# Endoscopic trans-orbital approach - learning curve as new faculty, technical challenges and lessons learnt

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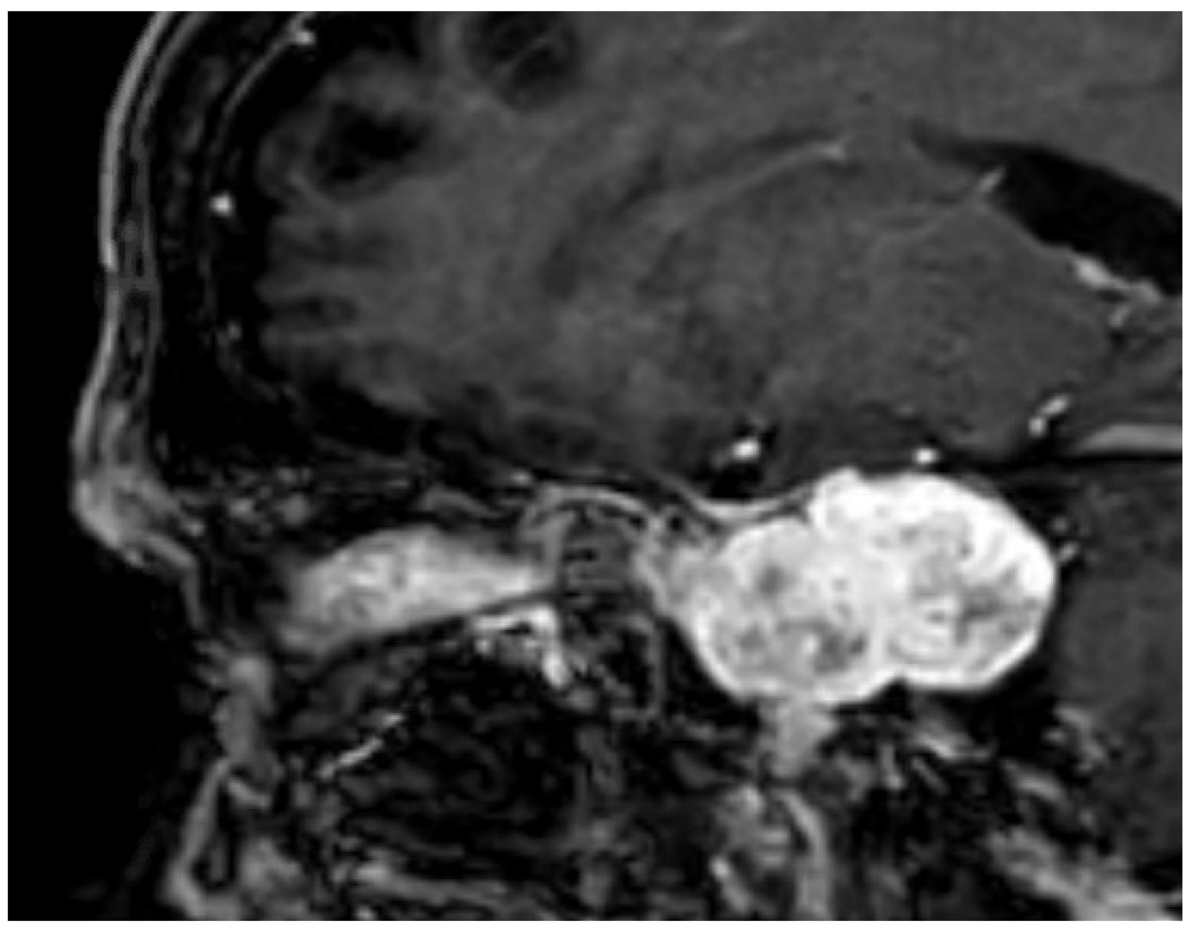

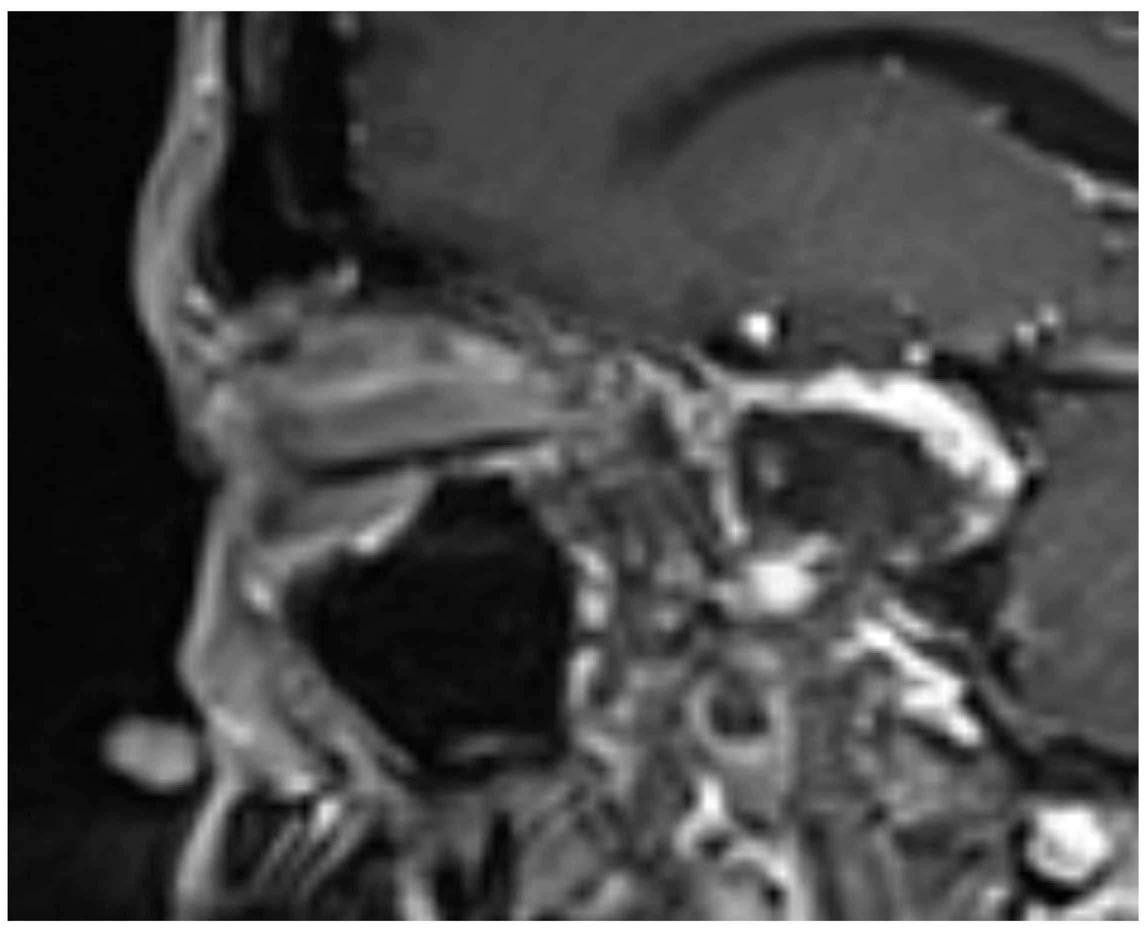

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| Male: 2<br>Female: 3 |
| Age: 27-64 |
| Biopsy: 3<br>Tumor resection: 2 |
| Extradural: 2<br>Intradural: 3 |
| Anterior skull base: 1<br>Middle skull base: 4 |
| Complications: 1 (transient blurry vision) |

## Introduction

Endoscopic trans-orbital approach (ETOA) is a relatively new approach based on the keyhole concept. It provides access to anterior and middle skull base and infratemporal fossa. The anatomy can be confusing; familiar bones are viewed through a different perspective.

## Methods and Materials

Cases performed in first 2 years of faculty position were reviewed and 5 cases of endoscopic assisted trans-orbital approach were identified (Table).

## Results

Surgical approach – all approaches were performed by neurosurgeons. An incision is made in the eyelid from its midpoint, gradually curving down to the lateral extent of the eyelid. We do not extend our eyelid incision laterally into the forehead as this puts the frontalis branch of facial nerve at risk. Periosteum extending into peri-orbita is elevated. A retractor is put in place primarily to protect the orbital contents. Orbital bone is drilled based on the location of the pathology. Lateral orbital rim (LOR) was removed in only one case by drilling the sphenoid wing down to temporalis muscle.

## Results

Care must be taken not violate the deep temporalis fascia. Orbital rim was removed using oscillating saw. Drilling, dissection and definitive steps are all performed with endoscopic assistance. A pediatric endoscope can be used in cases where only biopsy is required. It provides more working area due to its low profile and avoids removing the lateral orbital rim in every case.

Cases – are described in chronological order to demonstrate the learning curve.

First case involved a large trigeminal schwannoma originating from V2 branch. Initial approach was performed via an endoscopic endonasal corridor. A small residual which was extending into the sphenoid wing was accessed through endoscope assisted trans-orbital approach (ETOA). Second case involved temporal dural biopsy. Third case involved a large trigeminal schwannoma extending from superior orbital fissure back to posterior fossa and causing brainstem compression. This is the only case where LOR was removed. A small residual was left along the trigeminal nerve and surface of brainstem (Fig. 2). The trigeminal nerve function was preserved. Forth case involved an intradural intra-axial lesion in the frontal lobe which was accessed by drilling the orbital roof. Fifth case involved extradural drilling of hyperostotic sphenoid wing causing proptosis.

## Outcomes

No post-op cerebrospinal leak was noted in any case. Blurry vision was noted in 1 case which improved at the time of 6-week follow-up. No frontalis injury was noted. Excellent cosmetic results were achieved in all cases (Fig. 3).

Limitations – this is based on keyhole concept. Familiarity with orbital anatomy and comfort in working narrow surgical corridor is essential. Use of long low profile endonasal instruments is also important to gain access to deeper structures.

## Conclusions

ETOA can be safely performed in carefully selected patients and complexity can be gradually increased as the surgeon becomes familiar with anatomy and gains more experience. Cadaveric dissection is an essential step in learning these approaches. Lateral extension of incision into the forehead is not necessary. Lateral orbital rim can be spared for biopsies and smaller lesions.

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