



### Cleidohyoideus Accessorius - an Additional Strap Muscle in the Neck

Cleidohyoideus Accessorius - Boyun Bölgesinde İlave İnfrahyoid Kası

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#### ABSTRACT

Variations of the muscles in the infrahyoid region assume clinical significance during diagnostic and surgical procedures in the region of neck. Accessory muscles are rare anatomical variants which may have clinical implications. The present case reports the existence of an accessory muscle, the cleidohyoid. The muscle was unilaterally observed arising from the upper surface of the middle of the clavicle and inserting into the hyoid bone. The occurrence of this muscle in the densely packed region as in the neck may have functional, diagnostic, surgical and pathological implications.

**Key words:** Cleidohyoid, infrahyoid, clavicle, hyoid bone

#### ÖZET

İnfrahyoid bölgedeki çeşitli kaslar boyun bölgesi hastalıklarının teşhisinde ve cerrahi operasyonlarında klinik açıdan önemli olduğu düşünülür. Yardımcı kaslar, klinik etkileri olabilecek nadir görülen anatomik varyantlardır. Bu vaka değerlendirmesinde cleidohyoid yardımcı kasından bahsedilmektedir. Bu kas, köprücük kemiginin orta üst yüzeyden ortaya çıkan ve hyoid kemiğe yerleşmiş şekilde tek taraflı olarak gözlemlenmiştir. Boyunda yoğun biçimde paketlenmiş bölgede ortaya çıkan bu kas, fonksiyonel olabildiği gibi teşhis cerrahi ve patolojik açıdan da önemli olabilir.

**Anahtar kelimeler:** Cleidohyoid, İnfrahyoid, köprücük kemiği, hyoid kemik.

#### INTRODUCTION

Variations of the infrahyoid muscle are common and abound in the literature. The "Cleidohyoideus accessorius muscle" is one among them and is defined as a "muscle inserting in the clavicle and the hyoid bone when the omohyoid is present".

The reports mentioning the existence of this muscle date back to the 19th century<sup>1</sup>. A more recent literature review by Sasagawa includes ten reports with mention of the cleidohyoideus

accessorius muscle<sup>2</sup>. Bergman illustrated numerous variations of accessory muscles to the omohyoid. One of these variations included a fascicle with attachments to the medial head of the clavicle and the hyoid bone<sup>3</sup>. In the present case, the existence of the cleidohyoid muscle is reported unilaterally. The muscle instead of being a narrow strip as reported previously, showed characteristics similar to the rest of the infrahyoid muscles. This observation is rare and is seldom reported.

It is interesting for the anatomists and medical students to witness the abnormal occurrence of

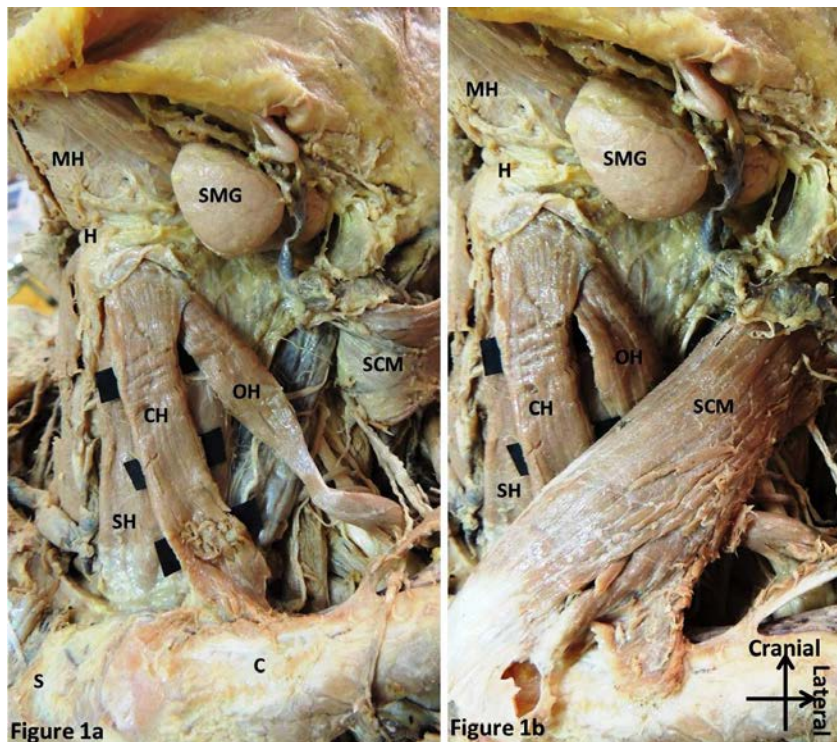
such accessory muscles. Even though these variations are normally harmless, they could interfere during surgeries. Awareness of such variations is therefore important for surgeons as it might interfere with the invasive techniques and cause difficulties in the surgeries in this region. These additional slips can be used as myocutaneous flaps in head and neck surgeries. Further this variation is also important for radiologists while interpreting MR images of this region.

### CASE

Here we report the existence of an additional strap muscle, "Cleidohyoideus accessorius", encountered unilaterally in a 65-year-old female

cadaver during the dissection of the head and neck region in the department of Anatomy, Kasturba Medical College, Manipal.

It was a flat muscle of 7.5 cm long and 2 cm wide and ensheathed with a well-developed fascia. It originated from the middle one third of the upper border of the left clavicle extending upward lateral to the sternohyoid. The muscle then inserted to the lower border of the hyoid bone along with the superior belly of omohyoid. Its shape and size were comparable to those of sternohyoid muscle. The muscle was however bulkier compared to the omohyoid (Figure 1). It had no symmetrical muscle on the right side of the neck. Its nerve supply was from the ansa cervicalis and arterial supply from the thyrocervical trunk of the subclavian artery.



**Figure 1.** Showing the accessory cleidohyoid muscle (CH).

**Figure 1a.** Showing the muscle originating from the middle one third of the upper border of the left clavicle (C) lying lateral to the sternohyoid muscle (SH). This strap muscle was about 7.5 cm long and 2 cm wide. The muscle then inserted to the lower border of the hyoid bone (H) along with the superior belly of omohyoid muscle (OH). Its shape and size was similar to sternohyoid muscle (SH) but was however bulkier compared to the omohyoid muscle (OH). The sternocleidomastoid muscle (SCM) is reflected for a better view of the strap muscles.

**Figure 1b.** Showing the relationship of the cleidohyoid to an intact sternocleidomastoid muscle (SCM). S- Sternum, MH- Mylohyoid muscle, SMG- Submandibular gland.

## DISCUSSION

All the infrahyoid muscles develop from the muscle primordium in the anterior cervical region. Initially, the muscle primordium divides into shallow and deep layers. The deep layer forms the sternohyoid and thyrohyoid muscles. The shallow layer of the primordium forms the splenius which spreads in the cervical region. Further, the splenius divides into internal and external muscles. The internal forms the sternohyoid muscle whereas the lower part of the external becomes the omohyoid muscle. The existence of an additional muscle, cleidohyoid could be attributed to the primitive morphology of the splenius and may be due to the persistence of the fetal omohyoid and the cleido-sternohyoideus<sup>4</sup>. This may be further affirmed by the present case, wherein both the omohyoid and cleidohyoid presented with a common insertion.

Existence of atypical infrahyoid muscles is common. The omohyoid is the most common muscle to have the highest incidence of variations. Unusual forms of omohyoid described by Bergman et al include: cleidofascialis, which originates from the middle third of the clavicle and inserts in to the fascia colli (neck); Cleidohyoideus, which originates behind the origin of the cleidomastoid part of sternocleidomastoid and inserts onto the body of the hyoid bone; and hyofascialis, which originates from the hyoid and inserts into the sternoclavicular fascia<sup>5</sup>.

Le Double<sup>6</sup>, and Steinbach<sup>1</sup> were the first authors to describe the existence of an infrahyoid muscle originating from the clavicle and inserting into the hyoid bone. Steinbach reviewed and categorized cases of infrahyoid muscles into four categories, one of which included muscles that originate from the clavicle and insert into the hyoid bone, in the presence of an intact omohyoid. The muscle was termed "cleidohyoideus accessorius"<sup>1</sup>. Existence of cleidohyoid in the absence of omohyoid was also reported. In that

case the inferior belly of omohyoid was absent and was associated with the unusual attachment of the superior belly to the clavicle<sup>7</sup>. The cleidohyoideus accessorius muscle has been described by a number of investigators<sup>8,9</sup>. However most of them have described the muscle as a narrow, ill-defined strip in the presence or absence of the omohyoid. In the present case the muscle was well defined, similar in characteristic to the sternohyoid and larger in morphology compared to the omohyoid.

The occurrence of an accessory muscle in the infrahyoid region may have its implications during diagnostic and surgical procedures. The existence of additional muscles is likely to have implications for the surgical management of oral and oropharyngeal cancer<sup>10</sup>. Further the knowledge of these variations are also important for harvesting muscle flap for reconstructive surgeries, to relieve the neurovascular compression symptoms and to avoid the possible complications during surgeries and other invasive techniques.

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