LECTURE

Infratemporal Fossa Approaches to the Lateral Skull Base

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Abstract. The infra-temporal fossa approach is one of the lateral approaches to the skull base. It is indicated for the treatment of tumors such as glomus tumor, petrous apex cholesteatoma, chondroma, lower cranial nerve neuroma and nasopharyngeal cancer. In the present paper, we described the surgical anatomy of the lateral skull base and the indications for the infra-temporal fossa approach with its variants. We showed the hints and pitfalls in the procedures. Five illustrative cases are also presented. (Keio J Med 48 (4): 189–200, December 1999)

Key words: infra-temporal fossa approach, lateral skull base, temporal bone

Introduction

The infratemporal fossa approach with its variants (A, B, C, D) is one of the lateral approaches to the skull base.[1–5] These approaches are mainly applied for a variety of lesions invading and destroying the lateral skull base. The different types (A, B, C, D) are indicated for the treatment of tympanojugulare tumors class C, petrous apex cholesteatoma, chordoma of the clivus, extradural neuromas of the trigeminal branches and for pathology of the rhinopharynx with lateral extension to the infratemporal and pterygo-palatine fossa. The infratemporal approaches are versatile procedure that can be combined with other lateral approaches (translabyrinthine, transcochlear) for removal of massive lesions (meningiomas, chordomas, glomus jugulare tumors) invading the temporal bone and jeopardizing the intratemporal course of the internal carotid artery.

Type A Infratemporal Fossa Approach

The key point in this approach is the anterior transposition of the facial nerve, which provides optimal control of the infralabyrinthine and jugular foramen regions, as well as the vertical portion of the internal carotid artery (Fig. 1).

Surgical anatomy

The mastoid segment of the facial nerve is centered on the jugular bulb; in 60% of cases, half or more of the bulb lies anterior to the vertical plane of the nerve. When they exit from the skull base, the glossopharyngeal nerve is the most lateral, while the hypoglossal nerve is most medial. It turns inferiorly to run together with the tenth nerve for a short distance in the upper neck. The glossopharyngeal nerve is seen crossing the internal carotid artery anteriorly. More inferiorly, the hypoglossal nerve crosses the artery to go towards the tongue. The vagus nerve is seen coursing between the internal jugular vein and the internal carotid artery. The accessory nerve crosses the lateral surface of the internal jugular vein and travels posteriorly. In half of the cases, the accessory nerve crosses medial to the internal jugular vein. In all cases, it passes anterolateral to the transverse process of atlas. There is a close relationship between the vertebral artery and the internal jugular vein.

Glomus tumors with considerable extension into the neck may well involve the artery. The styloid process and its muscles separate the external carotid artery laterally from the internal carotid artery medially. The condilar emissary vein drains into the jugular bulb in 70% of cases, and the vein often has an intimate relation to the lower cranial nerves (X–XI) at their exit from the jugular foramen. After its origin from the external carotid artery, the occipital artery runs backwards, lateral to the internal jugular vein and the accessory nerve in the neck. The internal carotid artery angulates medially at its ingress into its bony canal at the skull base. The jugular bulb curves laterally before its exit into the neck to form the internal jugular vein.

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