Transorbital Approach for Resection of Intraorbital Meningioma

Luis G Fernandez III, MD; Pranay Soni, MD; Varun Kshettry, MD; Arun Singh, MD; Pablo F. Recinos, MD; Cleveland Clinic

Abstract

Here we demonstrate a transorbital approach via an eyelid incision using an exoscope for resection of a growing intraorbital meningoma in a patient presenting with proptosis, retroorbital headaches and left sided facial pain. Given the growing interest in transorbital approaches to skull base tumors our operative video highlights key steps including: incision planning, orbitotomy, lateral orbital wall decompression, extraconal dissection and orbital reconstruction.

Clinical Presentation

The patient was a 71-year-old female who had previously undergone a left fronto-temporal craniotomy for resection of a sphenoid wing meningioma 25 years prior to presentation. She presented with left sided proptosis as well as 4 months of left retroorbital headaches with pain in her left forehead and cheek. On exam she had left sided proptosis but was otherwise neurologically intact with normal Humphrey Visual fields. Imaging revealed a recurrence at the left medial orbital wall. A transpalpebral transorbital approach was performed with near total resection of the tumor and no post-operative visual deficits. The patient's proptosis resolved with transient relief of the retroorbital headaches which did return approximately 6 weeks post-operatively. Immediate post-op imaging (Figure 1) showed decompression of orbit and optic nerve with residual at orbital apex. Follow up imaging at 5 months showed interval growth of the residual tumor.

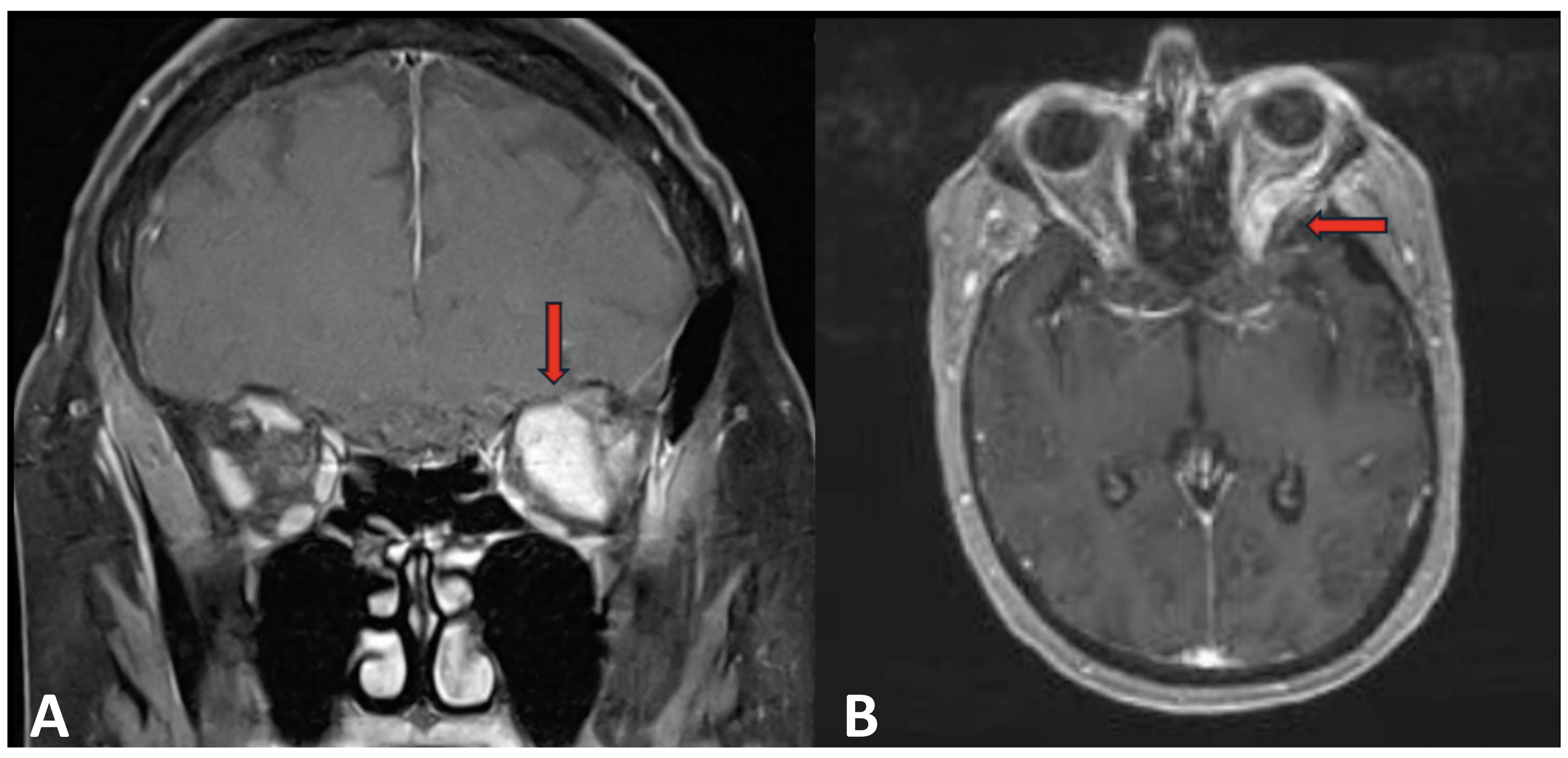

Figure 1. A) Coronal and B) axial T1 post-contrast MRI brain. The tumor arises from the orbital side of the left lateral orbital wall and displaces both the rectus muscles and optic nerve medially. The globe is slightly protruded as can be seen on the axial image.

Key Steps

- A transpalpebral incision is made and dissection is carried down to the orbital rim.
- The supraorbital notch is identified delineating the medial margin of the orbitotomy. The lateral orbital rim is exposed just below the fronto-zygomatic suture and the periorbita is stripped from the orbit.
- .The orbital rim is pre-plated and an ultrasonic cutter is used to make the orbitotomy.
- Dissection is carried down the lateral orbital wall and the ultrasonic cutter is used to decompress the lateral orbit. This is a critical step as it decompresses the optic nerve and creates working space for the tumor resection.
- The periorbita is opened and the tumor is centrally debulked and dissected away from the orbital contents.
- The orbital rim is affixed to the skull with low profile titanium plates and the incision is closed.

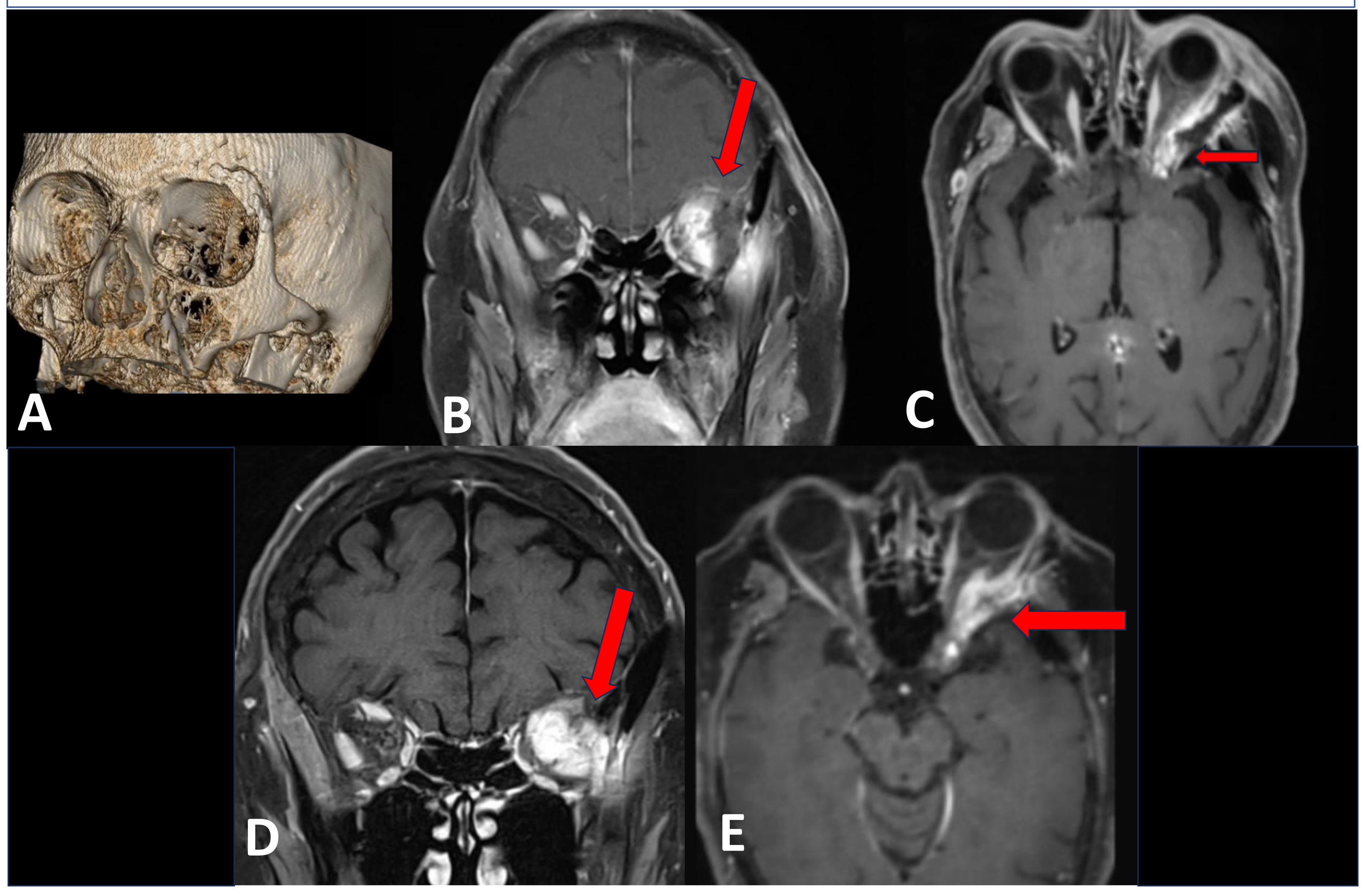

Figure 2. A) 3D reconstruction from immediate post-operative CT showing orbital reconstruction B) Coronal and C) Axial T1 post-contrast sequences showing debulking of the intraorbital tumor with residual at the orbital apex. D) Coronal and E) axial T1 post-contrast MRI showing interval growth of residual meningioma

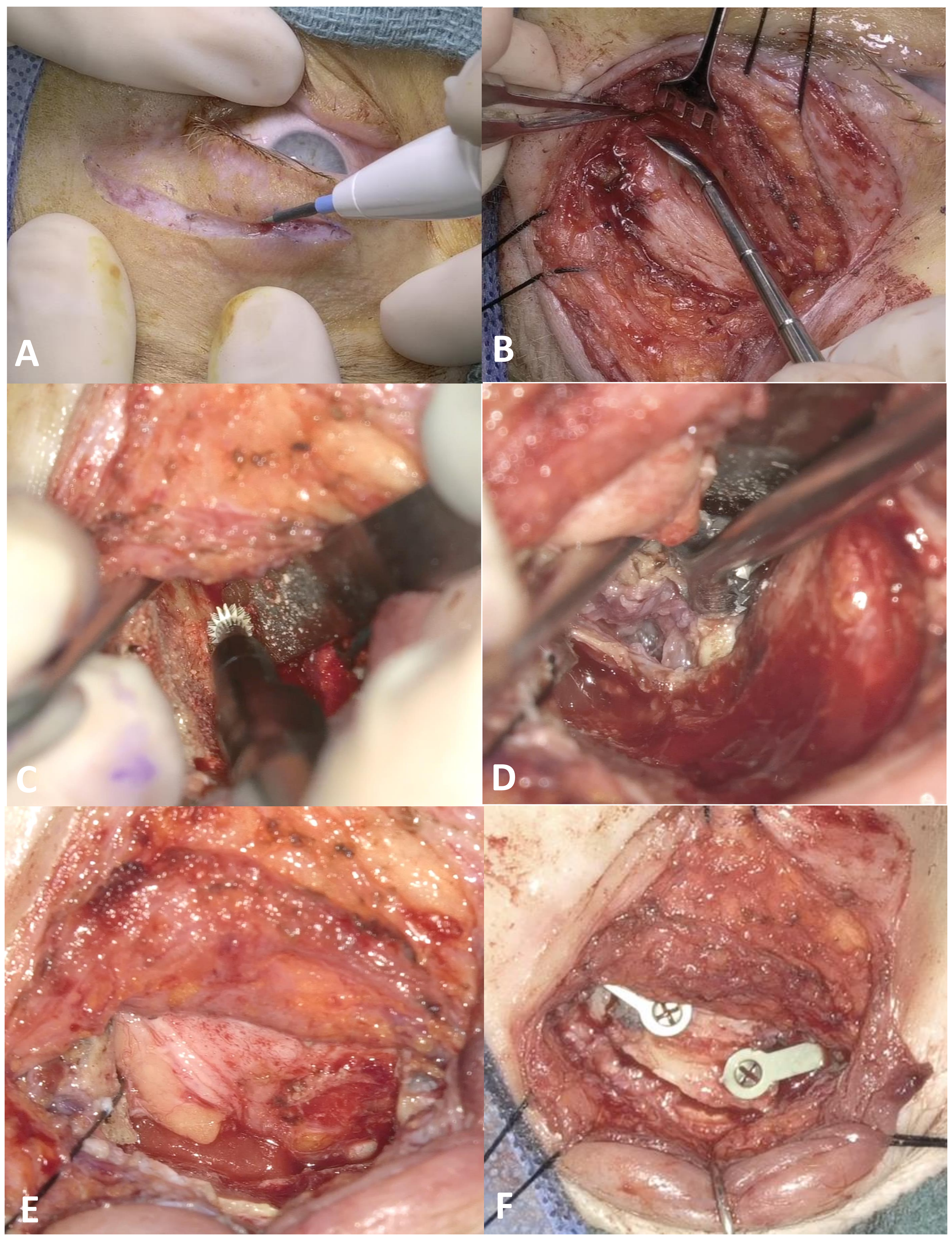

Figure 3. A) Transpalpebral incision B) Exposure of the superior and lateral orbital rim C) Decompression of the lateral orbital wall D) Tumor resection E) Post-resection, a small amount of periorbital fat extrudes from the periorbital incision. A dural substitute is tucked along the lateral orbital wall to the orbital apex. E) The pre-plated orbital rim is reattached

Discussion

Transorbital approaches have emerged as a valuable addition to the skull base surgeon's armamentarium, offering a minimally invasive corridor to select anterior and middle cranial fossa lesions while avoiding the morbidity of traditional transcranial approaches. In this case, a transorbital eyelid approach using an exoscope provided direct access to a recurrent intraorbital meningioma confined to the intraorbital compartment. Additional advantages over a traditional transcranial approach included a fresh surgical corridor free of prior scarring, no need for brain retraction, early orbital decompression, and optimal cosmesis. The exoscope provided three dimensional high-definition visualization within the confined orbital working space while maintaining an ergonomic over the microscope and traditional endoscopy. Compared with traditional endoscopy, the exoscope allows for bimanual microsurgical technique, improved depth perception, and seamless integration with standard microsurgical instruments. An advantage over the microscope is that the surgeon can maintain optimal ergonomic posture across multiple different visualization trajectories whereas the microscope requires the surgeon to be in line with the eyepiece when switching visualization angles. Key technical steps—including precise eyelid incision planning, lateral orbital wall decompression, controlled extraconal dissection, and rigid orbital reconstruction—were essential in achieving tumor debulking while preserving orbital contents and visual function. IMRT is planned for the growing residual

Conclusions

The transorbital transpalpebral approach is a safe and effective minimally invasive option for selected intraorbital and sphenoid wing meningiomas, particularly in patients with prior transcranial surgery. This approach provides direct access to intraorbital tumors, permits significant bony decompression of the orbit with excellent cosmetic outcomes, and favorable symptom resolution. Mastery of orbital anatomy, careful incision planning, and meticulous reconstruction are essential for optimal results. As experience with transorbital corridors continues to expand, these techniques should be considered a valuable adjunct in the multidisciplinary management of skull base tumors.

Contact

Luis Guillermo Fernandez III, MD
Cleveland Clinic
9500 Euclid Avenue
Cleveland, OH 44113
fernanl11@ccf.org
440-821-0670