

Case report

## Double suprascapular foramen: a rare scapular notch variation

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**Abstract:** Anomalies and developmental variations of organs and anatomical structures are always at special attention since they often have clinical significance and at the same time may present a clinical challenge. The double suprascapular foramen is considered to be a rare variation of development and there were only few cases described in the literature. It also was proposed as a possible cause of suprascapular nerve entrapment syndrome. We present a case of double suprascapular foramen in a male cadaver with a review of its importance and probable cause.

**Keywords:** double suprascapular foramen, scapula, suprascapular nerve entrapment syndrome

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### Introduction

Anomalies and variations of development have special clinical importance and sometimes can be overlooked or misdiagnosed by medical specialists.

The suprascapular notch (SSN) is the site where the suprascapular nerve (SN) and the suprascapular vein, traverses the upper border of the scapulae under the superior transverse scapular ligament (STSL). This region is considered to be the most common location of suprascapular nerve injury and compression [1].

Based on the current data in the literature [2] the SSN can be classified into several groups based on the shape of the inferior border of the incisura and a comparison of the vertical and transverse diameters of the SSN:

- type I – complete absence of notch (20%),
- type II - wide blunted V-shaped notch occupying a third of superior border of scapula (10%),
- type III - symmetrical and U-shaped notch with parallel lateral margins (52%),
- type IV - small V-shaped notch (4%),
- type V – U-shaped notch with partial ossification of medial part of suprascapular ligament (10%).

Some of these types of anatomical variations can predispose people to suprascapular nerve trauma.

The suprascapular foramen can be classified in band and fan-shaped based on its form. The clinical significance is that the band-shaped type is more common and reduces the space below the ligament to a significantly greater degree [3].

One of the studies performed on 610 shoulder in Polish population showed only 32 cases of suprascapular foramen and only one case of double suprascapular foramen using computed tomography (CT) scans [4]. Taking in consideration that double

suprascapular foramen is extremely rare there were only few cases described in the literature [4-6].

### Case report

During a routine bone examination we observed that the right scapula of a 65 years old male cadaver presented a superior border without a suprascapular notch and with two foramina in its place. The length of the superior border, from the base of the coracoid process to the medial angle, was 6.5 cm; the length of the medial border, from the medial angle to the inferior angle, was 17.5. cm; while the lateral border, from the infraglenoid tubercle to the inferior angle of the scapula, was 15.2 cm. The width was 10.2 cm and 5.8 cm in the superior third and the inferior third, respectively. The suprascapular notch was absent and instead two foramina are present each about 4\*7 mm in diameter (Figures 1 and 3). There were no other anomalies of the scapula (Figures 1-3).

### Discussion

Suprascapular neuropathy causes shoulder pain and weakness and can be frequently overlooked by medical specialists. This condition was described for the first time by Kopell and Thompson in 1953 [7]. Since then it became an increasingly recognized condition with every year by medical specialists. Structures that surround this nerve can cause its compression and damage. One of the predisposing factors of this neuropathy is an ossified STSL [8]. STSL in approximately 3.1 % of cases can be bifid and have variations of development [9].

Avery and colleagues in 2002 described that 60% (of 27 cadavers) demonstrated a ligament located on the anterior aspect of the suprascapular foramen and was named the anterior coracoscapular ligament (ACSL). In 41% of cases it was present bilaterally and was associated with a substantially narrowing the suprascapular foramen [10].

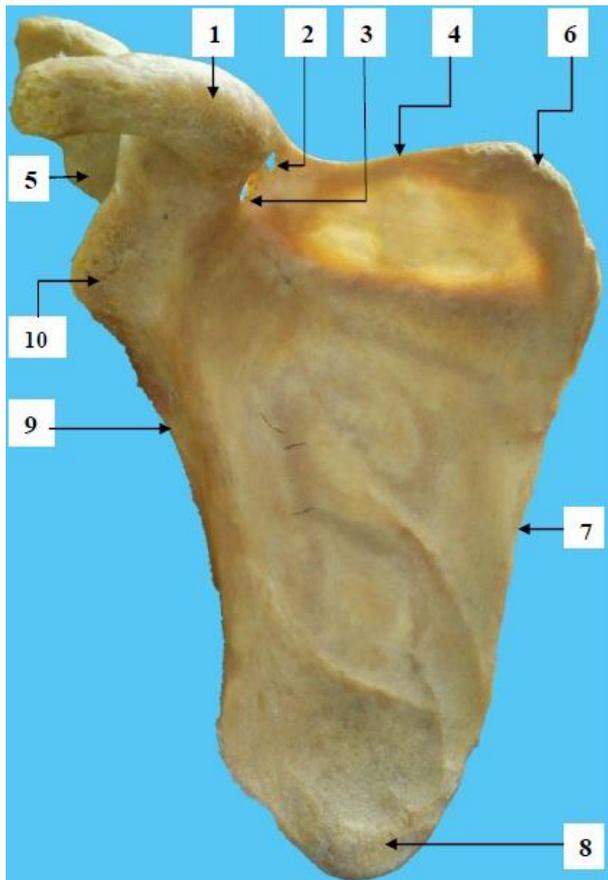


Figure 1. Anterior surface of the scapula: 1 – coracoid process; 2 and 3 – scapula foramen; 4 – superior border; 5 – acromion; 6 – superior angle; 7 – medial border; 8 – inferior angle; 9 – lateral border; 10 – glenoid cavity.

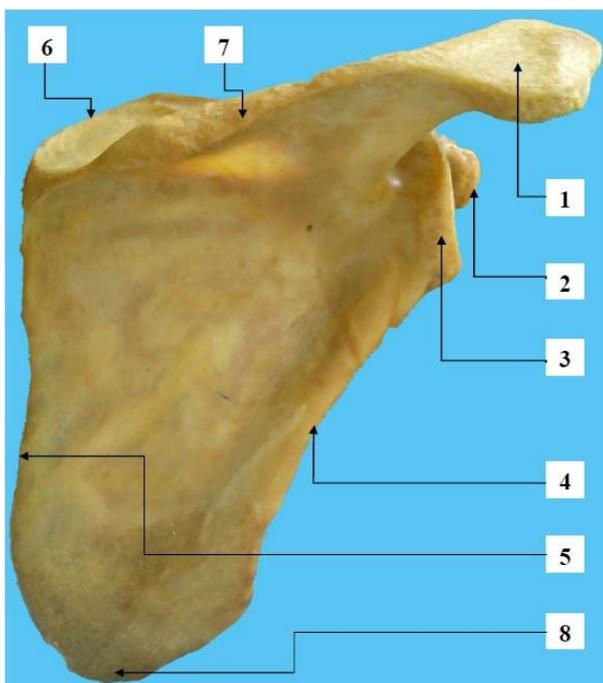


Figure 2. Posterior surface of the scapula: 1 – acromion; 2 – coracoid process; 3 – glenoid cavity; 4 – lateral border; 5 – medial border; 6 – superior border; 7 – spine of scapula; 8 – inferior angle.

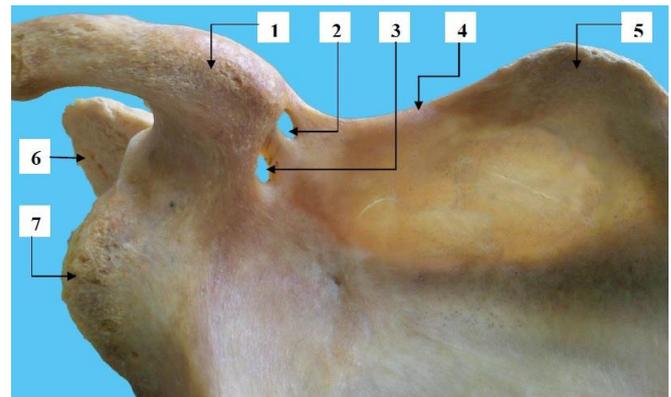


Figure 3. Anterior surface of the scapula (enlarged): 1 – coracoid process; 2 and 3 – scapula foramen; 4 – superior border; 5 – superior angle; 6 – acromion; 7 – glenoid cavity.

There were few incidental cases of a double foramen described in the literature [4-6]. Several hypotheses were proposed by Polgaj and colleagues [4] to explain such developmental variation:

- The ossification of the ACSL which is accompanied by the ossified STSL,
- The calcification of the bifid STSL,
- A partial ossification of the trifold superior transverse scapular ligament,
- The calcification of the bifid anterior coracoscapsular ligament.

Our case of double foramen is probably caused by ossification of the superior transverse scapular ligament and the anterior coracoscapsular ligament.

### Conclusion

A double suprascapular foramen is a rare developmental variation which should be kept in mind while diagnosing and treating suprascapular nerve entrapment syndrome. Knowledge about existence of the double suprascapular foramen can be useful for surgeons who perform decompression for suprascapular nerve entrapment, neurologists and other specialists who have patients with pain and weakness in the shoulder region.

### Conflict of interests

The authors declare that they have no conflict of interests.

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