



Minimally Invasive Transpalpebral “Eyelid” Craniotomy for Anterior Circulations Aneurysms: : 71 cases Experience

Khaled M. Aziz MD PhD; Kenan Alkhalili; Mohab M Darwish MD; Gasser Alshyal MD
Center of complex intracranial surgery
Allegheny Hospital, Drexel university



Introduction

Concept of minimally invasive approaches for anterior cranial fossa has been evolving during the past two decades. Supra orbital frontal mini-craniotomy with or without orbitotomy is the commonly utilized approached.

Methods

We describe the trans-palpebral eyelid incision which utilizes natural upper eyelid crease to obtain exposure for anterior circulation aneurysms through subfrontal-supraorbital corridor. The eyelid approach reduce risk of injury to frontalis branch of facial nerve. We will review our experience with 71 anterior circulation aneurysms.

Results

Extracranial drilling of the greater sphenoid wing exposes the frontal dura, temporal dura, and peri-orbita (spheno-orbital key-hole). One piece fronto-orbital craniotomy is performed in all cases with bone flap about 2.5 cm height. Optic foramnotomy and anterior clinoidectomy added when indicated. After dura open panoramic view of anterior cranial fossa floor achieved from the contralateral to epsilateral oculomotor nerve. We are describing the approach, technique in step-by-step fashion, discuss the results of our 71 cases . 3/71 complications (eyelid hematoma, superficial infection, CSF leak, delayed opst-operative cerebellar hematoma.

Conclusions

The transpalpebral approach provides dissection in natural anatomical planes, preserving frontalis muscle, avoids injury to VII nerve branches, and results in excellent cosmetic outcome

Learning Objectives

1.Understand the extent if exposure gained by this unique approach 2. Applications and limitations of the approach 3. Value of cosmetic outcome in modern neurosurgery

References

1. Minimally invasive transpalpebral "eyelid" approach to the anterior cranial base. Abdel Aziz KM, Bhatia S, Tantawy MH, Sekula R, Keller JT, Froelich S, Happ Neurosurgery. 2011 Dec;69(2 Suppl Operative):ons195-206; discussion 206-7. doi: 10.1227/NEU.0b013e31821c3ea3. 2. Transpalpebral orbitofrontal craniotomy: a minimally invasive approach to anterior cranial vault lesions. Owusu Boahene KD, Lim M, Chu E, Quinones-Hinojosa A. Skull Base. 2010 Jul;20(4):237-44. doi: 10.1055/s-0030-1249247.

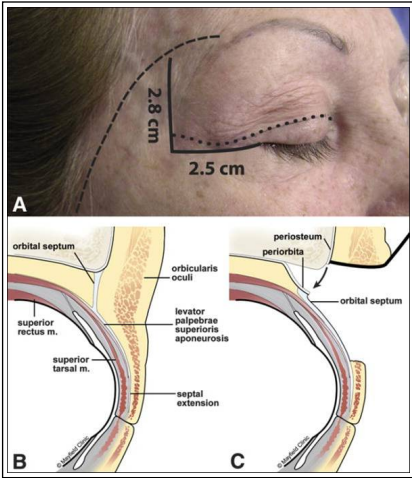


FIGURE 1 . A, patient photo showing the "safety zone" marked on patient's face. The safety zone is an area 2.5 cm lateral to the lateral canthus, which is free of facial nerve branches. The solid line marks the path of the temporal branch of the facial nerve. The dotted line marks the extent of the eyelid incision . B, sagittal cross section of the eyelid demonstrating the layers encountered after an upper eyelid incision . C, sagittal cross section demonstrating separation of the layers of the eyelid. The periosteum is divided sharply along the midpoint of the orbital rim, just above the orbital septum. Dissection of the periorbita from the roof of the orbit may be extended as far posteriorly as the orbital apex. m, muscle.

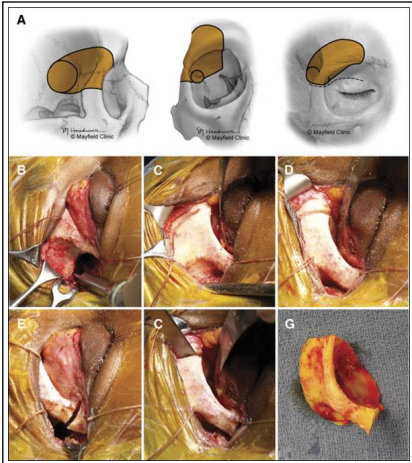


FIGURE 2 . B through G, operative still images. A, cartoon illustrations of skull with the fronto-orbital bony cuts outlined. Bony exposure, cuts, and craniotomy size are standard in all cases. Bone flap extends from the sphenoid keyhole opening medially to the lateral edge of the supratrochlear notch or foramen medially; anteroposterior extension is 2.5 cm from the supraorbital ridge. The bone flap includes the anterior two-thirds of the roof of the orbit. B and C, frontal bone cut starts from the frontal portion of the sphenoid keyhole and ends at the supraorbital ridge lateral to the supratrochlear notch. D, supraorbital ridge cut. E, zygomatic cut. F, orbital roof cut with the KA chisel. A soft malleable retractor blade protects the periorbita during this step. G, 1-piece fronto-orbital bone flap.