN with coexistence of an SF is added to all the above-mentioned cases. Yavari et al. [11] considered that there is an increased inability for the surgeon to find the SSN in case of an empty SN associated with a very small SF. Moreover, the presence of a double SF has been reported in the literature, attributed to ossification of STSL and ACSL, ossification of a bifid STSL, partial ossification of the trifid STSL, or ossification of the bifid ACSL [12].

Entrapment syndrome or neuropathy of the SSN may occur in 1%-2% of cases of shoulder pain [13]. However, the frequency of suprascapular neuropathy, especially in athletes, has increased to reach 12% up to 33% [14]. Various bony bridges overlying the SSN in the region of the SN may lead to symptoms such as shoulder pain, weakness, and wasting of supraspinatus and infraspinatus muscles with subsequent weakness of abduction and external rotation of the ipsilateral shoulder joint [15]. A completely ossified STSL is related to narrowing of the space of SN, leading to likely entrapment of the SN. Such an ossified STSL, according to Yavari et al. [11], ranged between 0.3% in Eskimos to 30.76% in Brazilians. Moreover, ossified STSL is more frequent in men and on the right side [10], as in our case.

Also, knowledge of the SN morphology is necessary in cases of SNS reinnervation for shoulder reanimation after brachial plexus injuries [11]. Ultimately, a radiologist or surgeon is likely to misdiagnose SF as a lytic

lesion of the superior portion of the scapula [16].

Conclusions

The association of an SN with an SF is very rarely documented in the literature and should be kept in mind by the physician dealing with the shoulder region. The awareness of an SN and SF combination is crucial for the surgeon of the shoulder region and radiologist to properly examine the SN topography in the supraspinatus fossa, interpret a potential SN neuropathy, and differentiate a lytic lesion of the infraspinatus fossa from an SF.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Christos Lyrtzis, George Paraskevas, Chrysanthos Chrysanthou, Nektarios Galanis, Nikolaos Anastasopoulos

Drafting of the manuscript: Christos Lyrtzis, George Paraskevas

Critical review of the manuscript for important intellectual content: Christos Lyrtzis, Chrysanthos Chrysanthou, Nektarios Galanis, Nikolaos Anastasopoulos

Supervision: Christos Lyrtzis, George Paraskevas, Chrysanthos Chrysanthou, Nektarios Galanis, Nikolaos Anastasopoulos

Disclosures

Human subjects: All authors have confirmed that this study did not involve human participants or tissue.

Conflicts of interest: In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

References

- Williams PL: Gray's Anatomy. Churchill Livingstone, Edinburgh, UK; 1995.
- Hrdicka A: The adult scapula. Additional observations and measurements. *Am J Phys Anthropol.* 1942, 29:363-415. [10.1002/ajpa.1330290303](#)
- Cohen SB, Dines DM, Moorman CT: Familial calcification of the superior transverse scapular ligament causing neuropathy. *Clin Orthop Relat Res.* 1997, 131-5.
- Kalpana T, Renuka KN, Saratchandra S: Ossification of transverse scapular ligament. *J Evol Med Dent Sci.* 2013, 2:17-91. [10.14260/jemds/462](#)
- Silva J, Abidu-Figueiredo M, Fernandes R, Aureliano-Rafael F, Sgroot EA, Silva SF, Babinski MA: High incidence of complete ossification of the superior transverse scapular ligament in Brazilians and its clinical implications. *Int J Morphol.* 2007, 25:855-9.
- Ticker JB, Djurasovic M, Strauch RJ, April EW, Pollock RG, Flatow EL, Bigliani LU: The incidence of ganglion cysts and other variations in anatomy along the course of the suprascapular nerve. *J Shoulder Elbow Surg.* 1998, 7:472-8. [10.1016/s1058-2746\(98\)90197-5](#)
- Natsis K, Totlis T, Tsikaras P, Appell HJ, Skandalakis P, Koebeke J: Proposal for classification of the suprascapular notch: a study on 423 dried scapulas. *Clin Anat.* 2007, 20:135-9. [10.1002/ca.20318](#)
- Natsis K, Totlis T, Gigis I, Vlasik K, Papathanasiou E, Tsikaras P: A bony bridge within the suprascapular notch. Anatomic study and clinical relevance. *Aristotle Univ Med J.* 2008, 35:29-33.
- 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 (Warsz).* 2010, 69:241-5.
- Polguy M, Sibiński M, Grzegorzewski A, Grzelak P, Majos A, Topol M: Variation in morphology of suprascapular notch as a factor of suprascapular nerve entrapment. *Int Orthop.* 2013, 37:2185-92. [10.1007/s00264-013-2005-3](#)
- Yavari M, Hassanpour SE, Alizadeh Otaghvar H, Abdolrazaghi HA, Farhoud AR: The incidence of ossified superior transverse scapular ligament during nerve transfer through posterior shoulder approach. *Arch Bone Jt Surg.* 2019, 7:258-62.
- Das S, Suri R, Kapur V: Ossification of superior transverse scapular ligament and its clinical implications. *Sultan Qaboos Univ Med J.* 2007, 7:157-60.
- Boykin RE, Friedman DJ, Higgins LD, Warner JJ: Suprascapular neuropathy. *J Bone Joint Surg Am.* 2010, 92:2348-64. [10.2106/JBJS.I.01743](#)
- Shah AA, Butler RB, Sung SY, Wells JH, Higgins LD, Warner JJ: Clinical outcomes of suprascapular nerve decompression. *J Shoulder Elbow Surg.* 2011, 20:975-82. [10.1016/j.jse.2010.10.032](#)
- Gosk J, Urban M, Rutowski R: Entrapment of the suprascapular nerve: anatomy, etiology, diagnosis,

- treatment. *Ortop Traumatol Rehabil.* 2007, 9:68-74.
16. Lauland L, Fedders O, Stigard L, Kornum M: Suprascapular nerve compression syndrome. *Surg Neurol.* 1984, 22:308-12. [10.1016/0090-3019\(84\)90020-x](https://doi.org/10.1016/0090-3019(84)90020-x)