SHORT REPORT

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Anterior belly anomalies of the digastric muscle: case report

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SUMMARY

We report two cases of anomalous digastric muscles that were found during routine dissections of the submental region. Our first case was an 84-year old male cadaver who had bilateral and symmetric accessory anterior bellies of the digastric muscle. A unilateral accessory anterior belly of the digastric muscle with an accessory muscle bundle lying transversally between the two anterior bellies of a 60-year old male cadaver was observed in the second case. In the first case, the anterior bellies and accessory anterior bellies were attached to the mandible digastric fossa. In the second case, anterior bellies and an accessory anterior belly originated from the base of the chin and from digastric fossa and were fused at the beginning. It is important to be aware of possible occurrences of such anomalies during surgical procedures of the submental region.

Key words: Accessory muscle bundle – Anterior belly – Digastric muscle – Submental region – Variation

INTRODUCTION

The digastric muscle is located in the suprahyoid region and consists of two fleshy bellies united by an intermediate rounded tendon. It lies below the body of the mandible, and extends, in an angled form, from the mastoid process to the chin. The posterior belly, longer than the anterior, is attached in the mastoid notch of the temporal bone and passes downwards and forwards. The anterior belly is attached to the digastric fossa on the basis of the mandible close to the median plane. The two bellies meet in an intermediate tendon, which perforates the stylohyoid. It is held to the side of the body and the greater cornu of the hyoid by a fibrous loop, sometimes lined by a synovial sheath. An aponeurotic layer is given off from the tendon of the digastric muscle to the body and greater cornu of the hyoid bone. The digastric muscle may lack its intermediate tendon and is then attached midway along the body of the mandible. The posterior belly may be augmented by a slip from the styloid process or arise wholly from it. The anterior belly may cross the midline in part, and is not uncommonly more or less fused with mylohyoid (Williams et al., 1989).

The anterior belly of digastric muscle is supplied by the mylohyoid branch of the inferior alveolar nerve and the posterior belly by the facial nerve. These different supplies are of course associated with the separate derivation of the two parts of the muscle from the first and second branchial arch mesenchyme. The anterior belly of the digastric muscle sometimes receives a branch originating from the facial nerve in addition to the mylohyoid nerve (Yoshizaki, 1961; Mizukami, 1973; Williams

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et al.,1989; Kawai et al., 2003; Asami et al., 2006) and is vascularized by branches of the submental artery (Romanes, 1997).

Case report

Bilateral and symmetrical accessory anterior bellies of the digastric muscle were observed in an 84-year old Caucasian male cadaver in the first case. In a second case, a unilateral accessory anterior belly of the digastric muscle was observed in a 60-year old Caucasian male cadaver.

In the first case, the anterior and posterior bellies of the digastric muscle had their normal origin and course, and were joined by an intermediate tendon. The accessory anterior bellies originated from the digastric fossa and inserted into the hyoid bone (Fig. 1A). These accessory anterior bellies were classified as Type 2 and the posterior belly was classified as Type 1 according to De-Ary-Pires et al. (2003). The anterior bellies and accessory bellies of the digastric muscle were supplied by the mylohyoid nerve. The right and left anterior bellies were approximately 49.9 mm and 47 mm in length, and 9.2 mm and 8.8 mm in width, respectively. The right and left accessory anterior bellies were approximately 46.3 mm and 52.9 mm in length and 10.5 mm and 7 mm in width, respectively.

In the second case, the left side had an accessory anterior belly of the digastric muscle with an accessory muscle bundle lying transversally between the two anterior bellies. The anterior bellies and the accessory anterior belly of the digastric muscle were originated from the base of the chin and from the digastric fossa and were fused at the beginning. The accessory anterior belly then coupled with the intermediate tendon (Fig. 1B). There were no abnormalities on either side of the posterior bellies. The right and left anterior bellies were approximately 43 mm and 31 mm in length and 14 mm and 9.5 mm in width, respectively. The accessory anterior belly and accessory muscle bundle were approximately 34 mm and 36 mm in length and 6 mm and 10.1 mm in width, respectively.

Discussion

Variations or anomalies of the anterior belly of the digastric muscle are quite common. The digastric muscle has two bellies, of distinct embryological origin, and they may be either absent or present. When the anterior belly is present, ipsilaterally and/or contralaterally one, two, three or four bellies with extra slips may exist, and these are designated Anterior Belly Types I to IV, respectively. A rare variation is known as mentohyoid muscle also referred to as Type V (De-Ary-Pires et al., 2003). The variation of the anterior belly may be double or extra slips from this belly may pass to the jaw or the raphe of the mylohyoid muscle or decussate with a similar slip on the opposite side (Williams et al., 1989). According to Sargon et al. (1999), it is more usual to observe a unilateral variation of the digastric muscle than a bilateral one, although both bilateral asymmetric variations have been described. In con-

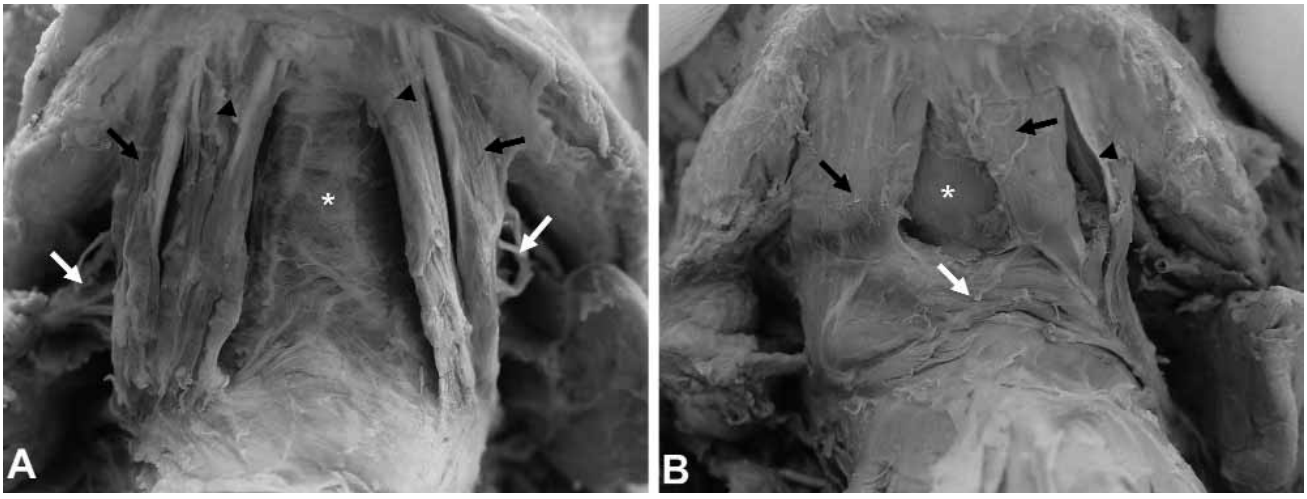

Figure 1.- A) Organization of the bellies of the digastric muscle of the first case. Black arrows: Anterior bellies of the digastric muscle; black arrowheads: accessory anterior bellies of the digastric muscle; *: Mylohyoid muscle; white arrows: Mylohyoid nerves. **B)** Organization of the bellies of the digastric muscle of the second case. Black arrows: Anterior bellies of the digastric muscle; black arrowhead: accessory anterior belly of the digastric muscle; *: Mylohyoid muscle; white arrow: Accessory muscle bundle lying transversally.

trast, in the first case the variation observed by us was both bilateral and symmetric. Ziolkowski et al. (1984) found only two bilateral variations of the anterior belly of the digastric muscle in 110 cases but did not indicate whether they were symmetric or not. The unilateral accessory anterior belly with an accessory transverse muscle bundle observed in the second case is also an atypical anomaly and is of importance for surgical procedures performed in the cervical region.

The frequencies of anomalies of the digastric muscle are not well known. However, several studies have demonstrated variations of the anterior bellies and the fibrous sling of the digastric muscle. An abnormal digastric muscle with unilateral quadrification of the anterior belly was observed by Celik et al. (2002). Sarikcioglu et al. (1998) reported an anomalous digastric muscle with three accessory bellies and one fibrous band. We also reported a bilateral but asymmetric anomaly of the anterior bellies in our previous study (Turan et al., 2004). Using MRI, Larsson and Lufkin examined the accessory bellies of the digastric muscle in 45 patients and observed a single unilateral accessory digastric muscle that crossed the midline before attaching to the contralateral digastric fossa (Larsson and Lufkin, 1987). Fujimura et al. (2003) studied the variations of the digastric muscle in 54 cadavers of both sexes and observed abnormal anterior bellies in 13 (24.1%) cases. De-Ary-Pires et al. (2003) also analyzed 146 digastric muscles from 73 cadavers, in which they found 18 (8.1%) accessory anterior bellies in all cases.

Anatomical variations of the anterior bellies of the digastric muscle could be significant during diagnostic and surgical procedures involving the suprahyoid region. Knowledge of the muscular irregularities of the submandibular region is important because mobilization of myocutaneus flaps in reconstructive procedures is an essential element in certain plastic surgery techniques (Guelfguat et al., 2001). The submental artery, a branch of the facial artery, exits from submandibular gland and continues either superficial or deep to the anterior belly of the digastric muscle. It supplies the skin of almost the entire triangle of the neck and a variable area across the midline. The submental artery flap appears to have a long vascular pedicle and is considered to be useful in facial and intraoral reconstructions. The size of the pedicle also makes it attractive as a free-tissue transfer. This flap has great clinical potential (Faltaous and Yetman, 1996). CT and MR are valuable tools in the evaluation of anatomic abnormalities and pathologic lesions of the head and neck regions. Due to its location and tissue density, an accessory digastric muscle could easily be misinterpreted as a pseudo-mass or a normal or metastatic submandibular or submental lymph node (Faltaous and Yetman, 1996).

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