



The combined Microscopic- Endoscopic technique to increase resectability of the CPA tumors

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Introduction

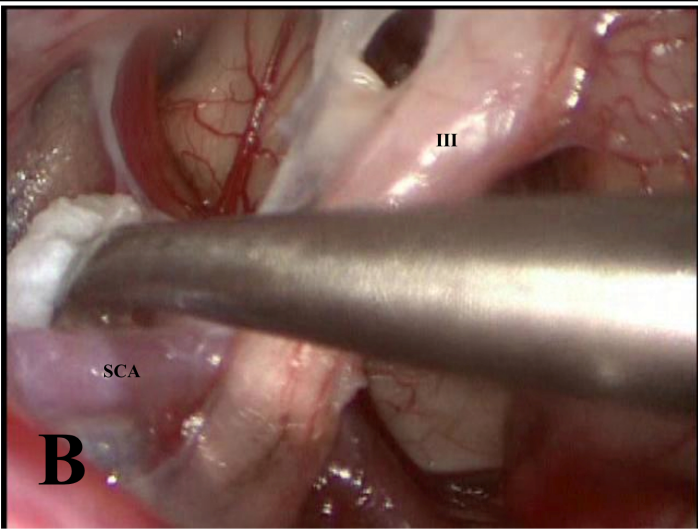
Endoscopic techniques in CPA surgery have been applied mainly in the context of *minimally invasive surgery*. Endoscopic assisted CPA surgery is beneficial in exploring and resecting hidden pieces of the tumor in the CPA, however, the use of endoscope alone has many drawbacks; mainly injury of the crowded CPA structures behind endoscopic camera and inability to explore the whole CPA or cross the midline or to the middle fossa when small craniotomies are utilized. We report here on a technique that utilizes the use of the endoscope in CPA surgery in simultaneous visualization with the microscopic view, in the different skull base approaches to the CPA, in the aim of maximizing the radicality of tumor resection and avoiding the drawbacks of CPA endoscopic assisted surgery



A, room setup for the combined technique showing the surgeon is working under simaltenous viewing of the microscopic and endoscopic HD screens

Learning Objectives

- Evaluating the reliability of the microscopic resection under the endoscopic exploration
- Evaluating the sensitivity of endoscopic view by the postoperative MRI.



B, endoscopic vieiw shows how the use of endoscope is useful in extending the retrosigmoid approach to the middle fossa through the incisura in a case of giant CPA Epidermoid

Methods

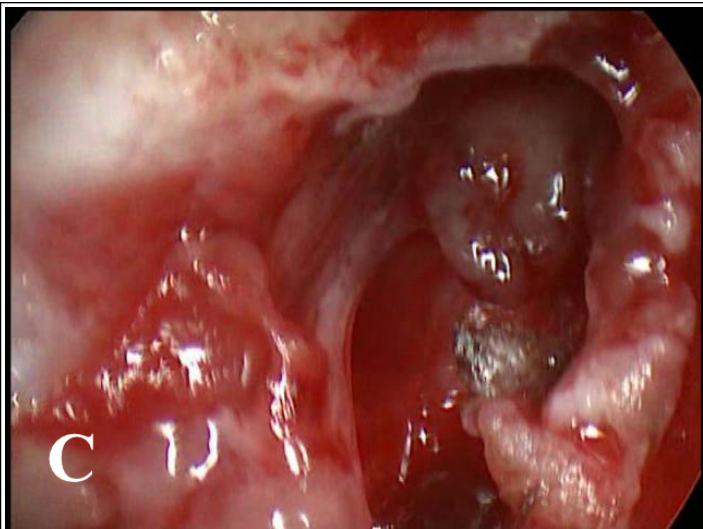
we conducted a retrospective anaysis of 50 cases, operated by this technique for resection of different types of CPA tumors (Epidermoid, Meningioma, Schwanomma, Chordoma) We utilize three hands techniques so the surgeon freely performs the dissection under the endoscopic screen. We recorded the endoscope use; as extending the approach, discovering hidden pieces of tumors, preserving the neural structures, removal of the microscopically unreachable tumor and confirmation of total removal. The extent of microscopic resection was categorized into (STR), (NTR), and microscopic total removal (MTR), these all re-evaluated after introducing the endoscope. Endoscopic verified total removal (EVTR), means no any residual at the end of surgery, postoperative MRI was used to evaluate the endoscopic view.

Results

In 26 cases, resection was considered total with the use of the microscope only (MTR). Eighteen (69.23%) of them showed residual tumor after using the endoscope. Further dissection of endoscopically visualized residuals was attempted in 34 cases. in 30 of them (EVTR) was achieved. The total No. of (EVTR) was 38, from which the post operative MRI was totally clear in 31 cases (81.5%) and showed small residual tumor, (less than 5mm) in any diameter, in only 2 cases. Five cases showed postoperative enhanced changes. In this series, no direct mechanical injury to the CPA structures happened during this technique.

Conclusions

The simultaneous use of endoscope in combination with microscope increase the extent of CPA tumor resection and minimize the risks of injury to CPA structures. Also the endoscopic evaluation of the degree of resection is highly sensitive comparable to the postoperative MRI images.



C, a microscopically hidden piece of tumor in a case of V. Schwannoma has been discovered and remove by the endoscope.