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Case Report

Neuromuscular variations in the posterior triangle of the neck – a case report

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ABSTRACT

The lower part of the posterior triangle of the neck is one of the important areas of the body because of the presence of brachial plexus. The thorough knowledge of anatomy and anatomical variations in this region are important for surgeons, anesthesiologist and physiotherapists. We report here the neuromuscular variations at the lower part of the posterior triangle of the neck. In the current case, the dorsal scapular nerve made a loop around the deep branch of transverse cervical artery. There was an additional muscle arising from the first rib and getting inserted to the inner surface of the superior angle of the scapula. The long thoracic nerve pierced this additional muscle. The loop of dorsal scapular nerve around the artery may lead to neurovascular symptoms and the abnormal muscle pierced by the long thoracic nerve may cause to neuromuscular symptoms.
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Key words [variations] [dorsal scapular nerve] [long thoracic nerve]

Introduction

Dorsal scapular nerve arises from the ventral ramus of the fifth cervical spinal nerve. It usually pierces the scalenus medius muscle, passes deep to levator scapulae and supplies rhomboideus major and rhomboideus minor muscles. The long thoracic nerve is formed by the contribution from the ventral rami of C5, C6 and C7 spinal nerves. C5 and C6 roots pierce scalenus medius muscle before they join the C7 root. The nerve descends deep to brachial plexus and superficial to the serratus anterior muscle on the thoracic wall. We found certain variations in the course and relations of these two nerves. We also noted the presence of an additional muscle in the lower part of the posterior triangle of the neck.

Case Report

During the routine dissections for the medical undergraduates, variations in the course and relations of dorsal scapular and long thoracic nerves were found. The variations were located at the right posterior triangle of a male cadaver aged approximately 60 years. The dorsal scapular nerve came from ventral ramus of the C5 spinal nerve and made a loop around the deep branch of transverse cervical artery [Figures 1 and 2]. The further course and distribution of the nerve was normal. The long thoracic nerve was normal at its origin. On its course, it pierced the additional muscle that was in the lower part of the triangle. The further course of this nerve was also normal. There was an additional muscle in the lower part of the posterior triangle [Figures 1 and 2]. This muscle originated from the upper surface of the first rib near the attachment of scalenus medius and inserted into the inner surface of the superior angle of the scapula. The muscle was pierced and supplied by the long thoracic nerve.

Discussion

Variations of the dorsal scapular nerve are rare. Instead of its normal course deep to the levator scapulae, the nerve might pierce that muscle [1]. Tubbs et al. have reported intertwining of dorsal scapular nerve around the dorsal scapular artery [2]. In the current case, the nerve was making a loop around the deep branch of transverse cervical artery. This type of the looping might result in the nerve compression caused by the artery. Previous reports indicate that the compression of the dorsal scapular nerve may result in discomfort and soreness in the neck, shoulder and back [3].

Long thoracic nerve shows a few variations in its course and distribution. A contribution has been reported from the fourth cervical and from the fifth cervical nerve, which may not join the main trunk of the nerve but pass directly to the upper digitations of serratus anterior muscle [1]. The root from the seventh cervical nerve may be missing and an additional root from the eighth cervical nerve may be present [1]. There is no evidence in the literature for long thoracic nerve piercing an additional muscle in the above-mentioned region. This type of piercing might result in nerve entrapment that might lead to weakness of serratus anterior muscle. Carrying heavy

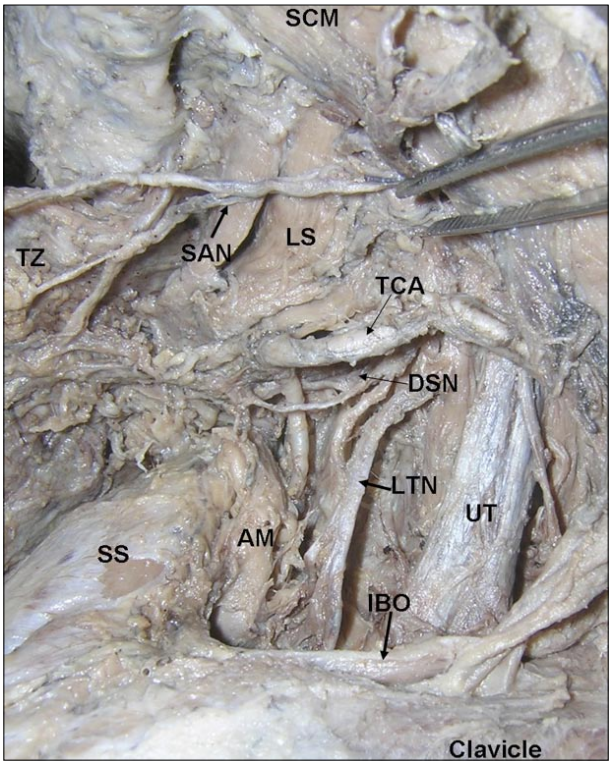

Figure 1. Dissection of the posterior triangle of the neck showing the neuromuscular variations. Color version of figure is available online. *(**SCM:** sternocleidomastoid; **TZ:** trapezius; **SS:** supraspinatus; **AM:** abnormal muscle; **SAN:** spinal accessory nerve; **TCA:** transverse cervical artery; **LS:** levator scapulae; **DSN:** dorsal scapular nerve; **LTN:** long thoracic nerve; **UT:** upper trunk of brachial plexus; **IBO:** inferior belly of omohyoid)*

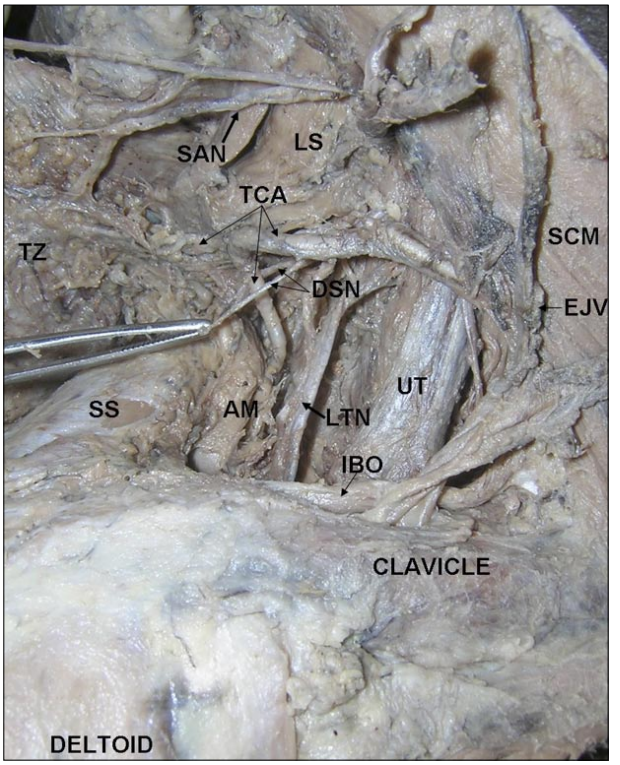

Figure 2. Dissection of the posterior triangle of the neck. Color version of figure is available online. *(**SCM:** sternocleidomastoid; **TZ:** trapezius; **SS:** supraspinatus; **AM:** abnormal muscle; **SAN:** spinal accessory nerve; **TCA:** transverse cervical artery; **LS:** levator scapulae; **DSN:** dorsal scapular nerve; **LTN:** long thoracic nerve; **UT:** upper trunk of brachial plexus; **IBO:** inferior belly of omohyoid; **EJV:** external jugular vein)*

loads that compress the shoulders is a possible etiological factor for long thoracic nerve entrapment [4]. In patients who present with pain, weakness, limitation of shoulder elevation, and scapular winging with medial translation of the scapula and rotation of the inferior angle toward the midline, possibility of above said variation has to be kept in mind.

An additional muscle arising from the first rib and getting inserted to the superior angle of the scapula has not been reported yet. This muscle might help the serratus anterior in overhead abduction of the shoulder joint. Carrying heavy load on the shoulder might compress this muscle and the long thoracic nerve that pierces it, which in turn can lead to neuromuscular symptoms such as pain and muscle palsy.

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