

Case reports with special reference to the innervation, development and clinical significance of the subclavius posticus and the termination of the facial vein in South Indian cadavers

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SUMMARY

During the routine dissection of the head and neck, a variation in the termination of the common facial vein was noticed in two (a male aged 93 years and a female aged 53 years) South Indian cadavers. In the male, an accessory muscle, the subclavius posticus was also observed in the left posterior triangle. The muscle was attached posteriorly to the superior angle and the adjoining part of the superior border of the scapula along with the attachment of the inferior belly of the omohyoid muscle. Anteriorly, the muscle was attached to the first costal cartilage. On its course, this muscle crossed the brachial plexus and subclavian vessels anteriorly and was innervated by the suprascapular nerve. The relationship of this muscle to the neurovascular structures in the neck should be borne in mind while accessing the thoracic outlet syndrome. In addition to this, the common facial vein joined the external jugular vein on the left side.

In the female cadaver the termination of the common facial vein was also into the

external jugular vein on the left side, but no accessory muscle was found. Knowledge of the variation of the vein is important for the intravenous cannulation, for therapeutic or diagnostic purposes, and for the surgeons performing reconstructive surgery.

Key words: Subclavius posticus – External jugular vein – Common facial vein – Suprascapular nerve

INTRODUCTION

The posterior triangle of the neck is bounded anteriorly by the sternocleidomastoid muscle and posteriorly by the trapezius. It is subdivided into the occipital triangle and the subclavian triangle by the inferior belly of the omohyoid muscle. In the region of the subclavian triangle, many accessory muscles associated with the clavicle and the first rib have been described previously. Tountas and Bergman (1993) reported the existence of scapulocostalis minor, scapulocostoclavicu-

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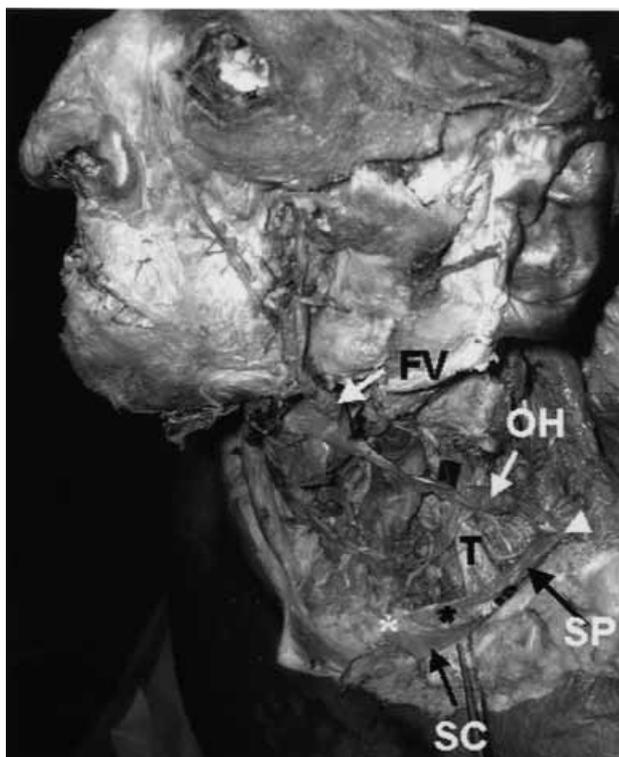


Fig. 1. The clavicle was retracted downwards to show the subclavius muscle (SC). Note the superior relation of the subclavius posticus (SP) to the subclavius muscle. Black * indicates the fascial sheath connecting the two muscles. White * indicates the first costal cartilage where the two muscles are attached anteriorly. White arrowhead shows the continuation of the inferior belly of the omohyoid (OH) and the posterior attachment of the subclavius posticus (SP). T: trunks of the brachial plexus; FV: facial vein.

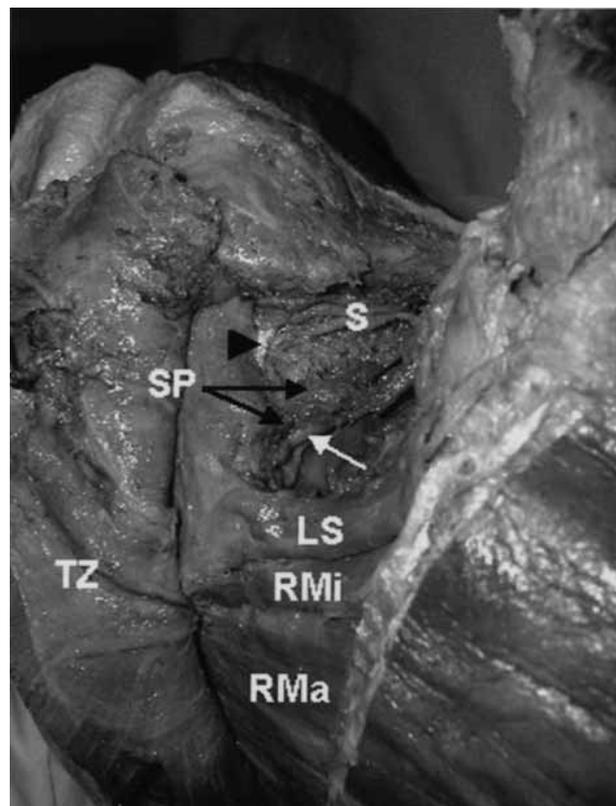


Fig. 2. Trapezius muscle (TZ) was reflected laterally from the midline to expose the posterior attachment of the subclavius posticus (SP). White arrow: inferior belly of omohyoid; Black arrowhead: suprascapular ligament; S: suprascapular vessels and nerve; LS: levator scapulae muscle; Rmi: rhomboid minor muscle; Rma: rhomboid major muscle.

laris, scapuloclavicularis muscles and a subclavius muscle that had two slips in this region. Here we report an inconstant muscle and a variation of the common facial vein that were found in the region of the subclavian triangle during routine dissection.

MATERIALS AND METHODS

During routine dissection in the pre-clinical medical program on cadavers donated to the department of Anatomy of the Christian Medical College (Vellore, India) for the purpose of teaching and research, variations were observed on the left side of the neck in the cadavers of a ninety-three-year old male and a fifty-three-year old female (South Indian).

OBSERVATIONS

Case 1: In the male cadaver, an accessory muscle was found in the subclavian triangle on the left side. The muscle ran horizontally in an anteroposterior direction. It was deep to the transverse cervical vein, but it was super-

ficial to the transverse cervical artery, subclavian vessels and the brachial plexus. It was superior to the subclavius muscle (Fig. 1).

The muscle was tendinous at its anterior attachment but partly fleshy at its posterior attachment. Its anterior attachment was to the superior surface of the first costal cartilage, just posterior to the attachment of the subclavius muscle (Fig. 1). This accessory muscle was attached posteriorly to the superior angle and the adjoining part of the superior border of the scapula (Fig. 2). This was continuous with the attachment of the inferior belly of the omohyoid muscle (Fig. 1). The fascia covering the subclavius posticus extended inferiorly to run continuous with the fascial sheath of the subclavius muscle anteriorly (Fig. 1). The suprascapular nerve innervated the muscle. In this cadaver, the external jugular vein was very large on the left side. The left common facial vein drained into the external jugular vein while the right vein drained into the internal jugular vein.

Case 2: In the fifty-three-year old female cadaver, the termination of the left common facial vein was into the left external jugular

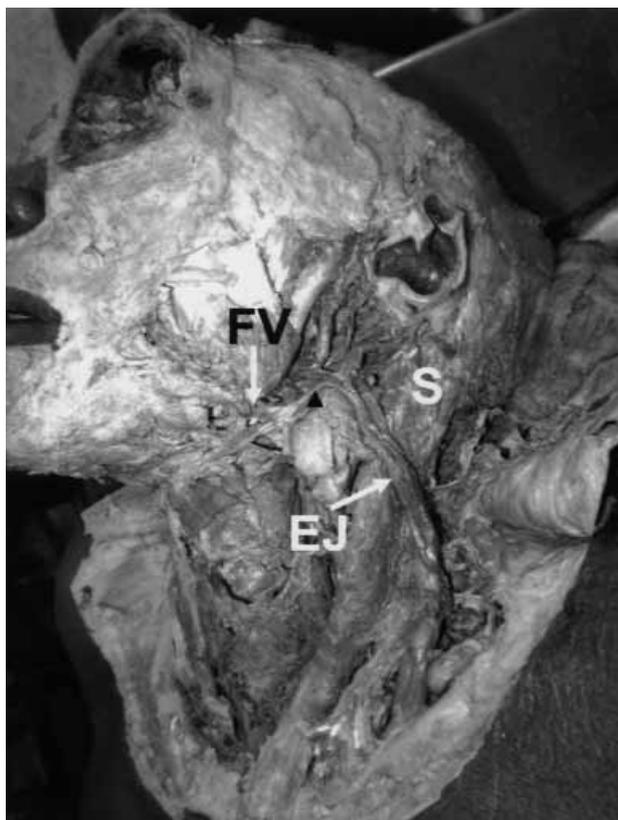


Fig 3. Shows the facial vein (FV). Black arrowhead indicates the common facial vein draining into the external jugular vein (EJ). S: sternocleidomastoid muscle.

vein (Fig. 3), as observed in the male cadaver. The right common facial vein was normal. No accessory muscle was found in this cadaver.

DISCUSSION

Various anomalous muscles have been reported in the region of the subclavian triangle. The subclavius posticus is one of the rare anomalies in this region. In 1800, Rossenmuller (cited by Akita et al., 2000) first reported the presence of this aberrant muscle in the neck. Since then very few reports have appeared regarding this muscle. However, several attachments have been described for this muscle by different authors. An incidence of 4.8 % has been documented in the Japanese population (Akita et al., 2000). Aziz (1979) also reported the presence of the subclavius posticus in a patient with Edwards' syndrome. In most cases, this aberrant muscle has been reported on the left side of the neck (Akita et al., 1996; Sarikcioglu and Sindel, 2001; Forcada et al., 2001). Eisler (cited by Akita et al., 2000) described the origin of the subclavius posticus as the first costal cartilage and inser-

tion as the coracoid process or the upper margin of the scapula. In their study, Tountas and Bergman (1993) reported that this muscle arose from the first costal cartilage and inserted into the cranial border of the scapula or to the fascia over the supraspinatus. Forcada et al. (2001) described the origin of the muscle as the upper margin of the scapula and transverse scapular ligament and the insertion as the superior surface of the first rib cartilage in a Spanish male cadaver.

The innervation of the subclavius posticus had been reported to be either the suprascapular nerve (Forcada et al., 2001; Akita et al., 2000; Sarikcioglu and Sindel, 2001), or the nerve to the subclavius (Akita et al., 1996), or the nerve to the inferior belly of the omohyoid muscle (Akita et al., 2000). The only other case of a subclavius posticus muscle documented in the Indian population was reported by Shetty et al. (2006). The muscle was reported to take its origin from the superior surface of the first rib and its costal cartilage and to become inserted into a thick ligament that extended from the medial end of the suprascapular notch, and was innervated by the nerve to the subclavius. In the present study, the attachments of the muscle and the nerve supply were similar to those described in a Turkish female by Sarikcioglu and Sindel (2001).

The subclavius seems to be a persistent representative of a group of muscles that are more perfectly developed in the lower mammals. In mammals which lack a clavicle, like many ungulates, a strong muscle-band passes transversely across the upper part of the thorax from the sternum and first costal cartilage to the scapula (Piersol, 1923). The muscle bands, which normally degenerate, occasionally persist as an accessory muscle in humans. Akita et al. (1996) proposed that the subclavius posticus would derive from the intermediate region of the band between the subclavius muscle and the inferior belly of the omohyoid muscle. The common attachments of the subclavius posticus and the inferior belly of the omohyoid muscle on the scapula observed in this study support this hypothesis.

The thoracic outlet syndrome has been reported to be due to compression of the brachial plexus, subclavian artery and subclavian vein in the interscalene triangle, the costoclavicular space, or in the subpectoral space (Atasoy, 2004). Compression could be due to the presence of a cervical rib, an anomalous muscle, or a fibrous strand. The subclavius

posticus has been considered to be a possible cause of the thoracic outlet syndrome due to its anatomical relationship with the brachial plexus and the subclavian vessels (Forcada et al., 2001) and to the Paget-von Schrotter syndrome, which has been recognized as a spontaneous or an effort-related thrombosis of the axillo-subclavian vein (Akita et al., 1996).

In addition to the presence of the subclavius posticus muscle, the left side of the neck also had a variation in the termination of the common facial vein in the male cadaver. The draining of the facial vein into the external jugular vein observed in the two cases of our report has been documented in 9% of the North Indian population (Gupta et al., 2003). This anomalous drainage of the common facial vein observed in humans has been attributed to the persistence of the drainage pattern found in the horse, ox and dog where the facial vein drains into the external jugular vein. Variations in the external jugular vein should be borne in mind, since the external jugular vein has been increasingly used in intravenous canulation for therapeutic or diagnostic purposes. Knowledge of the variation of the vein is important for surgeons doing reconstructive surgery.

The presence of an accessory muscle called the subclavius posticus should be borne in mind as a possible cause of the thoracic outlet syndrome.

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