

Research Article

Three Subtypes of Trigeminal Schwannoma in Relation with Meninges Pattern for Surgical Consideration: Anatomy and Histological Study

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- Meninges
- Surgical consideration

Abstract

Background: Trigeminal schwannomas may originate from the root, the ganglion, or the peripheral branches of the trigeminal nerve. Trigeminal schwannomas are rare tumors that comprise of 0.2% of all intracranial tumors.

Objective: To clarify the pattern of trigeminal schwannomas in relation with meninges for surgical considerations.

Methods: We used 3 adults head cadaver specimens were used for surgical simulation and taken for immunohistochemical staining to observe the meninges pattern and applied in surgical technique.

Results: This was confirmed qualitatively with Masson's Trichrome staining for collagen and elastin for the cranial dura. In our study we found that the dura wrapped the trigeminal nerve from the beginning of gasserian ganglion which change into interdural space. It becomes periosteal dura after passing through the foramen, we call it extracranial part. The Myelin basic protein staining shows the nerve filament which covered by pia mater at the root entry zone. The arachnoid clearly covers the nerve bundle from entering Meckel cave and becoming perineurium in the interdural space. At the extracranial part the nerve filament or bundle is only covered by periosteal dura or similar to epineurium structures.

Conclusion: From our discussion get conclusion for surgical method, that is 1. We did surgery sub arachnoidal dissection in posterior fossa, 2. submeningoperiosteal dura dissection in middle fossa 3. subperiosteal dissection in infra temporal fossa.

INTRODUCTION

The trigeminal nerve is the largest and most complex of the 12 cranial nerves (CNs). It supplies sensations to the face, mucous membranes, and other structures of the head. It is the motor nerve for the muscles of mastication and contains proprioceptive fibers. It emerges from the ventrolateral surface of the pons and runs anteriorly for 1–2 cm [1,2] through the cerebellopontine cistern to reach the petrous apex. Vascular structures such as the petrosal vein and the superior cerebellar artery lie close to the trigeminal nerve. Over the petrous apex, 7 mm from the medial lip of the internal acoustic meatus, [3] the Gasserian ganglion is

enveloped by a dural deflection forming the Meckel cave, which is present lateral to the cavernous sinus and the carotid artery. The Meckel cave was observed as the space between the meningeal layer and the periosteal layer of dura, which appeared to be tightly attached to the petrous apex. The trigeminal ganglion, postganglionic trigeminal roots, and subarachnoid cistern were identified within the Meckel cave. The width of the oval-shaped Meckel cave corresponded to the mediolateral diameter of the trigeminal ganglion and its length corresponded to the distance from the anterior edge of the trigeminal ganglion to the trigeminal porus. At its superior limit, the Meckel cave was in close proximity to the cavernous sinus. It almost reached the floor of the middle