

Unusual Third Head of the Sternocleidomastoid Muscle from the Investing Layer of Cervical Fascia

Inusual Tercera Cabeza del Músculo Esternocleidomastoideo
desde la Lámina Superficial de la Fascia Cervical

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SUMMARY: The abnormal origin, presence of additional head and layered arrangement of fibers are the reported variations of sternocleidomastoid muscle in the past. In the present case we report a rare unusual origin of third head of the sternocleidomastoid muscle in a 60 year-old male cadaver. This additional head originated from the investing layer of cervical fascia in the roof of the subclavian triangle close to the clavicle and traversed obliquely upward, forward and fused with clavicular head. The insertion and nerve supply of the muscle was found to be normal.

KEY WORDS: Sternocleidomastoid muscle; Anatomical variation; Third head.

INTRODUCTION

Sternocleidomastoid muscle lies obliquely across the side of the neck and divides the side of the neck into anterior and posterior triangles. It originates as two heads, the medial or the sternal head which is tendinous and rounded; and the lateral or the clavicular head. The sternal head originates from the upper part of the anterior surface of the manubrium sterni. The lateral head originates from the superior surface of the medial end of the clavicle. The triangular interval between the two heads of origin forms a surface depression, the lesser supraclavicular fossa. The two heads blend into round, thick muscle belly which is then inserted as a strong tendon onto the lateral surface of the mastoid process from its apex to superior border, and as a thin aponeurosis into the lateral half of the superior nuchal line of the occipital bone.

The muscle is innervated by the spinal part of accessory nerve along with branches from ventral rami of C2-3 and sometimes ventral rami of C4 spinal nerves. It is vascularized by the branches of suprascapular, superior thyroid, occipital and posterior auricular arteries. Acting alone, the sternocleidomastoid muscle flexes the neck laterally and rotates the face to the opposite side. Acting together, the muscle of two sides flexes the head and neck forcibly (Williams *et al.*, 1995).

CASE REPORT

During the routine dissection classes for first year Medical undergraduates, we came across the variation in the origin of sternocleidomastoid, in the right side neck of a 60 year-old male cadaver (Figs. 1 A and B). In the present case, in addition to its normal sternal and clavicular heads, the right sternocleidomastoid muscle had an additional muscular head from the investing layer of cervical fascia near the lower part of roof of the subclavian triangle, close to the clavicle. The additional head was arising at a distance of 3.8 cm lateral to the clavicular head. The fibers of the additional head were directed obliquely upward and forward to fuse with the clavicular head at a distance of 4 cm from the clavicle. The additional head divided the subclavian triangle into large medial and small lateral compartments. All three heads were blending into a flat, thick muscle belly which was inserted normally onto lateral surface of the mastoid process and the lateral part of superior nuchal line of the occipital bone. The additional head was widely separated from the clavicular head (3.8 cm) when compared to the interval between the sternal and clavicular heads (2.6 cm). The additional head was also supplied by the spinal accessory nerve.

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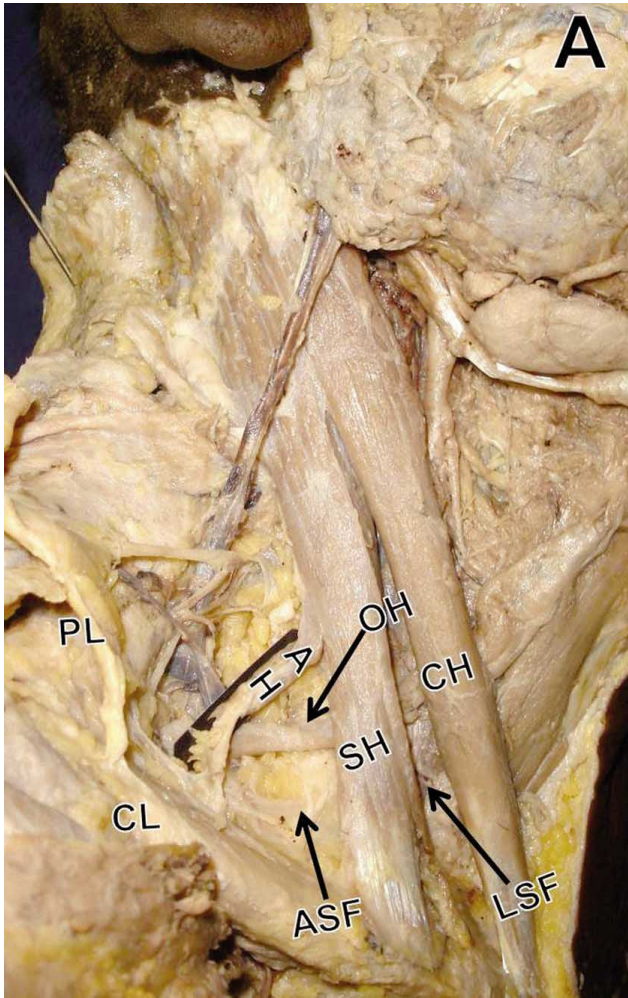


Fig. 1A. Superficial dissection of right side of the neck showing the variation in the origin of sternocleidomastoid muscle. SH- sternal head, CH- clavicular head, AH- additional head, OH- omohyoid, ASF- additional lesser supraclavicular fossa, LSF- lesser supraclavicular fossa, PL- platysma, CL- clavicle.

DISCUSSION

The abnormal origins, presence of additional bellies, layered arrangement of fibers are the reported variations of the sternocleidomastoid muscle in the past. Variations are more common in the clavicular head of origin and in the layered arrangement of its fibers. However, the variation in its insertion is very rare. The origin of the clavicular head may be as broad as 7.5 cm and occasionally divided into many slips with narrow intervals when it is broad. During the development, sternocleidomastoid and trapezius muscles share a common premuscle mass from the last two occipital and upper cervical myotomes. This muscle mass splits and separates at 9 mm stage of development. In some cases the

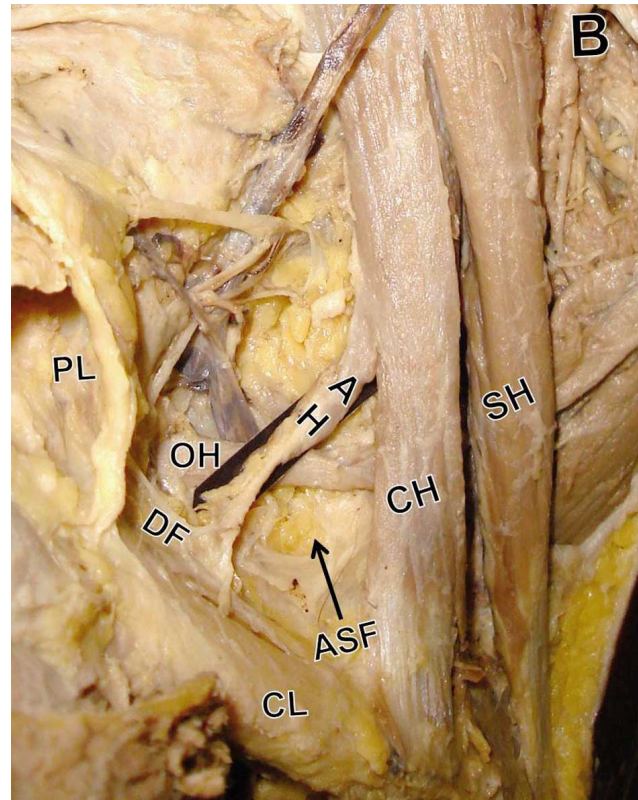


Fig. 1B. Superficial dissection of right side of the neck showing the variation in the origin of sternocleidomastoid muscle. SH- sternal head, CH- clavicular head, AH- additional head, OH- omohyoid, DF- deep fascia, ASF- additional lesser supraclavicular fossa, PL- platysma, CL- clavicle.

splitting may be incomplete; hence sternocleidomastoid can be fused with trapezius. However, Bergman *et al.* (1988) considered the fusion of these two muscles as a normal feature. Occasionally, the muscle shows tendinous intersections in its lower part which may represent its development from several myotomes (Bergman *et al.*).

Comparative studies in mammals have demonstrated that the sternocleidomastoid muscle frequently separated into five parts which are arranged in two layers: a superficial sternomastoid, sterno-occipital and cleido-occipital part; and a deep layer consisting of a deep sternomastoid and cleidomastoid part. In humans, the presence of multiple layers such as sternocleidooccipital, cleidomastoid and sternomastoid (Coskun *et al.*, 2002), a supernumerary cleido-occipital muscle, more or less separate from the sternocleidomastoid muscle (Mustafa, 2006) have been reported. The bilateral variation of additional head in the sternal origin (Nayak *et al.*, 2006) and additional head in the clavicular origin of sternocleidomastoid have been reported (Ramesh *et al.*, 2007;

Cherian *et al.*, 2008; Rani *et al.*, 2011). The additional head observed in the present study was different from those reported by other authors as it was originated from the investing layer of deep cervical fascia. Further, the additional head was separated from the usual clavicular head by a wide triangular gap. The additional head observed in the present study probably due to the unusual splitting of the post-sixth branchial arch mesoderm (Ramesh *et al.*).

A sound knowledge of possible variations of sternocleidomastoid muscle is essentially important for head and neck surgeons, radiologists and plastic surgeons. The awareness of such variations is also important during the MR imaging of the neck region. The additional head of the sternocleidomastoid muscle can be used along with the portion

of the clavicle to reconstruct the mandible to treat the mandibular defects and can also be used as a suture line to protect the carotid and innominate arteries (Conley & Gullane, 1980).

Additional lesser supra clavicular fossa between the accessory and clavicular heads should be kept in mind while approaching the internal jugular vein for venous catheterization. Since the additional belly observed in the present study arising from the fascia in the roof of subclavian triangle, it might interfere with invasive techniques, and it may also cause the difficulties in the surgeries in this region. Surgeons can make use of these additional slips as a myocutaneous flap, in the head and neck region without disturbing the normal morphology of the muscle.

SIRASANAGANDLA, S. R.; BHAT, K. M. R.; PAMIDI, N. & SOMAYAJI, S. N. Inusual tercera cabeza del músculo esternocleidomastoideo desde la lámina superficial de la fascia cervical. *Int. J. Morphol.*, 30(3):783-785, 2012.

RESUMEN: El origen anormal, presencia de una cabeza adicional y disposición en capas de fibras son las variaciones reportadas del músculo esternocleidomastoideo. En el presente estudio, se presenta un origen poco habitual de la tercera cabeza del músculo esternocleidomastoideo en un cadáver de sexo masculino de 60 años. La cabeza supernumeraria se originaba en la lámina superficial de la fascia cervical en el techo del triángulo subclavio próximo de la clavícula y cruzaba oblicuamente hacia arriba y adelante para fusionarse con la cabeza clavicular. La inserción e inervación del músculo eran normales.

PALABRAS CLAVE: Músculo esternocleidomastoideo; Variación anatómica; Tercera cabeza.

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