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Case Report

An Unusual Case Report of Suprascapular Compression Neuropathy as a Result of Non-Appearance of The Suprascapular Notch: An Anatomical Study

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Abstract

Suprascapular compression neuropathy being an inherited neuralgia know to be an infrequent source of shoulder disorders which mostly comes with pain at the back of the shoulder and tearing of the rotator cuff muscles mainly the supraspinatus (SS) and infraspinatus (IS) muscles leads to constriction of the suprascapular nerve located in the suprascapular notch. During a routine osteology class practical with a pre-clinical medical student in the second year of the Anatomy Department, Kampala International University, Western Campus, Ishaka, Uganda, was noted that the left shoulder bone of a male cadaver demonstrated an upper border with an absence of a suprascapular notch. There is no record about the absence of the suprascapular notch among the Ugandans and also in the whole east African population to date but according to the present investigation, there is an indication that non-appearance of the suprascapular notch can be found among the Ugandan population.

***Keywords:** Scapula, Shoulder Bone, Suprascapular Notch, Suprascapular Compression, Neuropathy*

Introduction

The scapula which is also known as the shoulder bone or shoulder blade triangular in shape works as the connection between the clavicle (collar bone) and the humerus (upper arm bone). The scapulae are found in both sides of the body that performs the prominent role in balancing the other bones which partakes in the swinging of the shoulder. It is a triangular bone that serves as a linking force between the clavicle and the humerus. This bone is positioned posteriorly (at the back half of the body). The scapula plays a very active role in stabilizing other bones that are involved in the rhythm of the shoulder.

Some numbers of muscles can be found at the region of the shoulder girdle with rotator cuff muscles, a network of nerves like brachial plexus, some upper arm muscles are located in the region also (Loukas, 2006), (Fallis, 2014). Suprascapular notch is mainly the location where we do experience the suprascapular compression neuropathy commonly seen at the side of the superior part of the shoulder bone located just at the coracoid process basement (Bhatia et al., 2006), (Ofusori et al., 2008). The suprascapular notch are the main areas for nerve entrapment due to the facts that they are mostly changed to foramen by the means of the suprascapular ligament used as a gateway of the suprascapular nerve that innervates both sensory and motor parts of the two rotator cuff muscles (supraspinatus and infraspinatus) joined with ligament of the shoulder and that of acromioclavicular joint (Soni et al., 2015). Six different groups of anatomical modifications of the suprascapular notch was previously discovered and describe by Rengachary *et al.* (Rengachary et al., 1979).

In most cases, the anatomy variant encountered in different suprascapular notch which play a vital role in suprascapular nerve compression which goes with a variation in the suprascapular ligament, also variation of the notch that does comes by its accompanied vein, passing through the superior boundary of the shoulder bone at the suprascapular ligament (SSL) are mostly accompanied by a suprascapular foramen (Ofusori et al., 2008), (Saritha, 2014).

Because most of the rotator cuff muscles are innervated by the suprascapular nerve, damage to this nerve can result in an indicative rotator cuff impairment of functioning (Ofusori et al., 2008). There are reports of these cases among other populations like India, Germany, and Nigeria (Kannan, 2014), (Natsis et al., 2007), (Ofusori et al., 2008) but there are no such reports amongst Ugandans and the whole East Africa region. Therefore, the present study intends to document a case of the absence of a suprascapular notch in the scapula bone of Kampala International University, Uganda.

Case Report

The present report is basically on the examination of the upper border of the male shoulder bone from the coracoid process laterally to the vertebral border of the scapula which appears to be a coarse indented pattern at the middle part and also the absentia of any lateral indentation in an area.

At the upper portion of the scapular shows a rough indentation structure present at the middle part of the shoulder bone with the absence of convergent sideway in the area where the suprascapular notch suppose to appear: therefore we discovered the non-appearance of the notch. It was observed that in an area at which the suprascapular notch supposed to appear thinner and opaque (represented by the " * " in Figure 1B and 2B).

This feature makes the bone appears in another form from that which was observed in the normal left shoulder bone in Figure 1A and 2A, which shows the superior border of the shoulder blade to be straight with a presence of suprascapular notch at a point in the middle 2/3rd and the lateral 3rd at the inferior level of the coracoid process of the scapula. The present cadaveric bone case report presents a case of the scapula bone with a complete lack of the suprascapular notch found in a Ugandan adult male shoulder bone: this could probably be the result of suprascapular compression neuropathy.

During a routine osteology class practical with a pre-clinical medical student in the second year of the Anatomy Department, Kampala International University, Western Campus, Ishaka, Uganda, it was noted that the left shoulder bone of a male cadaver demonstrated an upper border with an absence of a suprascapular notch [Figures 1B and 2B].

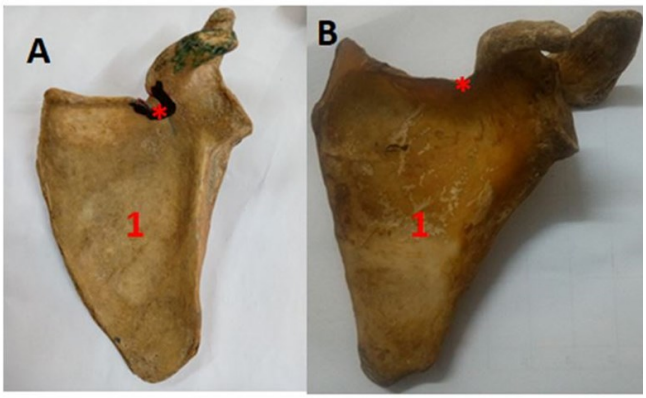


Figure 1A: Costal surface of the entire length of the left scapula showing presence of suprascapular notch which serves as control

Figure 1B: The whole length of the costal surface of the left scapula that shows the absent of suprascapular notch which is the basis of our study

KEY: * = Suprascapular notch, 1 = Subscapular fossa in normal cadaveric specimen [Figure 1A and B]

Figure 2A: Posterior surface of the entire length of the left scapula showing presence of suprascapular notch. Note its division into supraspinous and infraspinous fossae by the spine of the scapula.

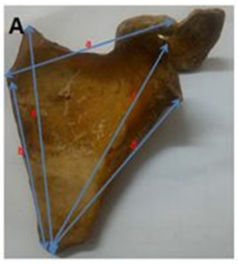
Figure 2B: The posterior surface of the entire length of the left scapula with the absence of suprascapular notch. Also note its division into supraspinous and infraspinous fossae by the spine of the scapula.

KEY: * = Suprascapula notch, 1= Supraspinous fossa, 2 = Spine of the Scapula, 3 = Infraspinous fossa in normal cadaveric specimens [Figures 2A and B].

From Figures 3A and B, the measurement of the length and width of the scapula for this report were represented by a, b, c, d, e, f, g respectively.

The scope measurement of the superior portion, in between the substructure of the coracoid process through the medial angle, was 6.0 cm; the distance of the medial border taken, in between the meddle angle through the inferior angle, was equal to 12.0 cm; while the measurement taken for the length of the lateral portion, starting at the supraglenoid and infraglenoid tubercle through the inferior angle of the scapula, are 16.0 cm and 14.0 cm respectively. The whole length of the scapula was measured to be 17.0 cm, and the width was also measured to be 10.0 cm and 5.8 cm, at the distance in between the tip of the acromion up to the medial end of the spine and also the distance in between the glenoid to the medial end of the spine, respectively. The weight of the entire right scapula was measured to be 93.3 g, obviously shows that the left shoulder blade we inspect in the present study had a notable facet marking.

The coastal facet was hollow Figure 1B, however the spine of the shoulder blade demarcated the posterior surface into supraspinous and infraspinous fossae Figure 2B for the fitment of both supraspinatus and infraspinatus muscles, accordingly, even as the site for suprascapular notch if it were to be present.



KEY : a = length of the superior border, from the base of the coracoid process to the medial angle, b = length of the medial border, from the medial angle to the inferior angle, c = length of supraglenoid tubercle to the inferior angle, d = length of the infraglenoid tubercle to the inferior angle, e = length of the scapula

KEY : f = Width of the scapula fron the tip of the acromium to the medial end of the spine, g = Width of the scapula from the glenoid to the the medial end of the spine

Discussion

Due to the anatomical importance of the scapula bone coupled with their variations, more conclusive investigation appears preferable and required to confirm more informations for us to synchronous more anatomical reports because of the knowledge of scapula anatomical variations are needed to prevent suprascapular compression neuropathy for its proper safety. The suprascapular notch being the area for the wound or injury to the suprascapular nerve that do leads to complete rigidity of the suprascapular ligament which is located inside the notch and at the inferior part of the transverse scapular ligament, the suprascapular notch which is responsible for housing the suprascapular nerve may also experience less capacity like in the case of accommodating the suprascapular artery and this can leads to a condition where the nerve will be under a lot of pressure. So in this kind of situation, the presence of complete calcification of the transverse scapular ligament will now make the space normally assigned for the suprascapular nerve and the vessels to be reduced which will eventually result in the suprascapular nerve entrapment. Some of the suprascapular notch anatomical variants have been previously reported though most of the reports which explained the suprascapular notch coupled with suprascapular notch turn to foramen had only been reported by (Natsis et al., 2007), (Ofusori et al., 2008), (Sinkeet et al., 2010), (Saritha, 2014). A rigorous findings in many publications show that there is no report on the non-appearance of the suprascapular notch in a Ugandan scapula and east Africa generally – this our study appears to be the first.

Apart from the variations in shape which could cause the suprascapular compression neuropathy, also thickened suprascapular ligament can also be a cause of the compression (Ide et al., 2003), (Ofusori et al., 2008). The non-appearance of the suprascapular notch was recorded to be the main influencing component for the suprascapular nerve compression syndrome (Freehill et al., 2012). Anytime there is an absence of notch, the ligament will no longer limit and confine the suprascapular nerve within the suprascapular notch, but constitute trauma to the nerve which may then be exposed to constant pressure and impingement by muscles and much movement around the shoulder (Plancher & Petterson, 2014). Because of the mobility of both shoulder and scapular so their frequent movement will result to stretch and cause trauma to the nerve due to the non-appearance of the notch. Furthermore, it was noted and recorded that the suprascapular nerve originates from the superior trunk present at the brachial plexus that is C5, C6 (Keith L. Moore, Arthur F. Dalley, 2013), (Plancher & Petterson, 2014).

Sometimes suprascapular nerve compression may occur in more than one site around its course and basically, compression is always pronounced in a situation of complete ossification of transverse scapular ligaments, whenever there is suprascapular nerve entrapment it will possibly result to the deterioration of both the supraspinatus and infraspinatus muscles because they are both innervated by the suprascapular nerve. Less frequently, the nerve may be also compressed distally around the site of the spinoglenoid notch (Post & Grinblat, 1993), (Ide et al., 2003), (Moore et al., 2018). In most of the cases, the suprascapular nerve is known as the main nerve of the upper limb that is associated with neuralgic amyotrophy (Gruber et al., 2017). Moreover, in some uncommon cases, the entrapment of the nerve are reported to be associated with various of mass lesions, lipoma, ganglion cysts, sarcomas, and metastatic carcinomas but the ganglion cysts are most commonly found at the spinoglenoid notch (Gruber et al., 2017), (Hazrati et al., 2003), (Hashimoto et al., 1994), (Hashimoto et al., 1994). Additionally, Compression of the suprascapular nerve can happen by various conditions through some ways of life like some activities, professions, and positions which are weight lifting, baseball pitchers, and volleyball (*Zeiss1993.Pdf*, n.d.), (Mazza et al., 2020), (Cummins et al., 1999).

Conclusion

From the present investigation, there is an indication that non-appearance of the suprascapular notch can be found among the Ugandan population.

Declaration of conflicting interests

The authors hereby wish to say that there is no conflict of interest as regards to the publishing of this paper.

Ethical approval

Institutional ethical approval was acquired from Kampala International University Western Campus (Nr.UG-REC-023/192020)…

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References

1. Bhatia, D. N., de Beer, J. F., van Rooyen, K. S., & du Toit, D. F. (2006). Arthroscopic Suprascapular Nerve Decompression at the Suprascapular Notch. *Arthroscopy - Journal of Arthroscopic and Related Surgery*, *22*(9), 1009–1013. https://doi.org/10.1016/j.arthro.2006.05.012
2. Cummins, C. A., Bowen, M., Anderson, K., & Messer, T. (1999). Suprascapular Nerve Entrapment at the Spinoglenoid Notch in a Professional Baseball Pitcher. *The American Journal of Sports Medicine*, *27*(6), 810–812. https://doi.org/10.1177/03635465990270062101
3. Fallis, A. . (2014). Moore - Clinically Oriented Anatomy 7th Ed. In *Lippincott Williams & Wilkins*. https://doi.org/10.1017/CBO9781107415324.004
4. Freehill, M. T., Shi, L. L., Tompson, J. D., & Warner, J. J. P. (2012). Suprascapular neuropathy: Diagnosis and management. *Physician and Sportsmedicine*, *40*(1), 72–83. https://doi.org/10.3810/psm.2012.02.1953
5. Gruber, L., Loizides, A., Löscher, W., Glodny, B., & Gruber, H. (2017). Focused high-resolution sonography of the suprascapular nerve: A simple surrogate marker for neuralgic amyotrophy? *Clinical Neurophysiology*, *128*(8), 1438–1444. https://doi.org/10.1016/j.clinph.2017.04.030
6. Hashimoto, B. E., Hayes, A. S., & Ager, J. D. (1994). Sonographic diagnosis and treatment of ganglion cysts causing suprascapular nerve entrapment. *Journal of Ultrasound in Medicine*, *13*(9), 671–674. https://doi.org/10.7863/jum.1994.13.9.671
7. Hazrati, Y., Miller, S., Moore, S., Hausman, M., & Flatow, E. (2003). Suprascapular Nerve Entrapment Secondary to a Lipoma. *Clinical Orthopaedics and Related Research*, *411*(411), 124–128. https://doi.org/10.1097/01.blo.0000063791.32430.59

8. Ide, J., Maeda, S., & Takagi, K. (2003). Does the inferior transverse scapular ligament cause distal suprascapular nerve entrapment? An anatomic and morphologic study. *Journal of Shoulder and Elbow Surgery*, *12*(3), 253–255. https://doi.org/10.1016/S1058-2746(02)00030-7.

9. Kannan, U. (2014). Morphometric Study of Suprascapular Notch in Indian Dry Scapulae with Specific Reference to the Incidence of Completely Ossified Superior Transverse Scapular Ligament. *JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH*. https://doi.org/10.7860/JCDR/2014/7836.4089

10. Keith L. Moore, Arthur F. Dalley, A. M. R. A. (2013). *Clinically Oriented Anatomy - Keith L. Moore, Arthur F. Dalley, A. M. R. Agur - Google Books*. Clinically Oriented Anatomy.

11. Loukas, M. (2006). Book review: Clinically Oriented Anatomy, 5th Ed. by Keith L. Moore and Arthur F. Dalley II. *Clinical Anatomy*. https://doi.org/10.1002/ca.20303

12. Mazza, D., Iorio, R., Drogo, P., Gaj, E., Viglietta, E., Rossi, G., Monaco, E., & Ferretti, A. (2020). Did the prevalence of suprascapular neuropathy in professional volleyball players decrease with the changes that occurred in the serving technique? *Physician and Sportsmedicine*, *0*(0), 1. https://doi.org/10.1080/00913847.2020.1766344

13. Moore, K. L., Dalley II, A. F., & Agur, A. M. R. (2018). Clinically oriented anatomy, Eight edition. In *Lippincott Williams & Wilkins*.

14. Natsis, K., Totlis, T., Tsikaras, P., Appell, H. J., Skandalakis, P., & Koebke, J. (2007). Proposal for classification of the suprascapular notch: A study on 423 dried scapulas. *Clinical Anatomy*, *20*(2), 135–139. https://doi.org/10.1002/ca.20318

15. Ofusori, D., Ude, R., Okwuonu, C., & Adesanya, O. (2008). Complete absence of the suprascapular notch in a Nigerian scapula: A possible cause of suprascapular nerve entrapment. *International Journal of Shoulder Surgery*, *2*(4), 85. https://doi.org/10.4103/0973-6042.44146

16. Plancher, K. D., & Petterson, S. C. (2014). Posterior Shoulder Pain and Arthroscopic Decompression of the Suprascapular Nerve at the Spinoglenoid Notch. *Operative Techniques in Sports Medicine*, *22*(1), 73–87. https://doi.org/10.1053/j.otsm.2014.06.001

17. Post, M., & Grinblat, E. (1993). Suprascapular nerve entrapment: Diagnosis and results of treatment. *Journal of Shoulder and Elbow Surgery*, *2*(4), 190–197. https://doi.org/10.1016/1058-2746(93)90062-L

18. Rengachary, S. S., Burr, D., Lucas, S., Hassanein, K. M., Mohn, M. P., & Matzke, H. (1979). Suprascapular entrapment neuropathy: A clinical, anatomical, and comparative study. II: Anatomical study. In *Neurosurgery* (Vol. 5, Issue 4, pp. 447–451). https://doi.org/10.1227/00006123-197910000-00007

19. Saritha, S. (2014). Coexistence of suprascapular notch and suprascapular foramen: A rare anatomical variation and its clinical correlation–A case report. *Int J of Med Sci and Clin Invention*, *1*(2), 65–68.

20. Sinkeet, S. R., Awori, K. O., Odula, P. O., Ogeng'o, J. A., & Mwachaka, P. M. (2010). The suprascapular notch: Its morphology and distance from the glenoid cavity in a Kenyan population. *Folia Morphological*, *69*(4), 241–245.

21. Soni, G., Malik, V. S., & Boddeti, R. K. (2015). Morphometric Analysis of Suprascapular Notch: Review of Literature. *International Journal of Anatomy and Research*, *3*(4), 1624–1628. https://doi.org/10.16965/ijar.2015.267 *zeiss1993.pdf*. (n.d.).

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