

## Details on the topography and morphology of the lingual nerve at the level of tongue

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The lingual nerve brings at the level of tongue trigeminal sensory fibers and also sensory fibers of chorda tympani. Conventional anatomical literature deal very little with the lingual nerve morphology and topography at the level of tongue and also there are few references we could find concerning these data. Our aim was to investigate by dissections and microdissections the anatomical features of the lingual nerve at the level of tongue and to correlate our findings with the existing data. For the study we used 5 human adult cadavers bilaterally dissected and also 6 specimens tongue – pharynx – larynx drawn from adult cadavers at autopsy, according to the local acting ethical principles. The lingual nerve (LN) begins giving off its terminal branches at the level of the anterior border of the hyoglossus muscle (HM), when turning around the submandibular duct of Wharton. We encountered 2 morphological types of terminal division of the LN: a) a single primary trunk (50%); b) two primary trunks (50%), one medial, distributed in the middle third of tongue and other lateral, for the anterior third of tongue. No matter the morphological pattern, the terminal branches of the LN were located on the outer surface of the genioglossus muscle (GM), at the inner border of the inferior longitudinal muscle of tongue, forming a nervous layer over the lingual artery (the deep artery of tongue, N.A.). From the primary trunk(s) were leaving 2 groups of branches: a) thin and anastomosed branches for the ipsilateral mucosa of the ventral surface of tongue, configuring a veritable plexus at that level and also distributing at the level of the lateral border of tongue; b) 4 – 9 thick secondary trunks, emerged “in palisade” from the primary trunk(s), with intralingual course that followed the outer surface of the genioglossus muscle towards the dorsal mucosa of the ipsilateral part of tongue, anterior to the circumvallate papillae. That intralingual course of the LN branches is not reflected by any reference we investigated. The distal secondary trunk was sending distinctively a thin branch distributed in the mucosa of the ventral side of the tip of tongue. A specimen presented a branch distally emerged from the left LN that coursed beneath the mucosa of the tip of tongue and distributed in the mucosa of the right border of the tip of tongue. The central tongue carries a paucity of surgically significant lingual nerve fibers. LN-to-LN anastomoses were evidenced and also LN-to-hypoglossal anastomoses were found: a) the loop of the anterior border of the HM was always linking the first emerged branch of the LN to the 12<sup>th</sup> cranial nerve: to its main trunk, to the styloglossus nerve or to the first or second ascending hypoglossal branches of the 12<sup>th</sup> nerve; b) anastomoses on the GM. The hypoglossal loops connecting the LN and the hypoglossal nerve may be involved in the lingual – hypoglossal reflex but this must be studied electrophysiologically. In conclusion: (a) anatomical dissection is a reliable method of investigation for the nervous organisation of tongue, at least comparable to more elaborated technique; (b) the lingual nerve terminal branches respect the circumvalate papillae so the sintagm “distributed to the presulcal part of the tongue” must be carefully considered; (c) on the hyoglossus muscle individual patterns of the anastomoses between the lingual and hypoglossal nerves can be recognized; (d) on the genioglossus muscle there are three superposed layers: that of the lingual nerve branches, that of the deep artery of tongue and that of the hypoglossal nerve branches; (e) on the dorsum of tongue the lingual nerves respect a broad longitudinal median area that is rather poorly supplied with consistent nervous branches; (f) to describe the course of the lingual nerve as being “along the lateral border of tongue” it may appear as an undocumented statement; (g) knowledge of the topographical pattern of nerves in the trigeminal tongue serves to avoid iatrogenic injuries and to facilitate surgical procedures at that level.

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