



A rare variation in the origin and insertion of sternocleidomastoid muscle — a case report

Published online May 27th, 2014 © <http://www.ijav.org>

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Received January 27th, 2013; accepted September 29th, 2013

Abstract

A rare case of two additional slips in the origin of sternocleidomastoid muscle, and a varied insertion of sternocleidomastoid muscle was found during our routine dissection, on right side of the neck in an elderly female cadaver. The clinical and embryological significance of the variation is discussed. This case may be important for head and neck surgeons and for plastic surgeons doing muscle graft surgeries.

© *Int J Anat Var (IJAV)*. 2014; 7: 17–18.

Key words [sternocleidomastoid] [clavicular head] [sternal head] [additional head] [torticollis]

Introduction

The sternocleidomastoid (SCM) which is shortly called as sternomastoid extends obliquely across the side of the neck and divides the neck into anterior and posterior triangle. The SCM occupies key position since a host of important structures of neck like great vessels and branches of cervical plexus are overlapped by the muscle [1]. It takes origin by two heads (sternal and clavicular head), separated by a triangular depression known as the lesser supraclavicular fossa. The muscle is inserted to the lateral surface of the mastoid process and lateral part of the superior nuchal line. The clavicular fibers are directed mainly to the mastoid process and the sternal fibers are more oblique and superficial, and extend to the occiput [2]. The directions of pull of the two heads are different and the muscle is cruciate and spiraled [3]. The motor nerve supply of the SCM muscle is derived from spinal root of accessory nerve [4]. The proprioceptive fibers from the muscle are conveyed by the ventral rami of C2 and C3 [5]. The SCM muscle is involved in majority of the head movements and also it assists in inspiration [6]. The unknown origin and insertion of SCM, may result in spasm of the muscle, which in turn leads to a flexion deformity of the neck known as wryneck or torticollis [4]. The other muscles that rotate

and flex the neck also may contribute to torticollis. The SCM variability may cause complications in surgical procedures that access vital elements like spinal accessory nerve that related to it and minor supraclavicular fossa [3].

Case Report

While doing a routine dissection cervical region of 55-year-old embalmed female cadaver in the department of Anatomy, a rare and unusual variation in origin and insertion of SCM was noted on the right side of head and neck region. Two additional heads were arising from the deep fascia over the anterior triangle of the neck. One of the additional heads (AH1) united with the sternal fibers (I.SH1) and few fibers from its medial aspect were reflected medially and were inserted to the mandible (angle and base). The other additional head (AH2) united only with sternal head (I.SH1). The origin of sternal (SH) and clavicular heads (CH) and their insertion to the mastoid process and superior nuchal line were appeared as usual (Figure 1).

Discussion

Several variations of SCM were reported on its origin [4]. However, on the insertion site, there are very few variations

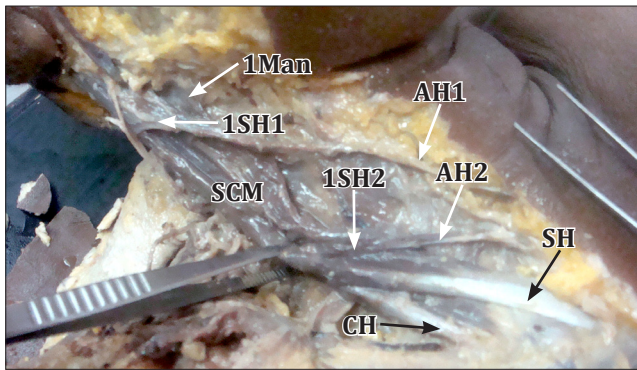


Figure 1. Superficial dissection of right side of the neck region demonstrating the variation in origin and insertion of sternocleidomastoid muscle. (*SCM*: sternocleidomastoid -muscle belly; *CH*: clavicular head of sternocleidomastoid; *SH*: sternal head of sternocleidomastoid; *AH1*: additional head unites with sternal fibers -*1SH1* and attached to the mandible -*1Man*; *AH2*: additional head joins with sternal fibers -*1SH2*)

published [7]. Sternocleidooccipital, cleidomastoid and sternomastoid muscles in the same cadaver, supernumerary cleidooccipital muscle, more or less separate from the sternocleidomastoid muscle, cleido-occipital platysma muscle and accessory head of origin from the clavicle, were reported [1, 4–6]. But the additional head (AH1) of sternocleidomastoid from deep fascia and accessory head of insertion to the angle of mandible and posterior part base of the mandible that we reported here is not found in the literature, at the best of our search.

SCM muscle variations with regard to the additional heads were reported many times in the literature, these variations might cause severe complications [7]. Physicians/surgeons should be aware of this anatomical variation in order to understand complications that can happen. The knowledge of variations of SCM of this type is important for head and neck surgeons, maxillofacial surgeons, and the plastic surgeons. The SCM can be used in several ways during surgery. It is used along with a part of clavicle to reconstruct mandible, and its defects, as a myocutaneous flap for reconstruction of the oral floor, as a suture line to protect carotid and innominate arteries and in parotid surgeries to prevent Frey's syndrome [5, 8, 9]. In the surgeries of the lower part of the neck, such variations may bring complications as the important neurovascular bundle is covered by the muscle. It may be also difficult to perform invasive techniques.

The present case of SCM variability discusses the possible embryological and genetic basis of its origin. The muscle fibers for the SCM and trapezius are derived from (Hox D4+) somatic mesoderm [3]. These fibers are connected to skeletal elements, only by post-otic neural crest derived connective tissue instead of the usual pattern to the mesodermal skeletal structure [6]. Hox D4+ somites do not attach directly on to skeletal region as done by the mesodermal muscle, but these myoblasts appear to be subjugated to neural crest derived muscle connective tissue [10]. This fact best suits to the current variation, where some fibers of this muscle were merged with the connective tissue surrounding the platysma muscle and not with the skeletal elements. In conclusion the knowledge of this variation may useful to avoid complication and to obtain ideal outcome surgical results.

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