

Variation anatomy of carotid bifurcation and branching pattern of external carotid artery

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Detailed knowledge of various anatomy is important for design of surgical treatment, especially in selection between carotid endarterectomy and carotid stenting. The knowing of variation of branching pattern of external carotid artery may prevent hypoglossal nerve injury during ligating in the neck and head regions.

The aim of this study is to summarize the data on subject of common carotid artery bifurcation and branching pattern of external carotid artery to show the clinical importance of such information in surgical treatment.

A literature searching and analyzing were performed in Pubmed, Google Scholar, Scopus database, including studies published from last 8 years.

The studies showed the position of carotid bifurcation at C3-C4 intervertebral disk level or the superior border of thyroid cartilage (50-60% right side and 40-55% left side). The common carotid artery may bifurcate higher than usual, at the level of C2 (2,3-10% both sides). The hypoglossal nerve and mandibular branch of facial nerve are injured in 5,2% cases with high carotid bifurcation level.

The strongest indications for carotid artery stenting instead of carotid endarterectomy are high carotid bifurcation, operated neck for other reasons and restenosis after previous endarterectomy.

The low carotid bifurcation (lower than C5 level, in 3,5-7,5% cases) is very rare and has not received any attention from surgeons.

The branching pattern of external carotid artery shows some variations: 1) the external carotid artery may be absent bilaterally or unilaterally; 2) linguofacial trunk was reported in 20% cases; 3) bilateral maxillofacial trunk was reported in a few cases; 4) thyrolingual trunk was observed in 2,5% cases; 5) occipitoauricular trunk-in 12,5% cases; 6) in a few cases- arising of ascending pharyngeal artery from carotid artery bifurcation instead of posterior aspect of external carotid artery was observed.

The level of carotid bifurcation is important for diagnostic and interventional vascular procedure such as endarterectomy, stenting and embolization in head and neck region.