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Case Report

Anatomy Section

Aberrant Innervation of the Sternocleidomastoid Muscle By the Transverse Cervical Nerve: A Case Report

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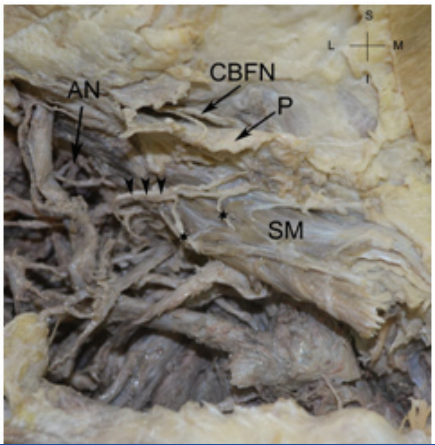
ABSTRACT

Two aberrant rami originating from the right transverse cervical nerve and innervated the midportion of the sternocleidomastoid muscle (SM) were detected during routine cadaver dissection. Although SM is commonly innervated by the accessory nerve, as well as by cervical nerves, it is likely to be innervated additionally by other nerves such as hypoglossal nerve, ansa cervicalis, facial or external laryngeal nerve. Some considerations as regards the possible composition of the aberrant rami of the transverse cervical nerve detected in the current study, as well as the relevant literature is discussed.

Keywords: Accessory nerve, Cervical nerves, Rami

CASE REPORT

During the routine cadaver dissection performed for educational and research purposes in our Department of Anatomy, we came across a variant innervation of the sternocleidoidomastoid muscle (SM). In an 82-year-old female formalin embalmed cadaver whose death was unrelated to the current study, after careful dissection of the anterior and right cervical region, we noticed the presence of two rami arising from the TCN and distributing to the posterior part of the SM's midportion. The TCN on the right side after emerging from the Erb's point coursed transversely lying on the SM's surface and giving off after a distance of 1.3 cm the first SM's ramus. The second SM's ramus was arising from the inferior branch of the TCN at a distance of 1.2 cm from the first SM's ramus. The TCN was anastomosing with the cervical branch of the right facial nerve as occurs usually, whereas the platysma at this region was partially fused with the SM's midportion. Furthermore, it must be emphasized that the right SM was innervated by the ipsilateral accessory nerve emerging from the SM's posterior border proximally, as well by cervical spinal rami not demonstrated in the current photographic documentation [Table/Fig-1]. The contralateral SM was innervated as usual by the accessory nerve and cervical nerves. No pathology, abnormalities or evidence of previous surgical procedures on the cervical region were noted.



[Table/Fig-1]: The transverse cervical nerve on the right side (arrow heads) is seen to be emerging from Erb's point of the sternocleidomastoid muscle (SM) and provided two aberrant rami (asterisks) for the SM's midportion. (CBFN: cervical branch of facial nerve, P: platysma muscle, AN: accessory nerve, S: superior, I: Inferior, L: lateral, M: medial).

DISCUSSION

The SM as it is well-known when contracted produces the "wry neck" position with the ear approaching the tip of the shoulder and the chin rotating to the opposite side. SM is innervated by the spinal part of the accessory nerve as well as the second, third and sometimes fourth cervical spinal nerves [1]. These cervical nerves are thought to be sensory and especially proprioceptive for many years, whereas it has been proved that some of these cervical nerves' fibers are motor [2,3]. SM's innervation from other sources than the common ones has been described as well. Froment very early in 1899 reported the existence of a branch arising from the external laryngeal nerve going to the SM [4], whereas Maubrac in 1883 [5] and Richer in 1922 [6] referred to a small filament from the hypoglossal nerve supplying the SM. Similarly, Koizumi et al., mentioned a branch arising from the hypoglossal nerve at the origin of the superior root of the ansa cervicalis and distributed to the SM [7]. Paraskevas et al., noticed the SM's innervation by a ramus derived from the sternothyroid branch of the ansa cervicalis [8], whilst Hegazy noted that the superior root of the ansa cervicalis gave off ramus to the SM with an incidence of 24% [9]. Hayward hypothesized that in some cases of spasmodic torticollis treated with surgical intervention, the residual movement of the neck was attributed to the existence within the accessory nerve of fibers of vagal origin [10]. Moreover, Sklavounos observed a thin twig of the cervical branch of the facial nerve supplying a small portion of the most proximal part of the SM [11], whilst Cvetko noticed an aberrant branch arising from the posterior division of the facial nerve and entering the deep surface of the SM's upper third [12].

Our study case is unique since the presence of rami originating from the TCN and distributed to the SM, to the best of our knowledge has never been reported in the literature. As it is well known the TCN derived from the second and third cervical rami, divides into ascending branches uniting with the cervical branch of the facial nerve and supplying the upper anterior areas of the neck and

descending branches distributed to the skin of the neck as low as the sternum [13]. In our case we consider that the rami from TCN supplying the SM's midportion convey mainly proprioceptive fibers. It could be possible for the TCN to transmit some motor cervical fibers to the SM. Alternative possibility could be that this nerve could convey motor fibers derived from the cervical branch of the facial nerve. Such a point of view is empowered by the fact that the SM's midportion is partially fused with the platysma muscle that is innervated by the facial nerve. Presumably, such an aberrant innervation for the SM's midportion could be attributed to its potential embryological derivement from a proximal myotome. Cvetko, likewise, claimed that the SM's innervation by the facial nerve presumably resulted by the partial fusion of the SM with the posterior belly of the digastric muscle [12], whereas Sklavounos considered such an innervation as indication of SM's superior portion derived from a more proximal myotome [11].

CONCLUSION

The comprehensive knowledge of the various patterns of SM's innervation is a necessity for the surgeon treating patients with spasmodic torticollis, especially in cases of disease's recurrence. Furthermore, such aberrant SM's innervation as described in the current study could potentially confuse the neurologist during the interpretation of the electrophysiologic control of the muscles and nerves of the region.

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