

Introduction

Idiopathic trigeminal neuralgia (TN), glossopharyngeal neuralgia (GN) and hemifacial spasm (HFS) are usually sustained by a neurovascular conflict (figure 1). Microvascular decompression (MVD) is a non-ablative surgical procedure designed to resolve these neurovascular conflicts in the cerebellopontine angle (CPA).

Today endoscopy has widely spread and it is considered an essential tool in the armamentarium of the neurosurgeon.

This study aims to assess the usefulness of endoscopy during MVD procedures.

During the oral communication, videos will be presented showing the three techniques (fully microscopic, fully endoscopic and microscopic endoscope-assisted) described.

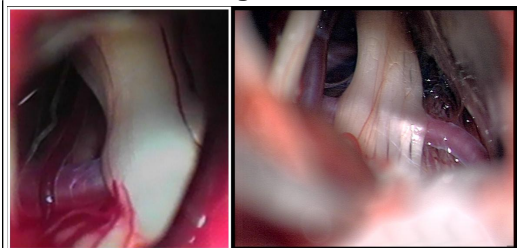


Figure 1

Intraoperative images during MVD for TN showing the neurovascular conflicts.

Methods

Between January 2010 and December 2011, 93 MVD procedures were performed (76 for TN, 17 for HFS). Before starting the procedure, the main anatomical landmarks are drawn on the skin, then a small elliptical craniectomy (figure 2) is usually performed. Gentle CSF leakage allows to open the CPA without any brain retraction. The procedure always included a careful examination of the whole nerve course to identify possible sites of vascular compression. The visualization techniques used were: fully microscopic in 59 (63.5%) cases and fully endoscopic in 8 (8.5%) cases. In the remaining 26 (28%) cases, when the conflict was not clearly identified under microscopic view or it was not certainly resolved, the endoscope was then introduced, thus using a combined microscopic/endoscopic technique.

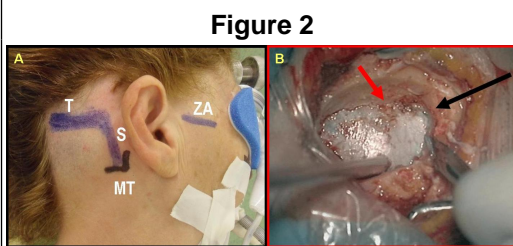


Figure 2

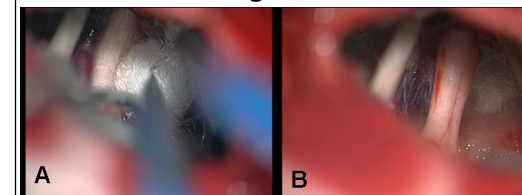
A: The main anatomical landmarks are drawn on the skin. (T: Transverse sinus. S: Sigmoid sinus. MT: Mastoid tip. ZA: Zygomatic arch.) B: Left side approach. The craniectomy is completed and the dura mater is exposed. The black arrow points the transverse sinus and the red arrow points the sigmoid sinus.

Results

In this series no permanent surgical related neurovascular complications occurred. A neurovascular conflict was found in 86 (92.5%) cases. The microscope or the endoscope alone were able to show the conflict in all 67 cases, respectively in 59 and 8 cases. In the 26 microscopic endoscope assisted cases, the endoscope revealed 10 conflicts previously not clearly visible with the microscope and confirmed a complete conflict resolution in 9 cases. Seven patients had no intraoperative evidence of neurovascular conflict. The neurovascular conflict was usually resolved through a non-compressive technique by means of tiny ball shaped pieces of oxidized regenerated cellulosa (Tabotamp, Ethicon, Johnson and Johnson, NJ, USA) placed, with or without 0.5 ml of fibrin glue, to retain the vessel in its new position (figure 3).

During combined procedures, the introduction of the endoscope under microscopic magnification decreases the chances of damaging the neurovascular structures of the CPA. This increases the confidence of the surgeon with the endoscopic technique, shortening the learning curve with this tool. Conversely, the fully endoscopic approach requires more experience and training; sometimes it is also necessary to perform a wider craniotomy to allow enough room for the endoscope and for surgical instruments.

Figure 3



Same case of figure 1, right side; example of conflict resolution with trigeminal nerve decompression. A tiny ball shaped piece of oxidized regenerated cellulosa (Tabotamp) is being inserted between the nerve and the artery. B End of the procedure; the nerve is now free from any contact. The artery is kept away by the Tabotamp. Note that a vein which was also compressing the nerve (superior part) has been coagulated and cut.

Conclusions

MVD under microscopic view remains the treatment of choice for neurovascular conflicts in the CPA. The endoscope is a useful adjunctive imaging tool in confirming neurovascular conflicts identified by the microscope, revealing conflicts missed by the microscopic survey alone and verifying adequate nerve decompression.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Identify in which cases and when the endoscope can and should be used. 2) Understand the advantages and the risks of using the endoscope in such a delicate region.