



ADDITIONAL HEAD OF STERNOCLEIDOMASTOID MUSCLE WITH 3RD SUPRACLAVICULAR FOSSA

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ABSTRACT

The sternocleidomastoid acts as a landmark for physicians, surgeons, anesthesiologists and cosmetologists. The variability of sternocleidomastoid may cause complications while trying to access vital structures that are located in the lesser and greater supraclavicular fosse. This case study aims to present a case of additional head of the sternocleidomastoid and discuss its clinical implications. During routine student demonstration dissections, an additional head of sternocleidomastoid was observed in a male cadaver aged about 50 years. This additional clavicular head took origin 2.5cm lateral to the original clavicular head. Because of its presence, 3 supraclavicular fosse were observed. The lesser supraclavicular fossa was between sternal and clavicular heads. Greater supraclavicular fossa was divided into two by the additional head. Sternocleidomastoid with additional head are rare in the literature and may cause severe complications during interventions.

KEYWORDS: [sternocleidomastoid] [additional head]



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INTRODUCTION

The sternocleidomastoid is responsible for majority of the movements of head and is considered to be an accessory muscle of respiration (1). Normally sternocleidomastoid arises by two heads. The two heads are directed upward, separated at their origin by a triangular interval, but gradually they blend into a thick muscle and pierced by accessory nerve dividing the muscle into two parts, i.e., superficial and deep parts. It is inserted into the lateral surface of mastoid process (2). The two heads of sternocleidomastoid form with clavicle, the lesser supraclavicular fossa. The greater supraclavicular fossa is a larger depression behind the intermediate 3rd of the clavicle, between the lower parts of trapezius and sternocleidomastoid. The sternocleidomastoid functions as landmark for physicians, surgeons and anesthesiologists, who intervene in the lesser supraclavicular and greater supraclavicular fossae. The variability of sternocleidomastoid anatomy may cause complications while trying to access vital structures located in the fossae.

CASE REPORT

During the dissection of head and neck region of a 50-year-old male cadaver, additional head of sternocleidomastoid was noticed on the left side Fig(1). The additional head was 2.5 cm lateral to the clavicular head. The additional head reduced the interval between them, and significantly narrowed the lesser and greater supraclavicular fossae. The additional head divided the greater supraclavicular fossae into two. This division may cause injury to vital structures during surgical maneuvers like accessing 3rd part of subclavian artery and brachial plexus. The three heads of sternocleidomastoid proceeded upwards separately and were inserted into mastoid process as three separate slips. There was no fusion of the three bellies at any place. Accessory nerve crossed the muscle superficially and entered the trapezius.

Additional head of sternocleidomastoid

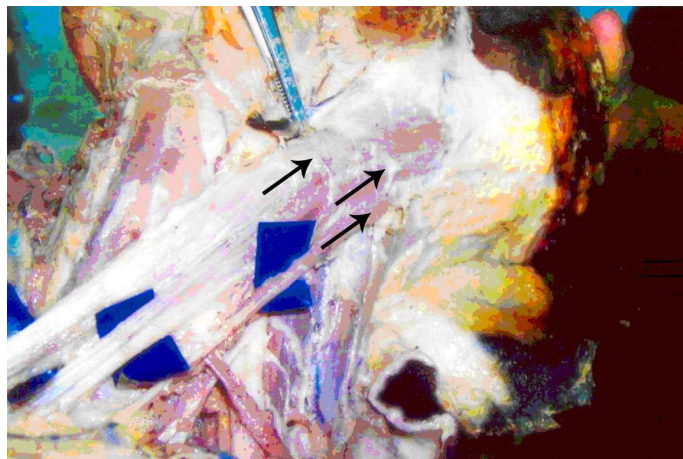


Figure 1
Additional Head of sternocleidomastoid muscle taking origin from clavicle and dividing greater supraclavicular fossa into two.

Insertion of 3 heads separately into mastoid process is also observed.

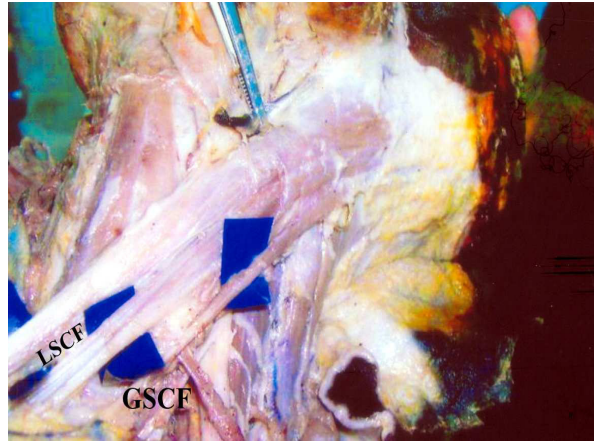


Figure 2

Lesser Supraclavicular Fossa (LSCF) Greater greater Supraclavisular Fossa (GSCF)

DISCUSSION

Sternocleidomastoid muscle variations with regard to additional head are rare. There are reports about either additional sternal or clavicular heads or bilateral clavicular heads (3, 4 & 5). Curnow (6) reported a case where the sternocleidomastoid was very irregular for its two parts were almost entirely separate, a few fibers only of the clavicular portion uniting with the sternal portion with in 2.5cm of the mastoid process. Its clavicular head was dividing into two parts by an interval of 2.5 cm wide and extending upwards for two cms. McKenzie described the sternocleidomastoid in man and in the pig where there is a portion of the muscle lying deep to or pierced by the accessory nerve contains muscle fibers of myotomic origin. These fibers represent in whole or in part, the omocervicalis which is present in most of the mammal (8). In present case there are three heads instead of two. These are proceeding separately to their insertion. As suggested by Tibinda Hasan (9); this variation can be explained by failure of mesodermal splitting during development. With an additional head of sternocleidomastoid, the lesser supraclavicular fossa was narrow and it would be difficult to locate the internal jugular vein (IJV) and cannulate it. Repeated efforts to cannulate the IJV may result in the formation of local

hematoma or even life threatening complications (1,2 & 10) The lesser supraclavicular fossa is important for anesthesiologists, during instillation of central venous line, the presence of additional clavicular head can mislead him, and the catheter may puncture the pleura leading to pneumothorax. So, surgeons and anesthetists should be aware of this anatomical variation in order to prevent complications in lesser and greater supraclavicular fossa (7). For IJV cannulation, ultrasound guidance is very useful, as the incidence of anatomical variants is as high as 8.5% (11) A myocutaneous flap including an additional head of sternocleidomastoid is of great use to the plastic surgeon because of its adequate vascularity and presence of sufficient tissue to be transferred to the recipient site(2) Occasionally, the lower portion of the sternomastoid muscle is intercepted by tendinous intersections which indicate the origin of this muscle from different myotomes. These flaps are known as superficial sternomastoid, deep sternomastoid, sternooccipital, cleidomastoid and cleidooccipital, which are arranged in superficial and deep layers. The muscle fibers of their layers lie with in a common facial sheath and traverse in the same direction.

and is helpful during muscle flap harvesting procedures. (9)

Clinical relevance and summary of sternocleidomastoid

Sternocleidomastoid is important in many ways. Its involvements in sternocleidomastoid syndrome are well established. In addition, it is useful in reconstructive procedures of mandible, oral floor, myocutaneous cervical esophagoplasty. Hence, knowledge of this muscle and presence of additional supraclavicular fossa due to the presence of

additional head is of clinical significance. It has value not only in anesthesia and surgical procedures, but also seen in cosmetic surgeries. EMG potentials recorded from sternocleidomastoid muscle in response to electrical stimulation of the spinal accessory nerve at neck for the better determination of site of lesions. This method can be useful in the evaluation of patients with amyotrophic lateral sclerosis (2). To evaluate the effect of levodopa, in Parkinson's disease electromyographic activity of sternocleidomastoid muscle studied (1).

CONCLUSION

Knowledge of variations in Sternocleidomastoid are useful in

- Rising of myocutaneous flap with additional head is useful to the plastic surgeon for cosmetic surgeries because of its vascularity and presence of sufficient tissue to be transferred to the recipient site.
- For study of EMG recordings in patients for certain disorders
- Knowledge of presence of additional head is important because it may mislead an anesthetist during installation of central venous line. If it is not noticed, catheter may puncture pleura

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