eISSN 1303-1775 • pISSN 1303-1783

Neuroanatomy (2005) 4: 8–9

Case Report

A rare origin of upper root of ansa cervicalis from vagus nerve: a case report

Published online 15 April, 2005 © http://www.neuroanatomy.org

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Received 17 February 2005; accepted 1 April 2005

ABSTRACT

Ansa cervicalis is a loop of nerves in the carotid triangle of neck. Its upper root is the descending branch of hypoglossal nerve, which joins the lower root that is formed by branches from the second and third cervical nerves. 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 left side of the neck of a 40-year-old male cadaver the upper root of ansa cervicalis came from vagus nerve. ***Neuroanatomy; 2005; 4: 8–9.***

Key words [ansa cervicalis] [upper root] [vagus nerve] [variation]

Case Report

During gross anatomy dissection of left side of neck of a 40-year-old male cadaver, we observed a variation in the origin of upper root of ansa cervicalis (Figures 1–2). The lower root of ansa cervicalis (Figure 1) was formed from the second and third cervical nerves, but the upper root came from the vagus. The muscular branches to sternohyoid, sternothyroid and inferior belly of the omohyoid were given by ansa cervicalis. The thyrohyoid and geniohyoid muscles were supplied by hypogossal nerve. However the ansa cervicalis nerve formation on the right side was normal.

Discussion

Normally the descending branch (descendens hypoglossi or upper root of the ansa cervicalis) leaves the hypoglossal nerve where it curves round the occipital artery and then descends in the anterior wall of the carotid sheath. After giving a branch to the superior belly of the omohyoid it is joined by the lower root of the ansa. Branches from the ansa supply the sternohyoid, sternothyroid and inferior belly of the omohyoid, another branch descends in to the thorax to join the cardiac and phrenic nerves [1].

The first cervical ventral ramus [1, 2] emerges above the posterior arch of atlas, passes forwards lateral to its lateral mass, descends anterior to its transeverse process, and joins the ascending branch of the second cervical ventral ramus. From this loop, communicating branches pass to the hypoglossal nerve, vagus nerve and sympathetic trunk. Fibres to hypoglossal nerve later leave it as a series of branches, viz. the meningeal, upper root of the ansa cervicalis, nerves to the thyrohyoid and geniohyoid.

The hypoglossal nerve [1, 2] communicates with the sympathetic trunk, vagus, first and second cervical nerves, and lingual nerve. It emerges from the skull through the hypoglossal canal in the occipital bone, and then passes downwards and laterally forming a half-spiral turn round the inferior ganglion of vagus, to which it is united by connective tissue. The vagal connections occur between the hypoglossal nerve and the inferior vagal ganglion in the connective tissue uniting them. Close to its exit from the skull near the atlas the hypoglossal nerve is joined by branches from the superior cervical ganglion and a filament from the loop between the first and second cervical nerves which leaves the hypoglossal as the upper root of ansa cervicalis, nerve to the thyrohyoid, and nerve to the geniohyoid.

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

In recent years, there has been a proliferation of techniques utilizing the ansa cervicalis nerve to reinnervate the paralyzed larynx such as neve-nerve anastomosis using ansa cervicalis nerve transfer to the recurrent laryngeal

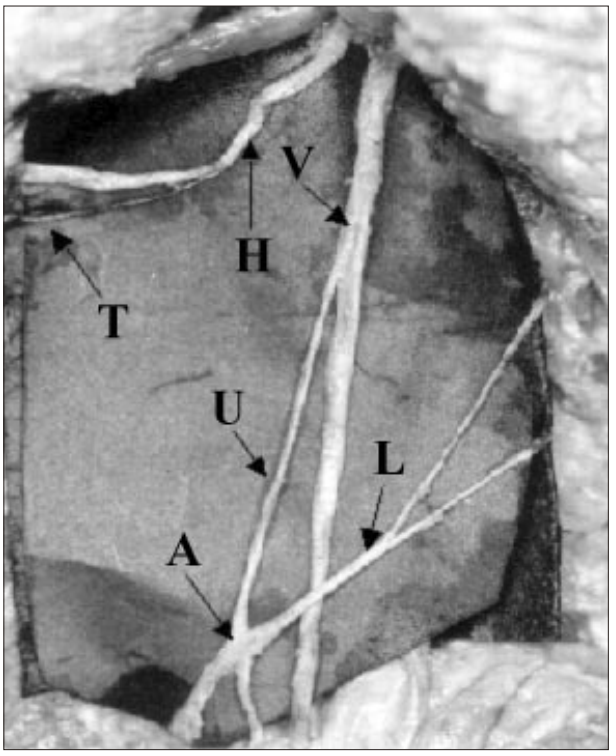

Figure 1. Ansa cervicalis on left side. Note its upper root arising from the trunk of vagus nerve. *(**V:** vagus nerve; **H:** hypoglossal nerve; **U:** upper root; **L:** lower root; **A:** ansa; **T:** nerve to thyrohyoids)*

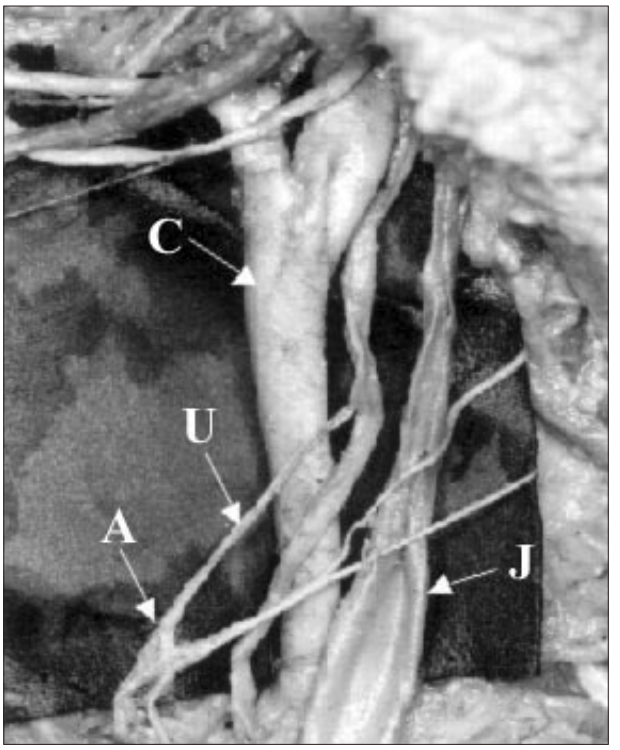

Figure 2. Relation of ansa cervicalis to large vessels. *(**A:** ansa; **U:** upper root; **C:** common carotid artery; **J:** internal jugular vein)*

nerve [3]. The ansa cervicalis is used in reinnervation of larynx because of its proximity to the larynx and it is quite active during phonation. Ansa cervicalis use is not limited to laryngeal reinnervation; the use of this nerve in preventing the morbidity associated with tongue hemiatrophy after facial-hypoglossal anastomosis has been reported [4]. Even though this nerve is sacrificed there is no serious functional disturbance. Therefore it is an ideal candidate for use in nerve reconstruction in the neck. The anatomic course and morphology of the ansa cervicalis are complicated by the variable course and location along the great vessels of the neck, as well as the significant differences observed in the arrangement of its contributing roots and regional branching patterns.

The formation of the lower root varies greatly when compared with that of the upper root owing to the various cervical root contributions possible in its formations.

In the present case, it appears that C1 fibres have joined the vagus nerve and leave as the upper root of the ansa cervicalis from the vagus nerve instead of hypoglossal nerve. Exact clinical significance of the present case cannot be postulated. There is no available literature on such variation.

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