Unilateral Variation in the Origin of Sternocleidomastoid Muscle: A Case Report

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Abstract

The sternocleidomastoid muscle commonly comprises two heads: sternal and clavicular. The space between the two heads is called the lesser supraclavicular fossa. During routine cadaveric dissection on the left side of the neck, a larger than normal lesser supraclavicular fossa along with an accessory clavicular head originating from the clavicle, the middle third part, (just lateral to the clavicular head) was observed. On the right side it was normal. An accessory clavicular head originating from the middle one third of the clavicle was present on the left side. Dimensions of the left side lesser supraclavicular fossa were: Base- 3.70cm, medial border- 5.30cm, lateral border- 3.80cm. Accessory head of the sternocleidomastoid muscle, 2.50cm lateral to the normal clavicular head forming a second fossa between them was noted. The accessory head of sternocleidomastoid muscle may play an important role in myo-cutaneous flap reconstruction during plastic surgery. It may also be the underlying cause of torticollis due to the decreased mobility of the muscle on account of the extra head.

Keywords: Sternocleidomastoid, lesser supraclavicular fossa, cadaver, accessory clavicular head.

Introduction:

The Sternocleidomastoid Muscle (SCM) is mostly produced from the paraxial (pre-optic) mesoderm and occipital (post-optic) somites, with some contribution from the neural crests[1,2].

The side of the neck is divided into posterior and anterior triangles by Sternocleidomastoid muscle. The inferior border of the mandible, the medial line of the neck, and the anterior border of the Sternocleidomastoid muscle comprise the anterior triangle[3]. The suprahyoid and infrahyoid muscles are found in the anterior triangle. The posterior triangle is defined by SCM anteriorly, the clavicle inferiorly, and the trapezius muscle posteriorly and contains the scalene muscles. The SCM is a large, tactile muscle that is easy to identify.

The muscle starts from the upper edge of the sternal manubrium along with the inner quadrant of the upper surface of the clavicle. These two parts of the muscle join together to form one muscle that runs obliquely upwards. It attaches to the temporal bone's mastoid process and the front section of the superior nuchal line[4]. SCM fibres run parallelly; this is not a pennate muscle[4].

The bilateral sternocleidomastoid muscle is a contralateral rotator as well as ipsilateral flexor of the head and neck, made up of one sternal and one clavicular head[5]. The sternocleidomastoid muscle splits the quadrangular in shape area into the anterior and posterior triangles. There is a triangular gap between the two heads that is known as the lower supraclavicular fossa.

Several critical nerves originate from the posterior border of the sternocleidomastoid, understanding its morphological anatomy is essential for both surgical and radiographic purposes[6]. The sternocleidomastoid muscle is an essential surgical marker for doctors. A thorough understanding of its variants helps prevent diagnostic and surgical difficulties[6].

Although the SCM has been thoroughly studied, reports of uncommon anatomical variations such as additional heads and abnormal fossa formation are scarce. In this case report, we describe a rare example seen during cadaveric dissection, featuring an accessory clavicular head of the SCM and the existence of a second, well-defined supraclavicular fossa. Detailed morphometric data for both fossae are offered, which are not usually encountered in the literature. This case adds essential information by describing a rare muscle variant and providing accurate measures, emphasizing the clinical relevance of being

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aware of such differences during surgical planning, regional anesthetic, and radiographic interpretation. This case report attempts to improve clinical safety in the neck area by linking morphological anatomy to clinical relevance.

Case report:

Upon routine cadaveric dissection of the supraclavicular triangle and sternocleidomastoid muscle of an adult male aged approximately 70 years at KAHER's J.N. Medical College, Belagavi certain variations were observed. An accessory clavicular head of length 5.20 cm and breadth 0.6 cm which originated from the middle third of the clavicle was present on the left side.

Table 1: Dimensions of lesser supraclavicular fossa

Border	Dimensions
Base	3.70 cm
Medial border	5.30 cm
Lateral border	3.80 cm

A larger than normal lesser supraclavicular fossa was observed. The dimensions of it are shown in table 1.

Table 2: Dimensions of the second fossa

Border	Dimensions
Base	2.40 cm
Medial border	6.30 cm
Lateral border	5.20 cm

A second fossa between normal clavicular head and accessory head of sternocleidomastoid muscle was also observed. The dimensions of the second fossa are shown in table 2.

The right side was normal (no variations were noted).

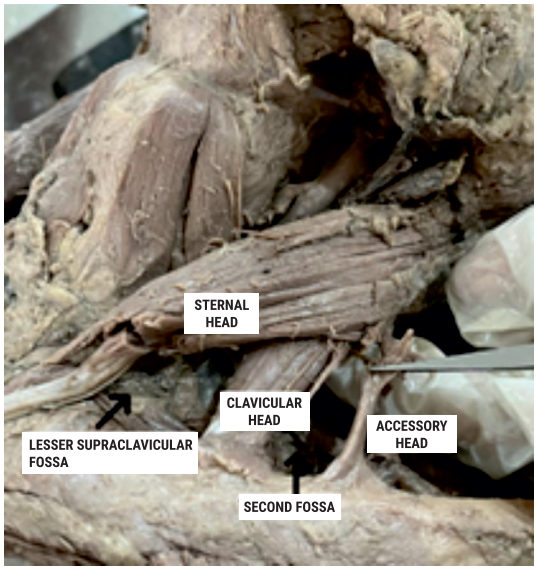

Figure 1: Presence of accessory clavicular head and second fossa

Figure 2: Right side was normal

Discussion:

The sternocleidomastoid muscle (SCM) exhibits anatomical variations that have significant clinical implications. These variations can impact surgical planning and clinical diagnosis, particularly in cases of torticollis or cervical dystonia.

The SCM originates from the manubrium sterni and clavicle and inserts into the lateral surface of the mastoid process[7]. SCM functions include rotation, flexion, and extension which can be compromised by variations[8].

There have been reports of variations in the origin of both heads of the sternocleidomastoid muscle, however abnormalities in the clavicular head are more prevalent than in the sternal head. Typically, the clavicular origin is narrower than the sternal head[9]. The most plausible explanation for this additional clavicular head development is the maintenance of a residual muscle slip from the separation of the trapezius and SCM around the day of embryonic development 54[5].

Cherian et al (2008)[10] and Fazliogullari et al (2010)[11] both reported a unilateral extra clavicular head. Kaur et al. (2013) identified six origins of the sternocleidomastoid muscle[12]. In 2007, Ramesh et al. identified an extra slip of origin on both sides of the sternocleidomastoid muscle's clavicular head[13].

Conclusion:

Anaesthetists and surgeons must be aware of variations in the muscle's structure when performing myocutaneous cervical oesophagoplasty, internal jugular vein catheterization, suture line for carotid artery protection, myocutaneous flap for facial defects, as a flap for superficial parotidectomy, and many other head and neck surgeries[14]. Physiotherapists

are also responsible for treating instances of sternocleidomastoid syndrome, torticollis, neck-shoulder strain problems, upper-crossed syndrome, and functional limitations in neck flexion[15].

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