

Complete Absence of Suprascapular Notch in Dried Human Scapulae in Gujarat Region: A Risk Factor for Suprascapular Nerve Compression



Medical Science

KEYWORDS : Scapula, Suprascapular notch, Suprascapular ligament, Suprascapular nerve

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ABSTRACT

The suprascapular notch, a regular feature of superior border of the scapula may be absent in some cases. This can cause suprascapular nerve entrapment neuropathy with clinical symptoms of vague pain on the suprolateral aspect of shoulder, weakness of abduction and external rotation of ipsilateral arm and atrophy of supraspinatus & infraspinatus muscles. The purpose of this study was to find incidence of complete absence of suprascapular notch in Gujarat region. 200 (Right-98, Left-102) dried human scapulae were examined for the absence of the suprascapular notch. 16% (32 in 200) scapulae presented with absence of suprascapular notch.(Right-17, Left-15) The regional variations in the incidence of complete absence of suprascapular notch and its involvement in suprascapular nerve entrapment neuropathy should be kept in mind during surgical or arthroscopic shoulder procedures.

INTRODUCTION:

The scapula is one of the bones of shoulder girdle. It is a flat bone situated in poterolateral aspect of chest wall. (Standring S, 2008) It presents many variations. (Hrdlicka, 1947; Edelson, 1995) The suprascapular notch is situated on the superior border of the scapula, just medial to the base of the coracoid process. It is converted into a suprascapular foramen by the suprascapular ligament. (Standring S, 2008) This notch is frequently bridged by bone in some animals. (Khan, 2006) The suprascapular ligament may get ossified in humans in some cases. (Cohen et al., 1997) This suprascapular foramen transmits the suprascapular nerve to the supraspinatus fossa, while suprascapular vessels pass above the ligament. (Standring S, 2008) Rengachary et al. (1979) have reported six different types of anatomical variations of suprascapular notch. In type I there is absence of notch (no discrete notch). Following to them, many different researchers have proposed different methods of classification of suprascapular notch. The variations in the suprascapular notch are accompanied by variations of the suprascapular ligament and constitute one of the potential risk factors to suprascapular nerve entrapment syndromes. (Rengachary et al, 1979; Edelson, 1995) The present study was intended to document and compare the incidence of complete absence of suprascapular notch in Gujarat region.

MATERIALS AND METHODS:

The present study was carried out on 200 (Right-98, Left-102) dried human intact scapulae of unknown sex obtained from Department of Anatomy, Government Medical College, Surat; Pramukhswami medical college, Karamsad and B J Medical College, Ahmedabad, Gujarat. Each intact scapula was observed for the presence or absence of the suprascapular notch. The scapulae in which there was no lateral confluent on the superior border (straight or concave) at a point where the suprascapular notch should have been considered as scapulae with complete absence of the suprascapular notch (scapulae without discrete notch). (David et al., 2008; Mahato & Suman, 2013).

RESULTS:

Present study revealed that 32 (17- right side, 15- left side) out of 200 (16%) scapulae presented with absence of suprascapular notch. The incidence was more prevalent on right side scapula (17.34%) as compared to left side scapula (14.71%). Incidence in different populations is given in Table.

DISCUSSION:

The entrapment of suprascapular nerve is an acquired neuropathy, most commonly at the level of suprascapular notch due to absence of notch, narrow dimensions of notch or ossification of the suprascapular ligament. Several morphologi-

cal variations and classifications of suprascapular notch have been reported in various populations.

Table-2: Incidence of absence of suprascapular notch

Sl. No	Author	Population	No. of specimen studied	Incidence (%)
1.	Rangachary et al.(1979)	American	211	8
2.	Natsis et al.(2007)	Greek	423	8.3
3.	Sinkeet et al(2010)	Kenyan	138	23.91
4.	Iqbal K.et al(2010)	Pakistani	250	18
5.	Polguy et al(2013)	Poland	81	6
6.	Mahato & Suman(2013)	Indian	112	19.64
7.	Present study (2014)	Indian	200	16

Rangachary et al.(1979) conducted a study on 211 American scapulae and classified suprascapular notch into six types(Type I – Type VI) based on the width at superior border of the notch, the widest point within the notch, and the depth of the notch. They reported scapula without discrete notch (Type I) in 8% of studied scapulae. In the present study, 16% incidence of complete absence of suprascapular notch (without discrete notch) was observed, which is higher than their report. Sinkeet et al.(2010) analyzed 138 human scapulae in Kenyan population and found 3 scapulae without notch and 30 scapulae with concave superior border(wide depression extending from medial superior angle to the base of coracoid process) having no discrete notch. In their study, 33 of 138(23.91%) had complete absence of notch. This is higher than finding of the present study (16%).

The incidence in present study (16%) is in consonance with Iqbal K et al. (2010)(18%) and Mahato & Suman (2013) (19.64%). A case of complete absence of suprascapular notch in Nigerian scapula has also been reported (Ofusori et al., 2008). Rekha B.S also found a case of complete absence of suprascapular notch in Indian scapula during a routine dissection.

Although it has been hypothesized that suprascapular nerve entrapment is more likely to be associated with a narrow V-shaped notch but no direct correlation between notch type and suprascapular nerve entrapment has been found clinically. (Cummins et al.,1998). While many authors have reported that the variations in the morphology of the suprascapular ligament like ossification (Khan, 2006), calcification (Cohen et al., 1997), bifurcation (Alon et al.,1988), trifurcation (Ticker

et al., 1998) and/or hypertrophy (Garcia & McQueen, 1981) is associated with suprascapular nerve entrapment neuropathy. Among the various factors, including variation in the shape of the suprascapular notch along with morphological variation of the suprascapular ligament causing suprascapular nerve entrapment, complete absence of the suprascapular notch may also be one of the predisposing factors for suprascapular nerve entrapment neuropathy. (David, 2008; Mahato & Suman, 2013)

The suprascapular nerve entrapment may occur at any point along its course but in the case of absence of suprascapular notch, compression of suprascapular nerve by the suprascapular ligament possibly occur on the superior border of the scapula. (Rengachary et al., 1979). This compression may be pronounced when the suprascapular ligament is ossified. Usually cases of Suprascapular nerve entrapment neuropathy complain of deep and diffuse, poorly localized dull or burning pain in the posterolateral aspect of shoulder, which exaggerate on activity. This pain can be elicited by palpation over the region of the scapular notch. In some cases the pain radiates to the ipsilateral extremity, the side of the neck or the front of the chest. The patients also report a feeling of weakness in the affected shoulder, especially when performing overhead activities due to weakness and atrophy of supraspinatus & infraspinatus muscles resulting from denervation of these muscles. (Holzgraefe et al., 1994)

The investigations like nerve conduction velocity (NCV) and electromyographic (EMG) studies, X-ray, CT Scan and MRI may be helpful in correct diagnosis. The electrophysiological studies and MRI should always be used when clinical findings are suggestive of suprascapular nerve entrapment.

Such morphological variability of the suprascapular notch of human scapulae as in the present study could provide well sorted data about absence of the suprascapular notch but more clinical, cadaveric and radiological studies need to be done as this study was performed in limited number of scapulae.

CONCLUSION:

The present study reveals high incidence of complete absence of suprascapular notch in Gujarat region and it can be considered as a one of the risk factors for suprascapular nerve entrapment neuropathy. This anatomical information should be taken into consideration during surgical or arthroscopic shoulder procedures. This can further be helpful in avoiding iatrogenic suprascapular nerve injuries during shoulder arthroscopies.

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