

Chapter 5

Surgical Approaches to the Orbit

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5.1 Introduction

Surgery of the orbit entails a firm understanding of complex bony and soft tissue anatomy, as the orbit consists of important neurovascular structures that are compressed into a small, confined space with often challenging visualization. Vascular lesions of the orbit are numerous, and careful consideration of clinical features and imaging characteristics, particularly with respect to anatomic location, is critical for surgical planning. Approaches are numerous and are governed by the lesion, size, location (anterior, mid-orbit, apex), and relationship to adjacent soft tissue and bone.

5.2 Anterior Orbit

5.2.1 Superior Orbit: Medial, Central, and Lateral

Lesions in the superior orbit that are anterior to the trochlea may be approached with a curvilinear subbrow or eyelid crease incision. The latter approach begins through the skin, followed by dissection in the suborbicularis plane, identification of the preaponeurotic fat pad, and incision of the orbital septum. If the lesion involves the bone beneath the periosteum, dissection superiorly to the periosteum of the orbital rim should be performed, followed by an incision into periosteum anterior to the arcus marginalis.

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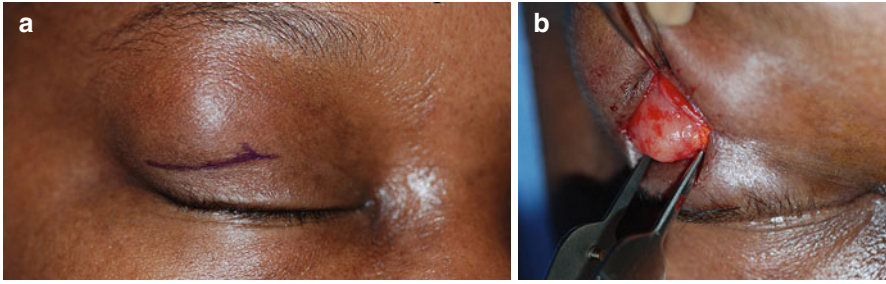


Fig. 5.1 (a) A lateral lid crease incision can be utilized to access the central and lateral anterior orbit. (b) A lacrimal gland lesion is shown, accessed through the lateral eyelid crease incision. (Images courtesy of Michael T. Yen, MD)

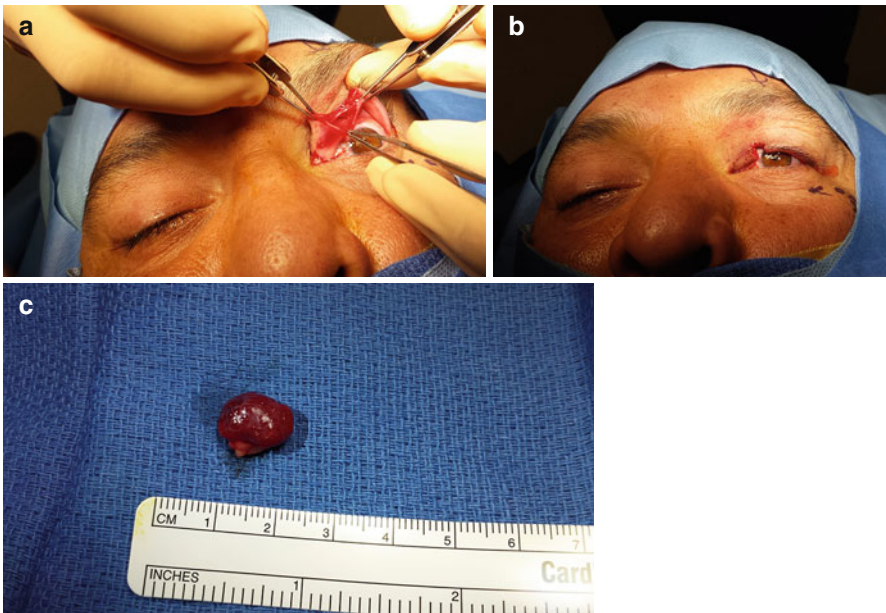


Fig. 5.2 (a) A full-thickness vertical lid split incision (perpendicular to the lid margin) can provide excellent operative space and visualization of the anterior orbit. (b) The external appearance of the vertical lid split orbitotomy after dissection is relatively small and easily closed. (c) Large orbital lesions, such as this venous malformation, can be excised through the vertical lid split incision (Images courtesy of Michael T. Yen, MD)

A direct or modified Lynch incision, conjunctival (with dissection through Tenon's capsule) incision, or a coronal incision may be necessary to approach the area in the superomedial orbit posterior to the trochlea, the latter in situations where there is a large lesion extending over the brow or intracranially. Exposure with distraction of the superior oblique tendon or elevation of the periosteum and trochlea may be necessary based on the lesion location and its relationship to the bone or

adjacent sinus. With a conjunctival approach, an incision is made through Tenon's capsule around the area of the equator of the globe, allowing access to the superomedial orbital tissue.

The eyelid crease incision can be utilized in most instances to approach the central and lateral superior orbit (Fig. 5.1a, b). Dissection is performed in the suborbicularis plane in front of the preaponeurotic fat pad, followed by incision through the orbital septum.

A subbrow approach may be more useful for deeper lesions posterior to Whitnall's ligament, particularly for supraperiosteal lesions. The space between the levator and superior rectus may be approached via a conjunctival approach. For further deeper lesions, a lateral orbitotomy or vertical lid split orbitotomy may be necessary.

In the vertical lid split technique, a full-thickness vertical incision (perpendicular to the lid margin) is made at the junction of the medial and central thirds of the upper eyelid. The skin, orbicularis, and tarsal plate are cut, extending superiorly through the palpebral conjunctiva into the superior fornix. Blunt dissection is then utilized to enter the orbit (Fig. 5.2a-c).

5.2.2 Inferior Orbit: Lateral and Central

Lesions of the central and lateral inferior orbit may be approached via a transconjunctival swinging eyelid technique. Preseptal lesions may be approached directly via a subciliary incision, although this results in a visible scar and may increase the risks of lid retraction. An inferior fornix/transconjunctival approach can be utilized to reach the inferior orbit in the majority of cases, with an adjunctive lateral canthotomy and inferior cantholysis swinging eyelid approach for further exposure (Fig. 5.3a, b). The transconjunctival incision can be extended medially utilizing a transcaruncular incision to provide further access inferomedially.

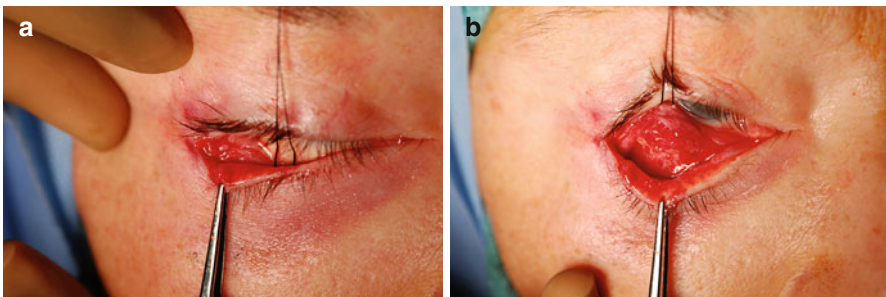


Fig. 5.3 (a) A transconjunctival swinging eyelid orbitotomy incision is created with a lateral canthotomy and inferior cantholysis to provide access to the inferior orbit. (b) The conjunctiva and lower eyelid retractors are retracted superiorly, exposing an inferior orbital lesion (Images courtesy of Michael T. Yen, MD)

5.2.3 Medial Orbit

A transcaruncular approach can be utilized to approach the medial orbit. In this technique, an incision is made in the caruncle and extended superiorly and inferiorly. Careful attention is paid to avoid injury to the canalicular system. Curved tenotomy scissors are then inserted, and gentle, blunt dissection is performed over the posterior lacrimal crest, thereby exposing the periosteum of the medial orbital wall. The anterior and posterior ethmoidal vessels serve as useful landmarks.

A direct cutaneous incision above/lateral to the medial canthal tendon or a standard dacryocystorhinostomy incisional approach may be needed for lesions posterior to the lacrimal sac. Disinsertion of the medial canthal tendon, followed by elevation of the ligament and periosteum overlying the anterior rim of the lacrimal crest, can be used to obtain access to this particular space.

5.3 Mid-orbital Lesions

5.3.1 Superior Orbit: Medial, Central, and Lateral

Access to the mid-orbit involves extensions of techniques utilized to approach the anterior orbit. The superomedial orbit can be accessed via a modified Lynch incision, subbrow incision, or an eyelid crease incision. A coronal approach may be necessary for approaches requiring access to the frontal bone/skull or involving extension intracranially.

Access to the lateral mid- and posterior orbit may require a lateral orbitotomy. A coronal incision may also be utilized for complicated lesions involving the frontal bone of the intracranial space. A lateral orbitotomy incision begins with a direct lid crease or lazy-S incision. Once the frontozygomatic process and the upper margin of the zygomatic arch are identified, an incision is extended laterally from the lid crease to slightly superior to the lateral canthal tendon. Dissection is performed to expose the periosteum of the frontozygomatic arch. An incision is then made through the periosteum and the periosteum elevated onto the anterior orbital rim anteriorly and posteriorly to detach the temporalis muscle. A bony incision is then made just above the zygomaticofrontal suture line and inferiorly along the superior margin of the zygoma utilizing an oscillating bone saw. The periorbita can then be incised to access the lateral orbit.

5.3.2 Inferior Orbit, Lateral

Access to the inferior and inferolateral mid-orbit can be obtained by utilizing a swinging eyelid technique, where a lateral canthotomy and inferior cantholysis are performed to disinsert the eyelid, followed by extension of the incision

centrally and medially via a transconjunctival approach. The incision can be further extended medially via a transcaruncular incision to provide further exposure.

5.4 Apical Lesions

5.4.1 Medial Orbit

Access to lesions in the posterior third of the orbit medially can be obtained by a transcaruncular approach, a conjunctival/semilunar fold incision (with or without disinsertion of the medial rectus), or a direct cutaneous incision/Lynch incision. A direct cutaneous approach may be useful for lesions of the medial orbit with involvement of the ethmoid sinus. A collaborative transcranial approach with neurosurgery may be necessary for apical lesions superior to the optic nerve.

5.4.2 Superior, Lateral, and Inferior

A lateral orbitotomy may be utilized to access the area inferior and lateral to the optic nerve. The lateral orbitotomy may need to be extended posteriorly with removal of the bone up to the superior and inferior orbital fissure. Involvement of the intracranial cavity may necessitate a collaborative transcranial approach with neurosurgery.

5.5 Conclusion

Surgery of the orbit requires a firm foundation of orbital anatomy and an understanding of the clinical disease process. Meticulous preoperative planning with attention to the location of pathology, nature of the disease process and its effects, objectives of surgery, and anticipated alterations in anatomy is critical.

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