

## The Treatment and Reconstruction of Lateral Skull Base Lesions

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### Introduction

In the past five years, many patients with neurotology and lateral skull base disease were treated in our department, including tumor, facial nerve palsy, cerebrospinal fluid otorrhea, etc. and some papers had been published according to the experience of our team [1-3]. I would like discuss this interesting problem with the aid of this journal.

The anatomical structure of the lateral skull base is very complicated, that supports the brain upwards and connects the neck downwards and a large number of important structures pass through the region, including facial nerve, carotid artery, bulb of jugular vein, dura and the inner ear. The lesions in the area of the lateral skull base mainly include tumors, chronic inflammation and trauma such as acoustic neuroma, intracranial and extracranial complications of otitis media, facial paralysis or cerebrospinal fluid leakage otorrhea resulted from temporal bone fracture. The lesions of the Lateral skull base may damage the bone structure of the skull base and destruct the closed cranial cavity even invade intracranially. The blood vessels, nerves, hearing and vestibular organs can be affected. The serious consequences resulted from the above damage include massive hemorrhage, cerebrospinal fluid leakage otorrhea, facial paralysis even intracranial complications.

At present, the surgical treatment is the main method for the lateral skull base lesions [4]. Because of the much important structures passed through the region, the selection of the surgical approach and appropriate reconstruction methods is very important to remove the lesion and improve the prognosis.

The selection of surgical approach mainly depends on the pathological character size and the location of the lesion, the relationship of the important structure with the lesion including facial nerve, blood vessel, inner ear. The general surgical approaches for lateral skull base lesions excision include: (1) The transpetrosal approaches, such as translabyrinthine approach, translabyrinthine-transapical approach, transcochlear approach, pre-sigmoid-retrolabyrinthine approach, petrosectomies (lateral, sub-total, total), infratemporal approaches, petro-occipital-transigmoid approach, and so on; (2) Sub-temporal extradural approaches and (3) Suboccipital approach or retrosigmoid approach [5].

Due to the special localization of lateral skull base lesions, impairments of important vascular, nerves, auditory organs as well as the skull base bones, even dura and intra-cranial tissues can be severely impaired. Not only the lesions should be removed in the treatment of these lesions, but also the vital organs and tissues should be protected.

The mixture of hydroxyapatite, titanium mesh, and autologous fat used for the reconstruction of the skull base can achieve good results

[6]. However, a review on paediatric craniofacial reconstruction with some synthetic materials such as hydroxyapatite showed that 59% patients had delayed infection and the materials had to be removed [7]. Autologous fat and muscle fascia are usually used to repair the small skull base defects, which has the advantage of low cost, easy access, good self-compatibility and can be used to fill the dead space at the same time, while local flap or free flap transplantation can be used for large-range defects [8].

A closed environment of the cranial cavity is very important to prevent intracranial complications in lateral skull base surgery and the important blood vessels (such as carotid artery), nerve function (such as facial nerve) and the skull base defects (such as bone defects, dura defects) should be reconstructed. Individualized selection of surgical approach and the methods of skull base reconstruction to protect important blood vessels, nerves, auditory organs and brain tissues during the operation are key points to remove the lesions and achieve a good prognosis after lateral skull base surgery [9].

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