

Vestibular Schwannoma Microsurgery Through Retrosigmoid Approach - How to Avoid Postoperative Non-neurologic Complications and Infection

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Introduction

Cerebrospinal fluid leak (CSFL) and subsequent intradural infection represent common complication after vestibular schwannoma (VS) surgery. The main problem is realistic watertight closure of dural incision. The aim of the work was to show the effective closure of all CSFL in the immediate postoperative period and minimally invasive method for its management and prevention of all infectious complications.

Methods

All diagnosed lateral variants of CSFL with epidural CSF collection were managed with puncture, complete aspiration with or without tissue glue injection, and wound compression (Fig., 1 and 2). Medial variant of CSFL were managed with reoperation.

There was a retrospective analysis of all 333 patients undergoing retrosigmoid-transmeatal (RSA) sporadic VS microsurgery between 1997 and 2012 (90% grade III and grade IV tumors; all but 1 case were radically removed). During the surgery drilled internal auditory canal and opened pneumatic system of temporal bone were sealed with muscle plug and tissue glue. Dura was closed first. Bony flap and pate were used for craniotomy defect closure. Cefalosporin 3rd generation were used perioperatively.

Results

Lateral variant of CSFL with epidural CSF collection occurred in 208 cases (62,5%). 208 cases had puncture, aspiration with eventual tissue glue injection (84 cases, 1-6 applications) and wound compression (Fig. 2). Medial variant of CSFL occurred in 2 cases (0.6%) and were managed with wound re-exploration and CSFL sealing. During the period of 1-15 years none of the 333 operated patients had wound, intracranial infection or meningitis.

Conclusions

Postoperative infection in case of VS RSA microsurgery is avoidable in the vast majority of cases. The relatively conservative management of lateral CSFL with postoperative puncture, complete aspiration and tissue glue injection into the pseudomeningocele solves this problem (Fig. 2). It does not need any lumbar drainage, shunts or wound revision. Only the rare medial variant of CSFL needs surgical intervention for its management.

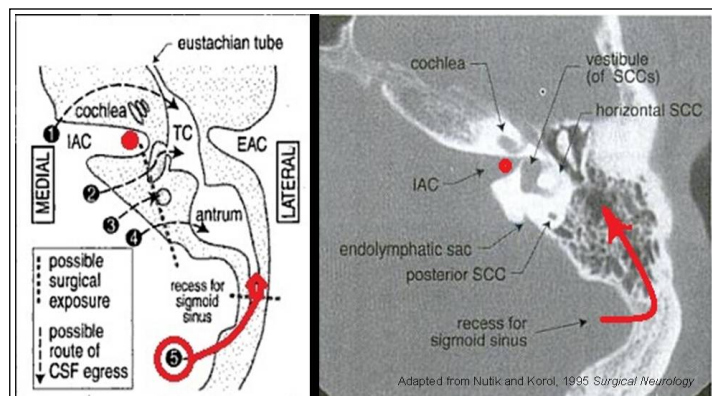


Fig. 1. Routes for CSFL and intradural infection following VS surgery through retrosigmoid approach.

Medial (intradural, internal auditory canal - IAC) route:

- 1) via the apical cells to tympanic cavity (CT) to the Eustachian tube
- 2) through the vestibule of the horizontal semicircular canal (SCC)
- 3) through the posterior SCC
- 4) through the perilyabyrinthine cells

Lateral (extradural) route:

- 5) through the mastoid air cells at the craniotomy, durotomy site

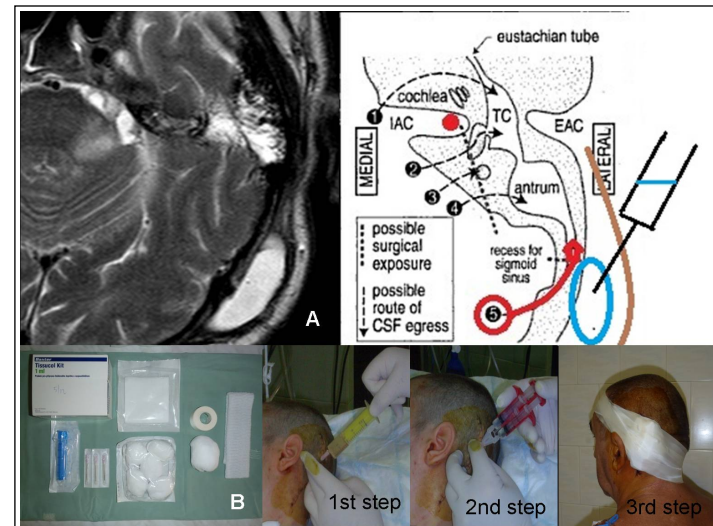


Fig. 2. Definitive treatment of lateral variant of CSFL with epidural CSF collection. A: MRI and scheme of lateral variant of CSFL with epidural CSF collection (pseudomeningocele) and its management. B: Technique of its definitive management with materials used, 1st step: total aspiration of pseudomeningocele, C: 2nd step: epidural instillation of tissue glue, D: 3rd step: compressional bandage.

References

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