Keyhole retractorless retrosigmoid approach for large vestibular schwannoma – Surgical technique and facial nerve preservation

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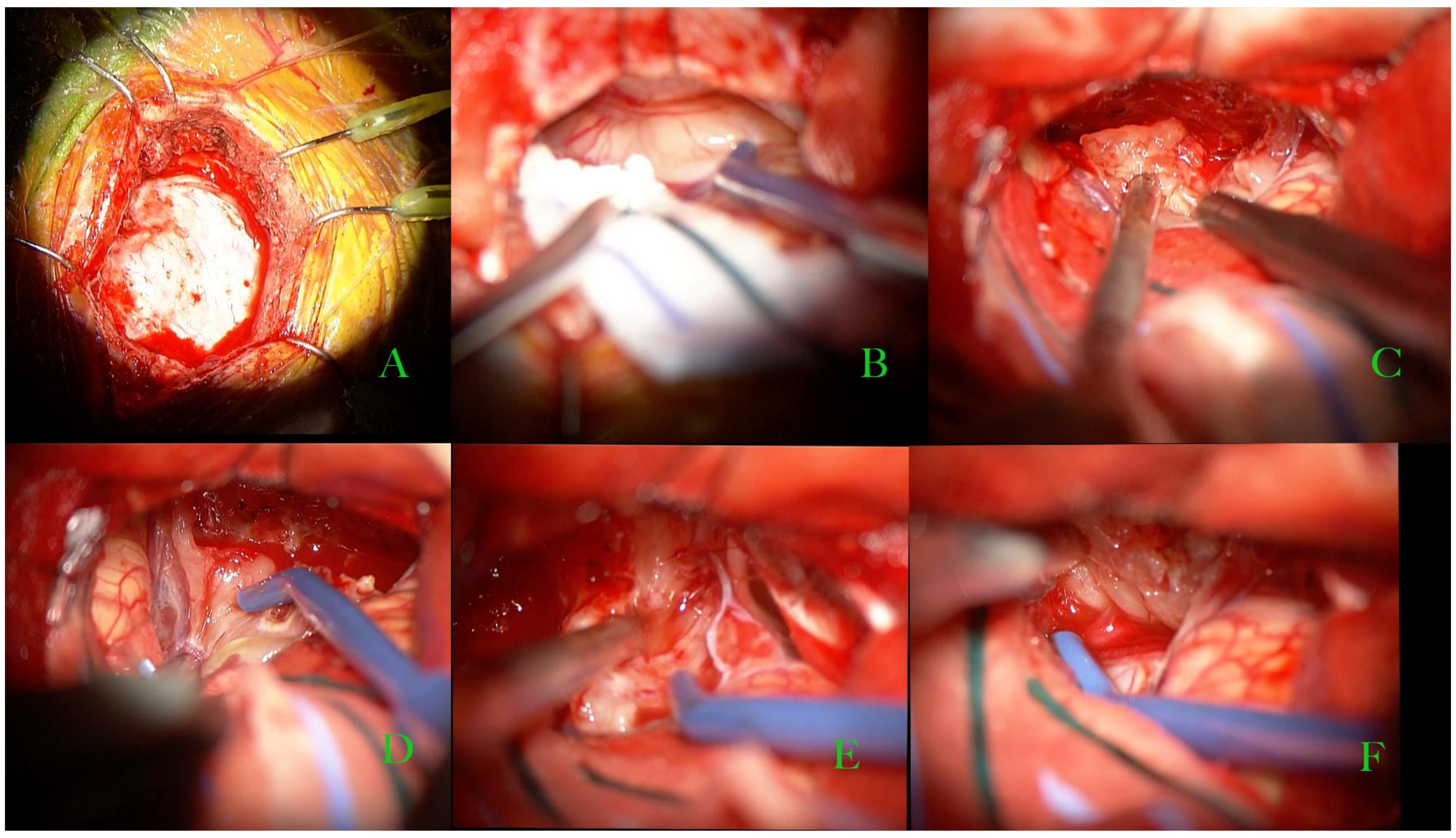

Figure 2. Keyhole retrosigmoid approach for resection of mass. A. Craniotomy site exposed. B. Using dynamic retraction, approaching tumor. C and D. Debulking mass, with careful consideration of arachnoid plane and facial nerve. E. Vestibular nerve identified. F. Facial nerve identified.

Introduction

Traditional approaches to large cerebellopontine angle (CPA) mass resection emphasize high visibility, but they do so with significant technical difficulties associated with length of drilling and positioning of patient. Increasingly, retrosigmoid approaches have been used to approach CPA masses. Skepticism, however, persists regarding adequacy of the approach to visualize the internal auditory canal, as well as the relative safety of the cranial nerves and managing mass effect when approached by this approach.

In this case we describe a 31-year-old male large cerebellopontine angle mass, and the technical details of keyhole retractorless retrosigmoid approach and facial nerve preservation implemented in this case.

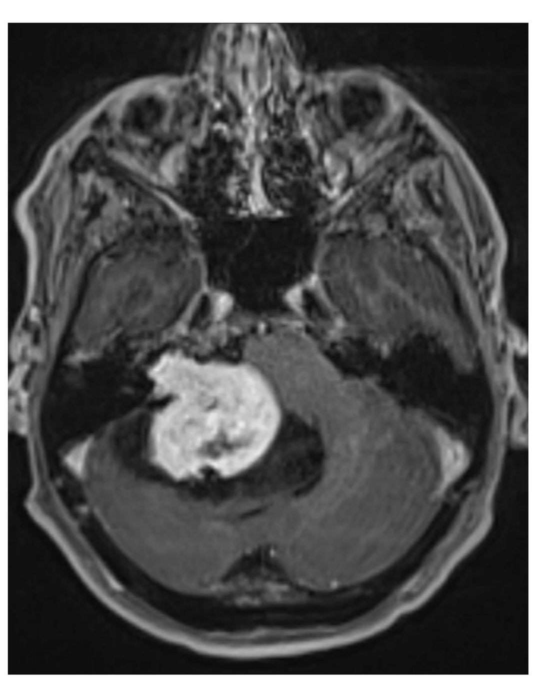

Figure 1. MRI demonstrating right cerebellopontine angle mass, with significant involvement of the auditory canal and compression of the brain stem.

Methods and Materials

The patient is a 31-year-old male, who presented with worsening headaches, blurring of vision, and gait imbalance. CT revealed him to have hydrocephalus, as well as a large cerebellopontine angle (CPA) mass. For this, an external ventricular drain (EVD) was placed emergently.

On MRI, it was found to have significant involvement of auditory canal, as well as compression of the brain stem (Fig. 1).

A keyhole retrosigmoid craniotomy was performed (Fig. 2A), with the patient placed in a supine position. Cerebrospinal fluid was released from the cerebellopontine cistern. Using dynamic retraction and a stimulating dissector, the tumor was internally debulked, using the Sonopet (Fig. 2 B and C). Circumferential dissection proceeded (Fig. 2D). Careful attention was paid to remaining in the appropriate arachnoid plane to avoid facial nerve injury. The lower cranial nerves were identified (Fig. 2E). Following further debulking, the facial nerve was identified (Fig. 2F). After this, tumor resection was continued in a piecemeal fashion from brainstem to internal auditory canal.

Results

Post-operative MRI demonstrated good resection with small residual mass in internal auditory canal (Fig. 3). EVD was weaned on post-op day four. Patient was discharged on post-op day five, at that time with House-Brackmann I palsy on the right side (Fig. 4). On six-week follow up, his incision was healing appropriately (Fig. 6), and no facial palsy was appreciated on exam (Fig. 7).

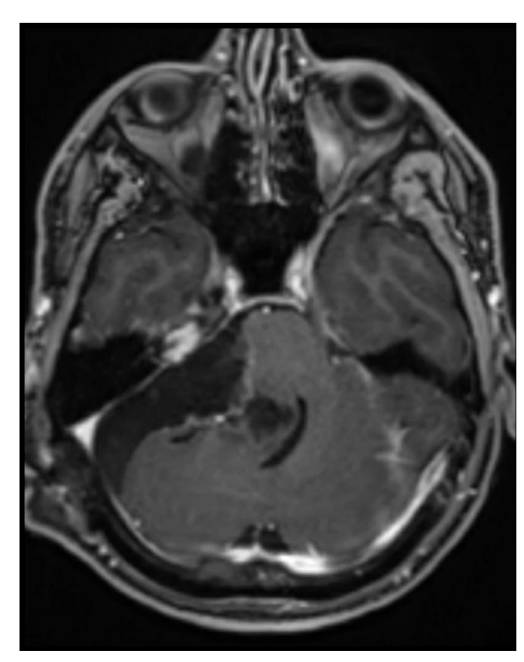

Figure 3. Post-operative MRI demonstrating small residual mass in internal auditory canal.

Figure 4. Immediately post-operative photo of patient, with House-Brackmann I palsy.

Figure 5. Retrosigmoid incision at six weeks post-operatively.

Figure 6. Patient a six weeks post-operatively, without appreciable facial palsy.

Conclusions

In this case we have an example of the visualization and safety of a keyhole retrosigmoid approach to a large cerebellopontine vestibular schwannoma with involvement of the auditory canal. Intra-operative testing of facial nerve along with careful dissection resulted in a good outcome for the patient. We believe the use of this approach will increase in coming years due to its flexibility and efficiency.

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