

**Case Report****ADDITIONAL HEAD OF STERNOCLEIDOMASTOID MUSCLE****Prakash Babu Billakanti\****Department of Anatomy, Kasturba Medical College, Manipal University, Manipal, Karnataka, India***RESUMEN**

Un caso raro de cabeza unilateral y adicional de músculo esternocleidomastoideo fue encontrado en un cadáver masculino adulto en el lado izquierdo. Esta cabeza se originó en el tercio medio de la clavícula y se unió al resto del músculo en su centro. Sin embargo, no había tal tropiezo adicional en el lado opuesto. No había variaciones en su suministro de inserción y nervio. Esta observación puede ser de importancia para los cirujanos de cabeza y cuello y cirujanos de cirugía plástica durante su práctica clínica

**Palabras claves:** Músculo esternocleidomastoideo; variación anatómica; cabeza de clavicular

**ABSTRACT**

A rare case of unilateral, additional head of sternocleidomastoid muscle was found in an adult male cadaver on the left side. This head originated from the middle one third of the clavicle and joined the rest of the muscle in its middle. However, there was no such additional slip on the right side. There were no variations in its insertion and nerve supply. This observation may be of importance to head and neck surgeons and plastic surgeons during their clinical practice.

**Key words:** Sternocleidomastoid muscle; Anatomical variation; clavicular head

**INTRODUCTION**

The sternocleidomastoid muscle is a prominent muscle across the side of neck. It divides the side of the neck into anterior and posterior triangles. It is an important surgical landmark as it is related to many neurovascular structures in the neck. It originates from two heads. The sternal head is rounded and tendinous. It originates from the upper part of the anterior surface of the manubrium sterni and ascends posterolaterally. The clavicular head is variable in width and originates from the superior surface of the medial one third of the clavicle and ascends almost vertically. The two heads of origin are separated by a triangular interval, which corresponds to a surface depression, the lesser supraclavicular fossa. As they ascend the clavicular head spirals behind the sternal head and blends with its deep surface below the middle of the neck, forming a thick, rounded belly. The muscle gets inserted to the lateral surface of the mastoid process from its apex to superior border and lateral part of the superior nuchal line by a thin aponeurosis. The fibres of the muscle cross in such a manner that the clavicular fibres get inserted on to the mastoid process and the sternal fibres get inserted to the superior nuchal line. The sternocleidomastoid gets its motor supply from the spinal accessory nerve and the proprioceptive innervations from the cervical spinal nerves. The muscle derives its arterial supply from the occipital, posterior auricular, superior thyroid and suprascapular arteries. Sternomastoid muscle while acting alone flexes the neck laterally and turns the face to the opposite side. When the muscles of the two sides contract simultaneously, they flex the head and

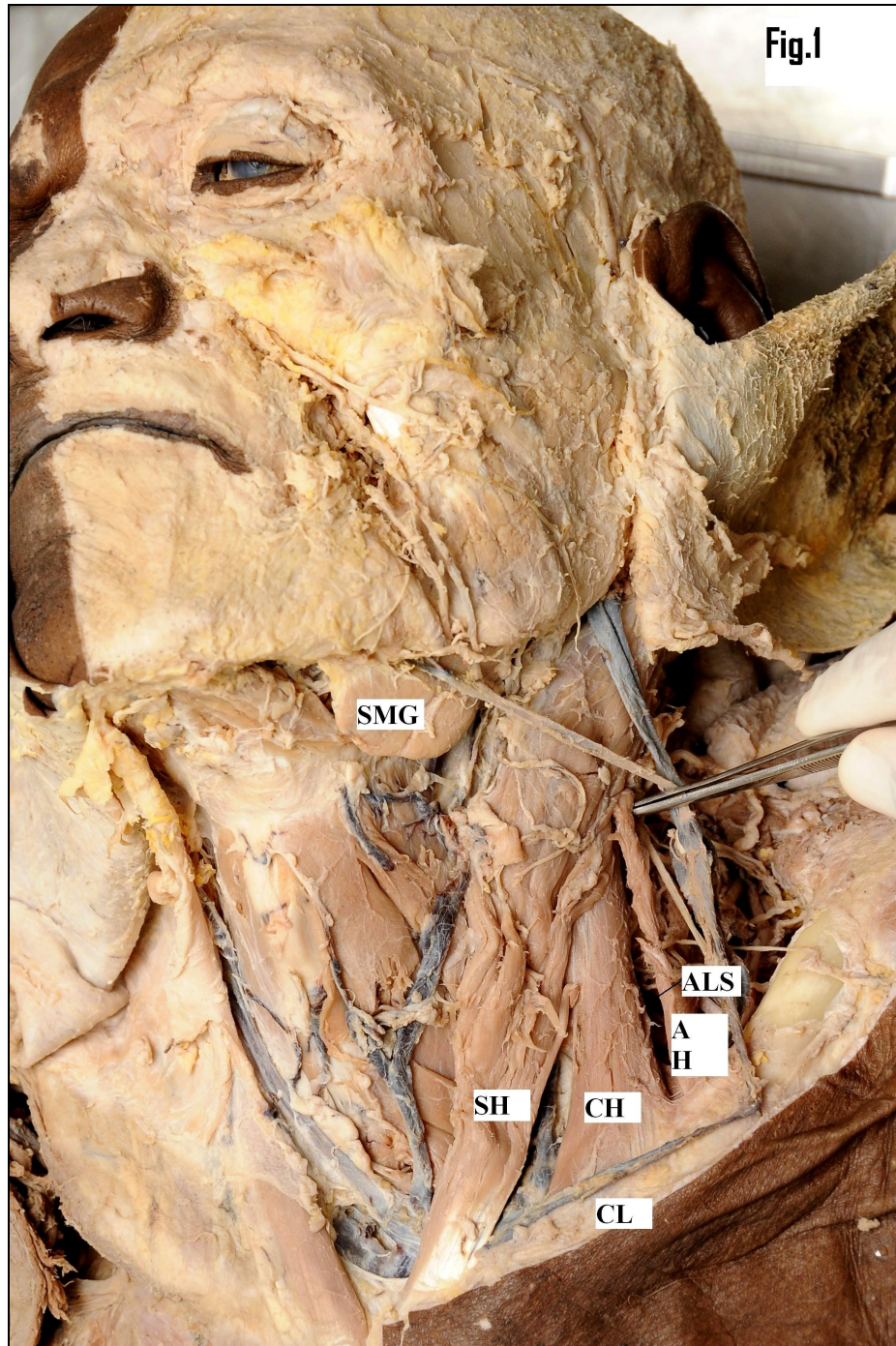
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\* Correspondence to: **Dr. Prakash Babu Billakanti**, Kasturba Medical College, Manipal University, Manipal, Karnataka-576104, India. billakantibabu@yahoo.co.in

**Received:** 15 May 2010. **Revised:** 7 June 2010. **Accepted:** 13 July 2010

neck. Spasm of the sternocleidomastoid muscle (Standing et al, 2005), usually of unknown origin but sometimes congenital, is one cause of a

flexion deformity of the neck known wryneck torticollis; other muscles that rotate and flex the neck also may contribute to torticollis.



**Figure 1.-** Superficial dissection of the left side of the neck. SH – sternal head of sternocleidomastoid; CH – clavicular head of sternocleidomastoid; AH – additional head of sternocleidomastoid; CL – clavicle; SMG – submandibular salivary gland, ALS- Additional lesser supraclavicular fossa

## CASE REPORT

During routine dissections for medical students, in an adult male cadaver a rare case of additional slip of origin was found, in the sternocleidomastoid muscle (Fig. 1). The variation was found on the left side of the neck and was unilateral. The additional third head took its origin from the superior surface of the middle one third of the clavicle as a fleshy belly. The size of this belly was half the size of normal clavicular head of the muscle. Its fibres passed deep to the normal clavicular head of the muscle and then blended with the other fibres of sternocleidomastoid. The additional head covered the major neurovascular structures in the supraclavicular triangle of neck. It was supplied by a branch of spinal accessory nerve. The two clavicular heads of origin of sternocleidomastoid muscle were separated by a small triangular interval (compared to the interval between the sternal head and normal clavicular head), which corresponds to one more surface depression, the additional lesser supraclavicular fossa (Fig.1).

## DISCUSSION

The sternocleidomastoid muscle varies much in the extent of its origin from the clavicle. Variations in the insertions are very rare. In some cases the clavicular head may be as narrow as the sternal; in others it may be as much as 7.5 cm in breadth. When the clavicular origin is broad, it is occasionally subdivided into several slips, separated by narrow intervals. The sternocleidomastoid shares the same developmental source as the trapezius, the post-sixth branchial arch. More rarely, the sternocleidomastoid and trapezius muscles are fused with each other. Studies by Bergman et al (1988) regard this fusion between the sternocleidomastoid and trapezius muscles as normal. The tendinous intersections have been noted in sternocleidomastoid by Bergman et al (1988). These intersections are probably due to the development of the muscle by several myotomes. The sternocleidomastoid muscle frequently separates into other parts, which are arranged in two parts: a superficial sternomastoid, sterno-occipital and cleido-occipital part; and a deep layer consisting of a deep sternomastoid and cleidomastoid part. The names indicate the attachment of various parts. Knowing the 5 parts of the sternocleidomastoid muscle is important for harvesting the muscle flap. Studies by Mustafa (2006) say that

supernumerary cleido-occipital, more or less separate from the sternomastoid has a reported frequency of 33%.

Studies by Bergman et al (1988) established that, occasionally, the lower portion of the muscle is traversed by a tendinous intersection, which may indicate the formation of the muscle from different myotomes. The supraclavicularis muscle arises from the manubrium behind the sternocleidomastoid muscle and passes behind the sternocleidomastoid muscle to the upper surface of the clavicle.

Studies by Nayak et al (2006), Ramesh et al (2007) and Saju et al (2008) have reported the presence of additional bellies in sternomastoid muscle bilaterally.

Studies by Coskun et al (2002) have reported multiple variations of sternocleidomastoid muscles. They observed sternocleidooccipital, cleidomastoid and sternomastoid muscles in the same cadaver unilaterally.

In the present finding, the additional slip in the clavicular origin of sternocleidomastoid muscle may be due to abnormal splitting in the mesoderm of post-sixth branchial arch. However, the relevance of this finding whether it is associated with the condition of wry neck and other congenital deformities of the neck that needs to be evaluated by further studies.

The knowledge of variations of sternocleidomastoid muscle is important for head and neck surgeons. It is also useful for the plastic surgeons. The sternocleidomastoid muscle can be used in several ways during surgery. Studies by Conley and Gullane (1980) have explained various uses of the muscle such as a) its use along with a part of clavicle to reconstruct mandible, b) reconstruct mandibular defects, c) transport as a myocutaneous flap for reconstruction of the oral floor and d) use as a suture line to protect carotid and innominate arteries.

Knowledge of sternocleidomastoid muscle consists of additional parts and the muscle fibers in each part are lying in the same direction from origin to insertion in the same fascial package may be important for harvesting the muscle flap reconstruction during parotid surgery is an effective method of covering the surgical defect and possibly preventing Frey's syndrome. Thus, it would be possible to choose more appropriate muscle parts.

The additional head reported here may not have any functional advantage. Since it covers the important neurovascular structures in the lower part of the neck, it might cause difficulties in the surgeries in that region. It may also interfere in invasive techniques. Plastic surgeons can make

best use of this additional head for muscle graft surgeries.

## REFERENCES

- Bergman, R. A.; Thomson, S. A.; Afifi, A. K. & Saadeh, F.A. 1988 Compendium of Anatomic Variation, In: Muscles. Urban and Schwarzenberg, Baltimore, 32-33.
- Conley, J. & Gullane, P. J. 1980 The sternocleidomastoid muscle flap. *Head Neck Surg.*, 2(4):308-11.
- Coskun, N.; Yildirim, F. B. & Ozkan, O. 2002. Multiple muscular variations in the neck region- case study. *Folia Morphol. (Warsz)*, 61: 317-9.
- Mustafa, M. A. Neuroanatomy. 2006 10th National Congress of Anatomy Bordum, Turkey, September 5: 6-10.
- Nayak, S. R.; Krishnamurthy, A.; Sj, M. K.; Pai, M. M.; Prabhu, L. V. & Jett. 2006, R. A rare case of bilateral sternocleidomastoid muscle variation. *Morphologie*, 90: 203-04.
- Ramesh, R. T.; Vishnumaya, G.; Prakashchandra, S. K. & Suresh, R. 2007. Variation in the origin of sternocleidomastoid muscle. A case report. *Int. J. Morphol.*, 25: 621-23.
- Standring, S.; Berkovitz, B. K. B.; Hackney, C. M.; Ruskell, I. G. L. *Gray's Anatomy. 2005 The Anatomical Basis of clinical practice. 39th Churchill & Livingstone, Edinburgh. 536.*
- Saju B.C & Nayak S. 2008. A Rare Case of Unilateral Third Head of Sternocleidomastoid Muscle. *Int. J. Morphol.*, 26: 99-101.
- Williams, P. L.; Bannister, L. H.; Berry, M. et al. *Gray's Anatomy. 1995 In: Muscle. Edited by Stanley Solomons. 38<sup>th</sup> Churchill Livingstone, Edinburgh. 804-05.*