

Hypertrophy of the subscapularis muscle might be an etiologic factor for suprascapular nerve entrapment at the suprascapular notch

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Alp Bayramoglu (1)
Deniz Demiryurek (1)
Mine Erbil (1)
Mustafa Aktekin (2)
Onur Tetik (3)
M. Nedim Doral (4)

(1) Department of Anatomy, Hacettepe University, Faculty of Medicine, Ankara, Turkey
(2) Department of Anatomy, Mersin University Faculty of Medicine, Mersin, Turkey
(3) Department of Sports Medicine, Hacettepe University Faculty of Medicine, Ankara, Turkey
(4) Department of Orthopaedics, Hacettepe University Faculty of Medicine, Ankara, Turkey

Correspondence Address

Alp Bayramoğlu M.D., Ph.D.
Hacettepe University, Faculty of Medicine,
Department of Anatomy
Sıhhiye, Ankara, 06100, Turkey
Phone: 90 (312) 305 23 57
Fax: 90 (312) 310 71 69
e-mail: alp@bayramoglu.org

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Abstract

During the routine dissection of a 57 year old male cadaver, a hypertrophied subscapularis muscle was detected on the right side. Hypertrophied subscapularis muscle originated from the anterior surface of the scapula and inserted to the lesser tubercle of the humerus. Its superior part covered the entire anterior surface of the suprascapular notch and lay on the suprascapular nerve while it travelled through the notch under the superior transverse scapular ligament. Since the subscapularis muscle functions actively in the repetitive movements of the shoulder joint, hypertrophy of this muscle like in our case might be one of the reasons for the suprascapular nerve entrapment seen at the suprascapular notch specially for the ones who are involved in the overhead activities such as volleyball players and baseball pitchers.

Key words: subscapularis muscle, hypertrophy, suprascapular nerve, entrapment neuropathy

Introduction

Suprascapular nerve entrapment syndrome is first described by Thompsen and Kopel in 1959 [1]. Since then causes of suprascapular nerve entrapment including compression by tumors and ganglion cysts, traction injuries, direct trauma such as fracture of the scapula and anatomical variants of the region have been well documented in the literature [2-7].

In this case, we present a hypertrophied subscapularis muscle covering the entire anterior surface of the suprascapular notch of a male cadaver and its possible compression effect on the suprascapular nerve. This type of an entity has not been reported previously as an etiologic factor in suprascapular nerve entrapment.

Case Report

During routine dissection of the right shoulder of the 57 year old male cadaver, we observed a hypertrophied subscapularis muscle. The subscapularis muscle originated from the medial border and anterior surface of the scapula and the fibers travelled laterally inserting to the lesser tubercle of the humerus. The superior part of the muscle was covering the entire anterior surface of the suprascapular notch where the suprascapular nerve passes through to the infraspinous fossa to innervate the infraspinatus muscle. Muscle fibers were also attached to the borders of the U-

shaped notch and the membranous tissue covering the suprascapular notch. Suprascapular nerve was lying under the bulk of the muscle fibers before entering the suprascapular notch (Figs. 1, 2).

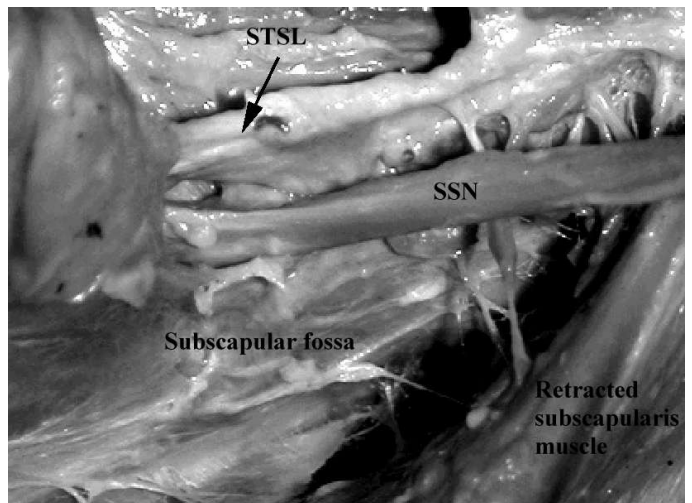
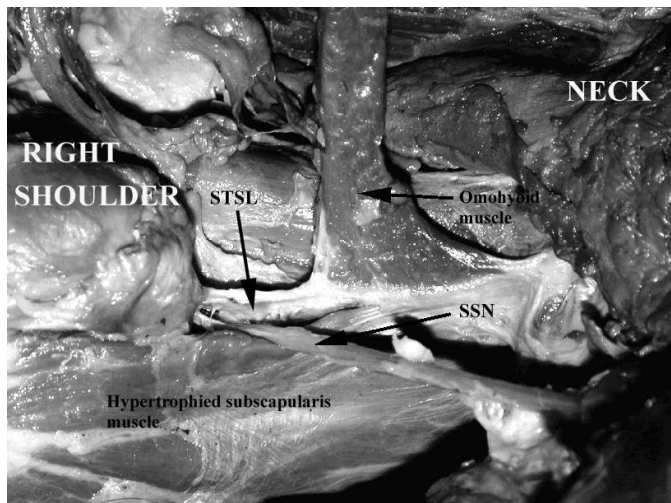
Superior transverse scapular ligament was located normally, roofing the suprascapular notch.

On the left shoulder, the superior part of the subscapularis muscle was located below the level of the inferior border of the suprascapular notch and the muscle fibers did not have any relationship with the suprascapular nerve.

Discussion

The suprascapular nerve is liable to compression as are other peripheral nerves passing through the aponeurosis and fibroosseous tunnels specially when extreme joint movements allow repeated nerve distraction or twisting at points where the nerve is surrounded by a fixed tissue.

Suprascapular nerve originates from the superior trunk of the brachial plexus and runs laterally beneath the trapezius parallel to the omohyoid muscle. It enters the suprascapular fossa through the suprascapular notch, inferior to the transverse scapular ligament. Then runs deep to the suprascapular muscle and curves around the lateral border of the scapular spine (spinoglenoid notch) with the suprascapular artery to reach the infraspinous fossa [8]. Suprascapular nerve is a mixed peripheral nerve and its motor components innervate the suprascapular and



infraspinatus muscles while the sensory components supplies the acromioclavicular and glenohumeral joints. Along the course of the suprascapular nerve the suprascapular and the spinoglenoid notches are described as the two potential entrapment sites [9-12].

Clinically suprascapular nerve entrapment is characterized by pain in the posterolateral region of the shoulder, atrophy of the infraspinatus and supraspinatus muscles and weakness of the arm's external rotation and abduction.

Some anatomic predisposing factors have been reported in literature for the suprascapular nerve entrapment. Rengachary et al. studied the suprascapular notches and they described six different types according to their enclosure and configuration. They stated that the primary etiologic factor in nerve entrapment syndrome was created by a "sling effect" which was defined as the angulation of the nerve against suprascapular ligament, resulting in nerve irritation. They could not demonstrate translational movements in their study [13].

Alon et al. reported a case of bilateral suprascapular nerve entrapment due to anomalous bifid superior transverse

scapular ligaments. According to Alon et al., congenital anomaly of the superior transverse scapular ligament with the frequent protraction of the shoulder, was the most plausible cause of the suprascapular nerve entrapment [5]. Calcification of the superior transverse scapular ligament has also been reported as one of the causes of suprascapular nerve entrapment syndrome [14].

In our case hypertrophied subscapularis muscle was significantly covering the suprascapular notch and the suprascapular nerve was running right under the muscle bulk. We believe this type of a hypertrophied subscapularis muscle might be a possible cause of a compression on the suprascapular nerve resulting a friction and inducing local inflammatory changes.

Since the subscapularis muscle functions primarily as the medial rotator and adductor of the arm and helps stabilizing shoulder joint, hypertrophy of this muscle might occur in ones who are involved in repetitive overhead activities such as volleyball and baseball and this entity might be one of the predisposing factors of the suprascapular nerve entrapment seen in these individuals.

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