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Case Report

A rare case of formation of double ansa cervicalis

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ABSTRACT

Ansa cervicalis is a loop of nerves found in the anterior wall of the carotid sheath in the carotid triangle. The descendens hypoglossi branch of hypoglossal nerve joins the descendens cervicalis, formed by branches from the second and third cervical nerves, to form the ansa cervicalis. The ansa cervicalis nerve formation is relatively complex, as its course and location along the great vessels of the neck vary.

In the present case, on the right side of the neck of a 55 year old male cadaver we observed a rare case of formation of double ansa cervicalis, due to the variation in the course of C1 fibers. ***Neuroanatomy; 2007; 6: 26–27.***

Key words [ansa cervicalis] [hypoglossal nerve] [vagus nerve] [variation]

Introduction

Ansa cervicalis is a thin loop of nerves formed by ventral rami of C1, C2 and C3 that lies embedded in the anterior wall of carotid sheath at the level of the lower part of the larynx. It supplies the infrahyoid muscles. It is formed by a superior and an inferior root. Superior root (descendens hypoglossi) is the continuation of the descending branch of hypoglossal nerve, although its fibers are derived from C1 nerve. This root descends over the internal carotid artery and the common carotid artery. The inferior root (descendens cervicalis) is derived form C2 and C3. As this root descends, it winds round the internal jugular vein, and then continues anteroinferiorly to join the superior root in front of the common carotid artery.

Case Report

During routine gross anatomy dissection on the right side of the neck of a 55 year old male cadaver, we observed a rare case of formation of double ansa cervicalis, upon the variation in the course of C1 fibers. In general, the ventral primary rami of C1 fibers usually travel along with the hypoglossal nerve and most of the C1 fibers leave the hypoglossal nerve where it curves round the occipital artery and then descend in the anterior wall of the carotid sheath as descendens hypoglossi (upper root of ansa cervicalis). In this case most of the C1 fibers accompanied the hypoglossal nerve to descend in the anterior wall of carotid sheath as descendens hypoglossi, but some of the C1 fibers accompanied the vagus nerve and left the nerve (descendens vagi) above the origin of descendens hypoglossi. Both descendens vagi and descendens hypoglossi fibers, joined on the anterior wall of the carotid sheath immediately below the bifurcation of the common carotid artery to form the upper loop of the ansa cervicalis. From the upper loop a branch run down in the anterior wall of the carotid sheath to join with the descendens cervicalis to form the lower loop of ansa cervicalis, before joining the descendens cervicalis a branch is given to the superior belly of omohyoid. From the lower loop of ansa cervicalis branches are given of to the sternohyoid and sternothyroid muscles and to the inferior belly of omohyoid muscle. However no such variation was found in the ansa cervicalis formation on the left side (Figure 1).

Discussion

The descendens hypoglossi normally leaves the hypoglossal nerve where it curves round the occipital artery and then descends in the anterior wall of the carotid sheath. Before joining the descendens cervicalis it gives a branch to the superior belly of omohyoid. From the ansa cervicalis branches are given of to the sternohyoid, sternothyroid and inferior belly of omohyoid, another branch descends in to the thorax to join the cardiac and phrenic nerve [1].

The ansa cervicalis may arise from the first, second and third or only from the second and third cervical nerves. The descendens hypoglossi may be replaced by the vagus nerve. When no ansa is present, the innervation of the

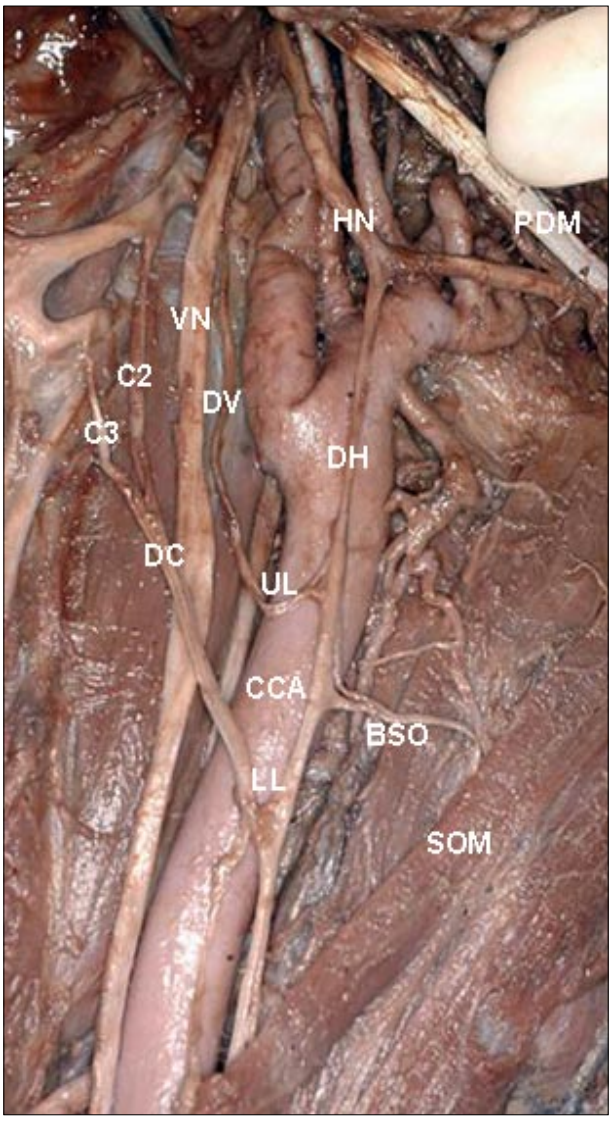

Figure 1. Formation of double ansa cervicalis embedded in the anterior wall of carotid sheath on the right side of the neck, showing superior and inferior roots and branches to the superior belly of omohyoid muscle. Color version of figure is available online. *(**PDM:** posterior belly of digastric muscle; **HN:** hypoglossal nerve; **VN:** vagus nerve; **DV:** descendens vagi (C1 fibers through vagus nerve); **C2:** C2 fibers; **C3:** C3 fibers; **DH:** descendens hypoglossi; **DC:** descendens cervicalis; **UL:** upper loop; **BSO:** branch to superior belly of omohyoid muscle; **SOM:** superior belly of omohyoid muscle; **CCA:** common carotid artery; **LL:** lower loop)*

infrahyoid muscles is by branches arising directly from C2 and C3. The nerve to the thyroid may arise as a branch of the ramus descendens hypoglossi. The phrenic nerve may also receive a contribution from the descendens hypoglossi [2].

The ansa usually may be found between the sheaths of the sternocleidomastoid muscle and the common carotid artery, superficial to the internal jugular vein; sometimes it may lie in the carotid sheath between the carotid artery and the jugular vein; rarely may it lie dorsal to both the artery and vein. Rarely the superior ramus may be associated with the vagus nerve instead with the hypoglossal. In such cases it was formerly called the descendens vagi instead of the descendens hypoglossi [3,4].

Damage to the ansa can lead to change in voice quality after some time, even though the exact reason is not known for this phenomenon, it may be because of the loss of support provided by the strap muscles to the laryngeal cartilages during the movements of vocal folds [5].

In the recent years, there has been a proliferation of techniques utilizing the ansa cervicalis nerve to reinnervate the paralyzed larynx such as nerve to nerve anastomosis using ansa cervicalis nerve transfer to the recurrent laryngeal nerve. The ansa cervicalis is used in reinnervation of larynx because of its proximity to the larynx and it is quite active during phonation. The ansa cervicalis is also used in preventing the morbidity associated with tongue hemiatrophy after facial-hypoglossal anastomosis has been reported. Even though this nerve is sacrificed there is no serious functional disturbance, therefore it is an ideal candidate for use in nerve construction in the neck [5].

The formation of the lower root (descendens cervicalis) varies greatly when compared with that of the upper root owing to the various cervical root contributions possible in its formation [1].

In the present case, it appears that most of the C1 fibers accompanied the hypoglossal nerve and leave as descendens hypoglossi and the remaining C1 fibers have joined the vagus nerve and left as descendens vagi. Exact clinical significance of the present case cannot be postulated, as there is no available literature on such variation.

References

[1] Berry M, Bannister LH, Standring SM. Nervous system. In: Williams PL, Bannister LH, Berry MM, Collins P, Dyson M, Dussek JE, Ferguson MWJ, eds. Gray's Anatomy. 38th Ed., Edinburg, Churchill Livingstone. 1995; 1258–1265.

[2] Bergman RA, Thomson SA, Afifi AK, Saadeh FA. Compendium of human anatomic variation. Baltimore, Urban & Schwarzenberg. 1988; 137.

[3] Anson BJ. Morris' human anatomy. 12th Ed., New York, Mc Graw-Hill Book Company. 1966; 1056–1057.

[4] Hollinshead WH, Rosse C. Textbook of anatomy. 4th Ed., Philadelphia, Harper & Row. 1985; 833–834.

[5] Vollala VR, Bhat SM, Nayak S, Raghunathan D, Samuel VP, Rodrigues V, Mathew JG. A rare origin of upper root of ansa cervicalis from vagus nerve: a case report. Neuroanatomy. 2005; 4: 8–9.