Clinical Significance of Aberrant Internal Carotid Artery at Pharyngeal Level

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INTRODUCTION

The anatomic variations of the internal carotid artery (ICA) can be found in 5% to 8% of the general population. Otolaryngologists frequently manipulate pharyngeal area in simple pharyngeal procedures, such as tonsillarlectomy, adenoidectomy, or otomycologic surgery. Aberrant course of ICA at pharyngeal level may lead to these simple operation to fatal outcome. The objective of this study is to measure the average distance of the ICA from the pharyngeal wall and analyze the relationship between the distance and the anatomic of the patients.

METHODS AND MATERIALS

The course of the ICA was evaluated in 511 patients using retrospective chart review from January 2009 to August 2009. The vessel’s course was evaluated using computed tomography (CT) angiography. The ICA course was classified into 3 parts, nasopharynx, oropharynx, and hypopharynx. The presence or absence of ICA with kinking shape or kinking appearance was defined as abberant ICA and the pharyngeal wall was measured out by CT angiography. The number of abberant ICA was the highest. There was a correlation between hypertension(0.037), diabetes(0.0274), polycystic ovary syndrome(0.0274) and aberrant ICA. The age was in proportion to the distance between ICA and pharyngeal wall(0.0145).

Conclusion: This anatomic variations of the internal carotid artery (ICA) should be recognized to prevent possible fatal hemorrhages during the simple pharyngeal procedures.

DISCUSSION

The awareness of the average distance from ICA to pharyngeal wall is essential for otolaryngologist. ICA abnormalities in the parapharyngeal space were not rare (30% in previous study). We defined aberrant ICA at pharyngeal wall is located abnormally close to pharyngeal wall within 10 mm (DIP-10).

According to our definition, the incidence of aberrant ICA was 13.1%. Deutsch et al reported that the distance between tonsillar fossa and ICA approaches 25 mm with growing age. In our study, the average DIP at oropharyngeal level was 18.1 ± 5.4 mm and DIP-10 was most commonly found at oropharyngeal level (5.8%), which is similar to the results of other researchers.

The mean DIP for entire level of pharynx was 17.3 ± 4.3 mm, with narrowest DIP (16.7 ± 4.1 mm) at NP level (Table 1). The incidence of DIP-10 (13.1%) through entire pharyngeal level was less frequently found at HP (3.8%) compared to NP & OP level (5.0%, 5.4%, and 6.4%, respectively). The incidence of DIP-10 was significantly different (P=0.016).

Accompanying diseases such as DM or hypertension were not related with the rate of DIP-10. ICA with kinking appearance was observed at 15 sides (1.6%) of the patients and it was not associated with ICA close to pharyngeal wall (P=0.32). Atherosclerosis in cervical ICA was found in 80 sides (7.8%) and was related with the occurrence of DIP-10 (P=0.05) (Table 5). The incidence of aberrant ICA was higher in patients with hypertension, diabetes, bulging and atherosclerosis (Table 2).

The age was in proportion to the distance between ICA and pharyngeal wall(0.0145). There was a correlation between hypertension(0.037), diabetes(0.0274), polycystic ovary syndrome(0.0274) and aberrant ICA. The incidence of aberrant ICA was 13.1%. Hence, patients with hypertension, diabetes, bulging and atherosclerosis are at high risk of ICA injury on pharyngeal surgery.

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