The digastric muscle's anterior accessory belly: Case report

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ABSTRACT
Digastric muscle is characterized by presenting occasional variations. The suprahyoid region of an 83 year-old male cadaver was dissected and an anatomic variation of the digastric muscle was observed in its anterior belly. It consisted of an accessory bilateral anterior belly originating in the intermediate tendon and inserted into the mylohyoid raphe. The implications of this variation are discussed from a diagnostic and functional perspective.

Key words: *Digastric anterior accessory belly, mylohyoid, intermediate tendon.*

INTRODUCTION
The digastric muscle starts to form during the fourth week of embryo development. The myoblasts originated in the fourth somitomeres reach the first pharyngeal arch (Meckel arc), beginning the development of the anterior belly of the digastric muscle and the mylohyoid muscle with the mylohyoid nerve between them. Posterior belly of the digastric muscle is also formed from myoblasts migrating from the sixth somitomeres to the second pharyngeal arch (Reichert arc) (1). The anterior belly is attached to the mandible's internal surface in the digastric fossa; the posterior belly originates from the medial surface of the temporal bone's mastoid process and a deep groove between the mastoid process and the styloid process, called the digastric groove. Both bellies reach and attach the lesser horn of the hyoid bone in an intermediate tendon, going across the stylohioid ligament. The digastric muscle has complex cranio-cervical dynamics; when the infrahyoid muscles are relaxed they raise the hyoid bone during swallowing and depress the jaw when infrahyoid muscles fix the hyoid bone, they work on anterior or posterior neck flexion (2). This case report is aimed at arousing interest in the anterior accessory belly of digastric muscle variations, avoiding confusing it with tumor masses or lymphatic nodes.

CASE REPORT
A group of neck-dissection students working in the Universidad Industrial de Santander's morphology laboratory found a bilateral anatomical variation of the digastric muscle's anterior belly in one of the twenty-five cadavers dissected during the academic year (Figure 1, Figure 2).
This cadaver was an 83 year-old male. An additional anterior belly was bilaterally observed in the intermediate tendon that ran in an anteriomedial direction and was bilaterally inserted into the mylohyoid raphe. Both additional anterior bellies had a triangular configuration, having a base in the mylohyoid raphe and a vertex in the intermediate tendon. The left variation was 34.88 mm long and 14.24 mm wide. Its fibers originated in the ipsilateral digastric muscle's anterior belly in a 9.72 mm long segment and were inserted into the middle line of the mylohyoid raphe. The contralateral variation was 32.20 mm long and 9.64 mm wide and its fibers originated in the ipsilateral anterior belly in an 8.10 mm long segment, being inserted into the same place in contralateral digastric muscle. The mylohyoid nerve goes between the homonymous muscle and the anterior belly of the digastric muscle, providing additional branches to the digastric muscle's extra belly running through its deep face (Figure 3, Figure 4).

Fig. 1. The arrow points to the suprahyoid region with mylohyoid raphe. H: hyoid bone. B1: anterior belly of digastric muscle. *: accessory bellies. T: intermediate tendon. SG: submandibular gland. TC: thyroid cartilage. A: facial artery. V: submandibular vein.

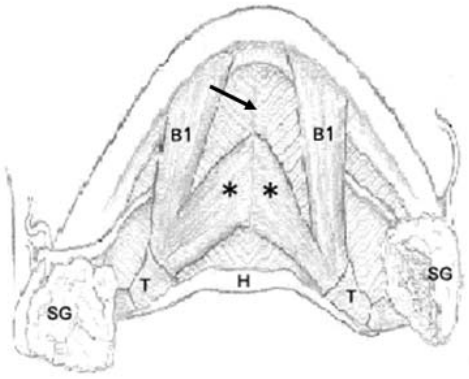

Fig. 2. The arrow points to the suprahyoid region with mylohyoid raphe. H: hyoid bone. B1: anterior belly of digastric muscle. *: accessory bellies. T: intermediate tendon. SG: submandibular gland.

Fig. 3. Intermediate tendon and digastric accessory bellies released with mylohyoid nerve branches dissected (arrows). H: hyoid bone. B1: anterior belly of digastric muscle. *: accessory bellies retracted. TC: thyroid cartilage. RM: mylohyoid raphe.

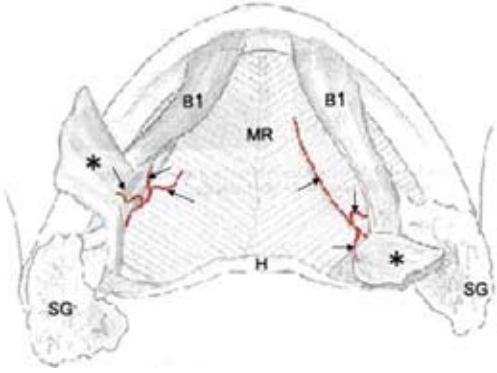

Fig. 4. Intermediate tendon and digastric accessory bellies released with mylohyoid nerve branches dissected (arrows). H: hyoid bone. B1: anterior belly of digastric muscle. *: accessory bellies retracted. SG: submandibular gland. RM: mylohyoid raphe

DISCUSSION

Digastric muscle variations began to be reported at the end of the 20th century, unilateral types being more common than bilateral ones (3,4). Several authors have reported anatomical variations in the suprahyoid region, describing them according to their location, innervation, trajectory and composition (5-18). Uzun et al. (3), reported 5.9%-53% frequency for these variations. De Ary-Pires et al. (19), classified digastric variations from 74 cadavers and described different types of variations from their posterior belly, intermediate tendon and anterior belly. Aktekin et al., described symmetric muscular bands between the muscle's two bellies. Sarikcioglu et al., showed three accessory bellies and a fibrous band being inserted into the mylohyoid raphe. Celik et al. (20-22) reported quadrification and triplication of the anterior belly in two case reports and mylohyoid-digastric muscle group variation in another.

Holibkova et al. (23), reported an anterior belly separated into medial and lateral heads which had varied trajectories and accessory bundles connecting mandible, hyoid bone and intermediate tendon crossing the middle line. Regarding innervation, Kawai et al. (24) found 0.83% prevalence among 1,078 head sides in relation to additional innervation of the anterior digastric belly coming from the stylohioid muscle's facial branch.

According to the innervation classification proposed by Sakamoto et al. (6), this variation presents digastric dominance, since the innervations were localized on the accessory anterior belly's deep face (Photo 2). This variation does not match the extensive descriptions proposed by De Ary-Pires et al. (19), making this variation a not very common presentation.

This variation's presence has implications when interpreting imagenologic studies and possibly in digastric muscle biomechanics (25). It must be carefully analyzed when interpreting

diagnostic images to avoid confusing it with tumor masses or lymphatic nodes; it should also be kept in mind during suprahyoid area surgery. In 1991 Stockstill (8) affirmed that these variations were related to unusual jaw movements; however, we believe (from a functional perspective) that their origin-insertion relationship should be remembered to understand their possible muscle-skeletal implication, such as facilitators in jaw opening movement, elevating the tongue base (during swallowing) and ventro-dorsi flexion of the head. Further statement losses functional value and becomes merely speculative. A suitable electromyography activity study may be done during different cranio-cervical-mandibular movements (26).

CONCLUSION

This case report is important in the sense that it is aimed at raising awareness of the significance of anatomical variations in body areas especially enriched with structures having different functionality which might become confused when diagnosing images and during surgery.

REFERENCES

1. Ziolkowski M, Marek J, Klak A. The human digastric muscle in the fetal period. Folia Morphol 1984;3:243-9.
2. Williams PL, Warwick R, Dyson M, Bannister LH. Gray's anatomy. 37 th ed. Edinburgh, Scotland: Churchill Livingston; 1989.
3. Uzun A, Aluclu A, Kavakli A. Bilateral accessory anterior bellies of the digastric muscle and review of the literature. Auris Nasus Larynx 2001;28:181-3.
4. Aktekin M, Kurtoglu Z, Ozturk AH. A bilateral and symmetrical variation of the anterior belly of the digastric muscle. Acta Med Okayama 2003;57:205-7.
5. Peker T, Turgut HB, Anil A. Bilateral anomaly of anterior bellies of digastric muscles. Surg Radiol Anat 2000;22:119-21.
6. Sakamoto Y, Akita K. Supernumerary muscle bundles in the submental triangle: Their positional relationships according to innervation. Surg radiol Anat 2004;26:245-53.
7. Sarikcioglu S, Demir NO, Sindel M. An anomalous digastric whit three accessory bellies and one fibrous band. Surg radiol Anat 1998;20: 453-4.
8. Stockstill JW, Harn SD, Underhill TE. Clinical implications of anomalous muscle insertion the anterior belly of the digastric muscle in a cadaver. J Craniomandib Disord 1991;5:64-70.
9. Celik HH, Aldur MM, Ozdemir B, Aksit MD. Abnormal digastric muscle with unilateral quadrification of the anterior belly. Clin Anat 2002;15:32-4.
10. Uslu SS, Atilla S, Celik HH, Inal E. An important anatomic variation in head and neck region: anomaly of the anterior belly of the digastric muscle. Bull Assoc Anat 1995;79:39-41.
11. Celik H, Yilmaz E, Atasever A, Durgun B, Taner D. Bilateral anatomical anomaly of anterior bellies of digastric muscle. Kaibogaku Zasshi 1992;67:650-1.
12. Sargon MF, Celik HH. An abnormal digastric muscle with three bellies. Surg Radiol Anat 1994;16:215-6.
13. Traini M. Bilateral accessory digastric muscles. Anat Clin 1983;5:199-200.
14. Denk CC, Aldur M, Celik HH, Basar R. A unique anomaly of the fibrous sling of the digastric muscle. Morphologie 1998;82:5-6.
15. Michna H. Anatomical anomaly of human digastric muscles. Acta anat 1989;134:263-4.
16. Guelfguat M, Nurbhai N, Solounias N. Median accessory digastric muscle: Radiological and surgical correlation. Clin Anat 2001;14:42-6.
17. Baylor JE, Wojeiech P, Lynn HL. Anomalous bilateral muscles in the submental triangle. Clin Anat 1995;8:155.
18. Norton MR.Bilateral accessory digastric muscles. Br J Oral Maxillofac Surg 1991;29:167-8.
19. De Ary-Pires B, Ary-Pires R, Ary-Pires-Neto M. The human digastric muscle: Patterns and variations with clinical and surgical correlations. Ann Anat 2003;185:471-9.
20. Celik HH, Aldur MM, Ozdemir B, Aksit MD. Abnormal digastric muscle with unilateral quadrification of the anterior belly. Clin Anat 2002;15:32-4.
21. Celik H, Yilmaz E, Atasever A, Durgun B, Taner D. Bilateral anatomical anomaly of anterior bellies of digastric muscles. Kaibogaku Zasshi 1992;67:650-1.
22. Celik HH, Yilmaz E, Atasever A Durgun B and Taner D: Observation of anomalous triplication of unilateral anterior digastric muscle. Clin Anat 1993;6:353-5.
23. Holibkova A, Machalek L. A report on anomalies of digastric muscle. Acta Univ Palacki Olomuc Fac Med 1999;142:57-9.
24. Kawai K, Koizumi M, Honma S, Tokiyoshi A, Kodama K. Derivation of the anterior belly of the digastric muscle receiving twigs from the mylohyoid and facial nerves. Ann Anat 2003;185:85-90.
25. Larsson SG, Lufkin RB. Anomalies of digastric muscles: CT and MR demonstrations. J Comput Assist Tomogr 1987;11:422-5.
26. Widmalm SE, Lillie JH, Ash MM. Anatomical and electromyographic studies of the digastric muscle. J Oral Rehabil 1988;15:3-21.