



Eyelid Reconstruction

Michael Underbrink, M.D.

Karen Calhoun, M.D.



Introduction

- ◆ Goal: restore normal anatomy and function
- ◆ Various reconstructive techniques
- ◆ Complex anatomy

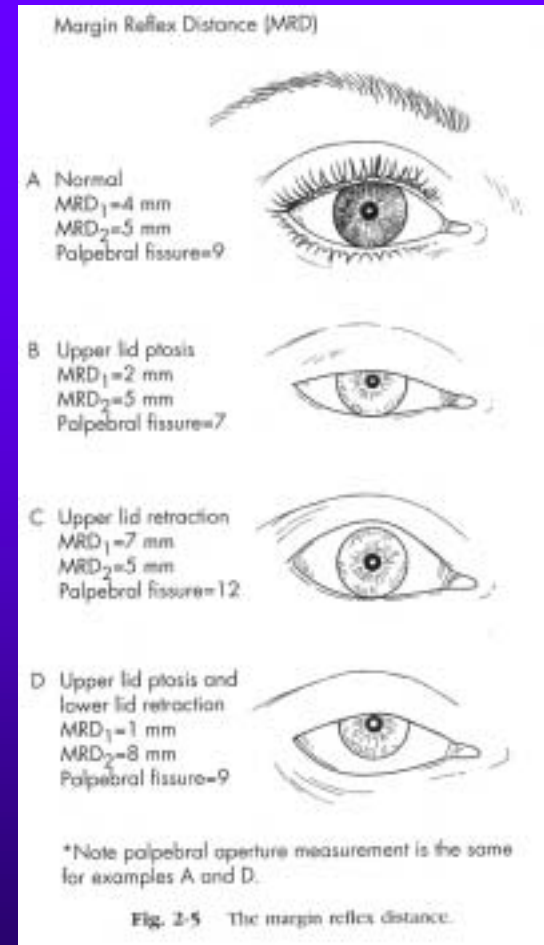


Anatomy

- ◆ Eyelid functions
 - Protect eye (light, injury, desiccation)
 - Tear production and distribution
- ◆ Anterior/posterior lamella
- ◆ Extremely thin skin (upper > lower)
- ◆ Skin
 - Little subcutaneous fat
 - Adherent over the tarsus (levator aponeurosis)

Anatomy

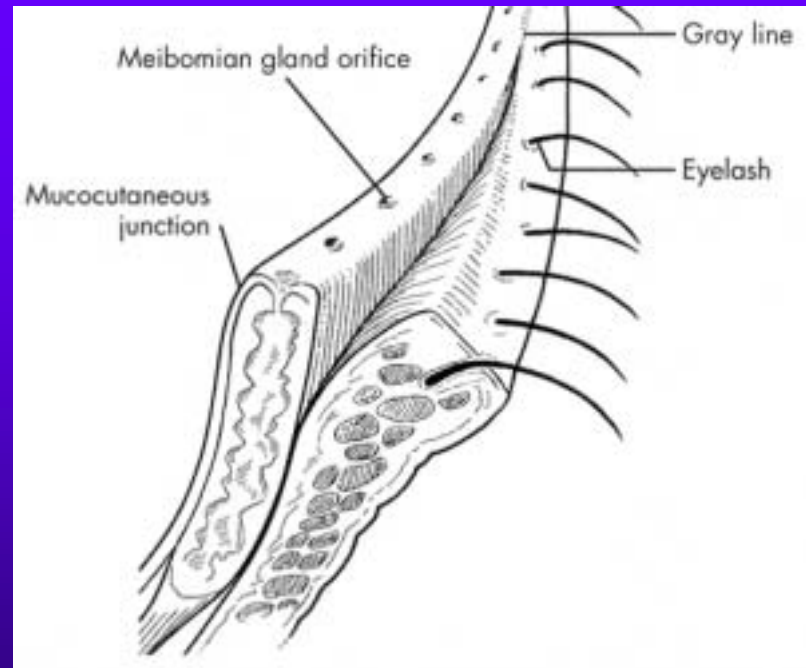
- ◆ Horizontal length – 30 mm
- ◆ Palpebral fissure – 10 mm
- ◆ Margin reflex distance
 - Number of millimeters from the corneal light reflex to the lid margin
 - Upper lid – 4 to 5 mm (rests slightly below limbus)
 - Lower lid – 5 mm (rests at the lower limbus)
 - Reflex to limbus – 2.5 mm



Anatomy

◆ Tarsus

- Dense, fibrous tissue
- Contour and skeleton
- Contain meibomian glands
- Length – 25 mm
- Thickness – 1 mm
- Height
 - Upper plate – 10 mm
 - Lower plate – 4 mm

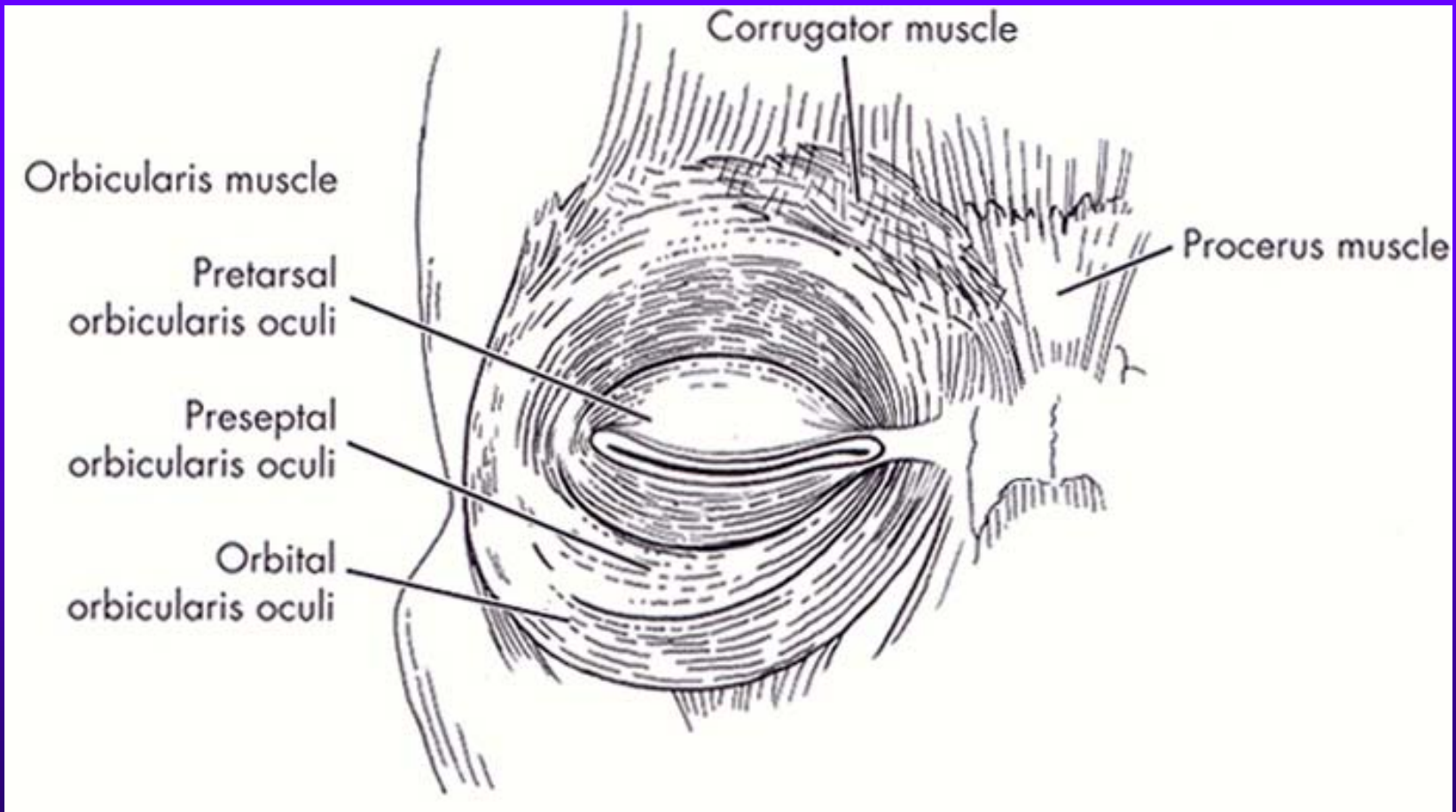




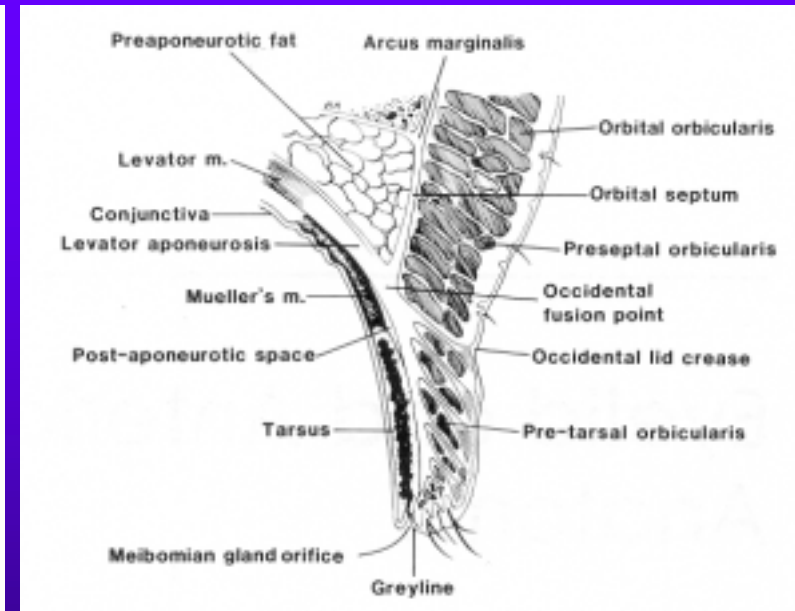
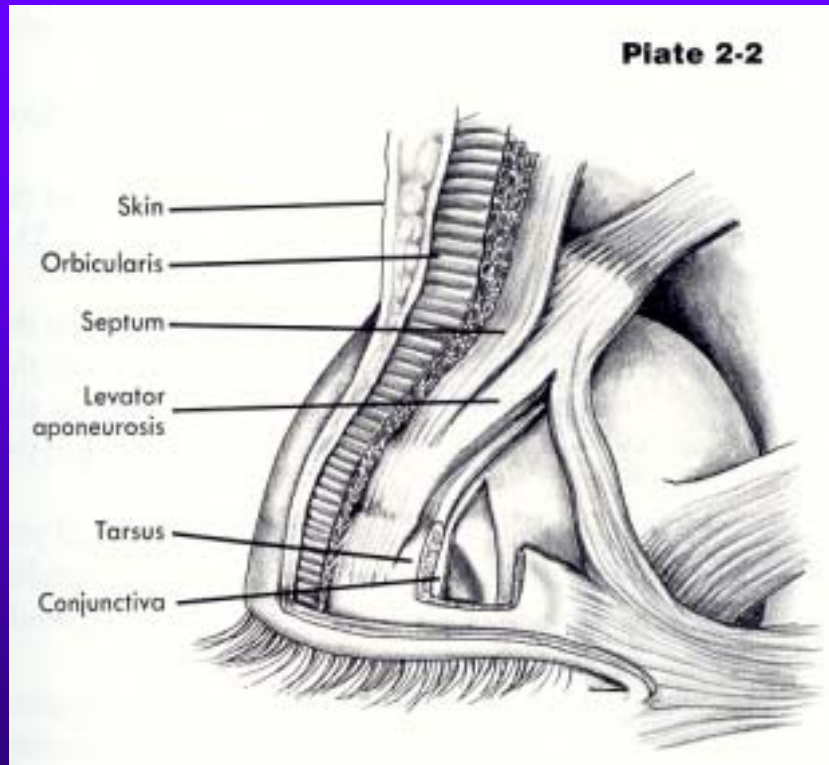
Anatomy – Muscles

- ◆ Protractor
 - Orbicularis
- ◆ Retractors
 - Levator
 - Müller's

Orbicularis Oculi Muscle



Levator palpebralis superioris and Müller's muscle



Lower Lid Anatomy

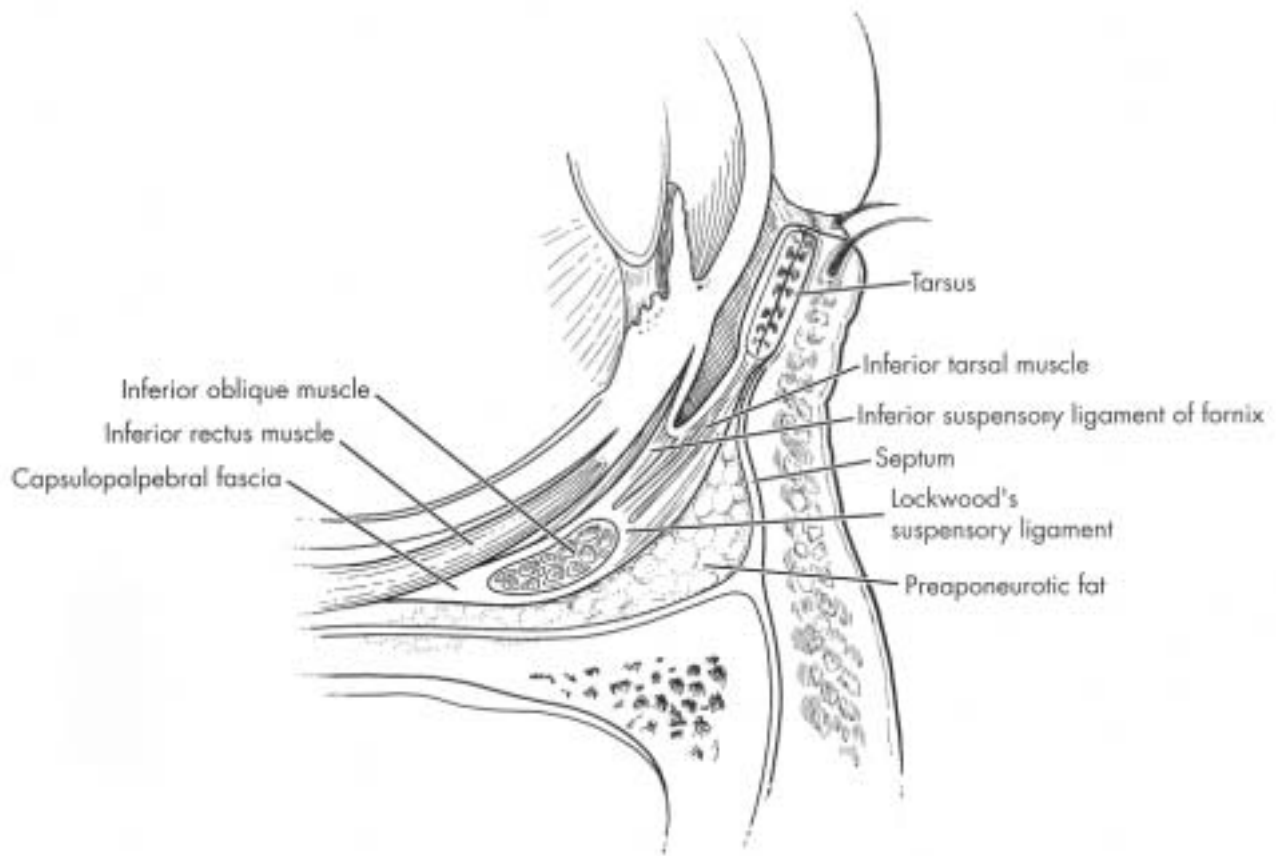
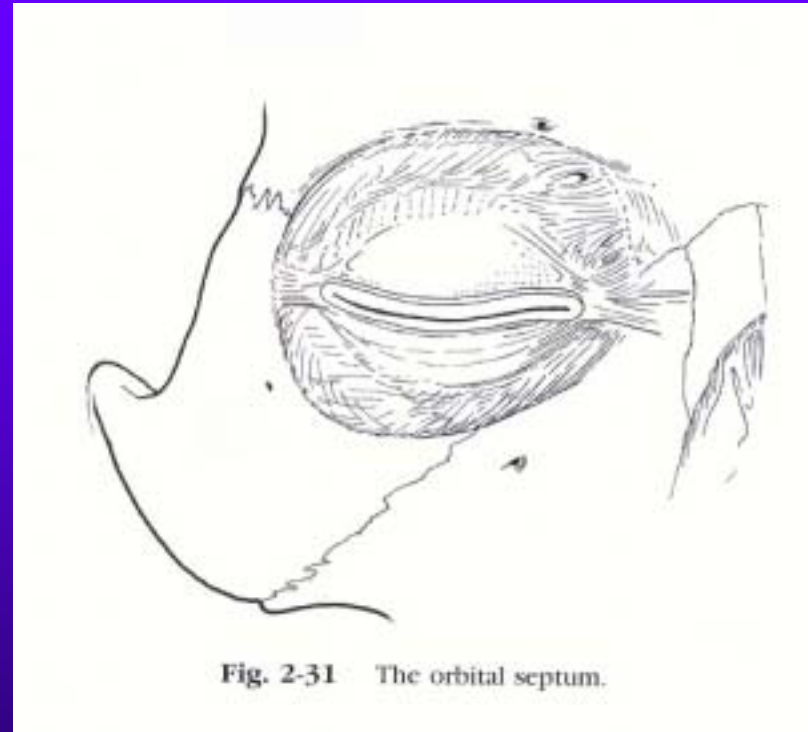


Fig. 2-28 Cross-section of the lower eyelid retractors.

Anatomy

- ◆ Orbital Septum
 - Fascial barrier
 - Underlies posterior orbicularis fascia
 - Defines anterior extent of orbit and posterior extent of eyelid



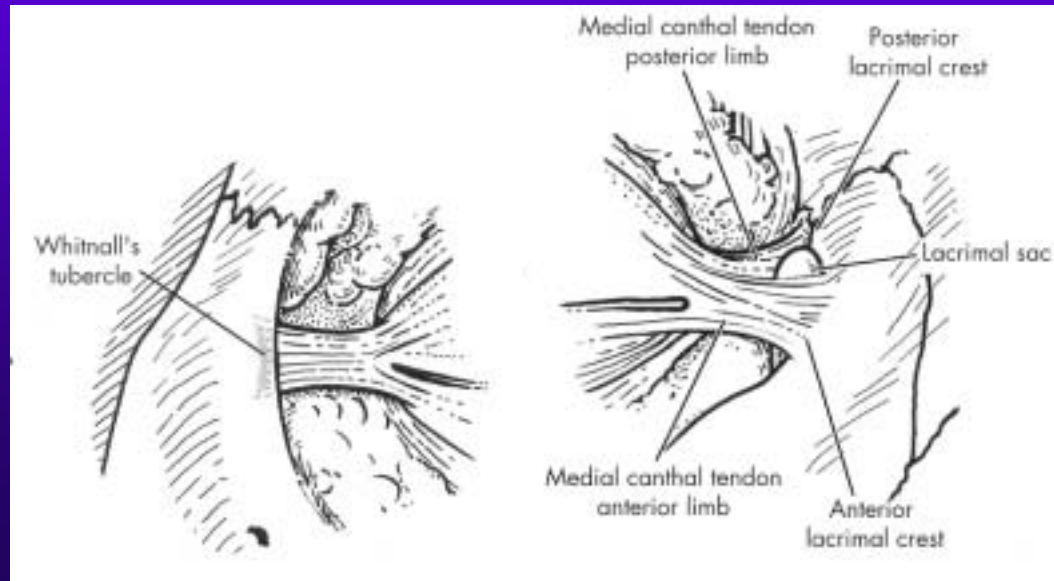
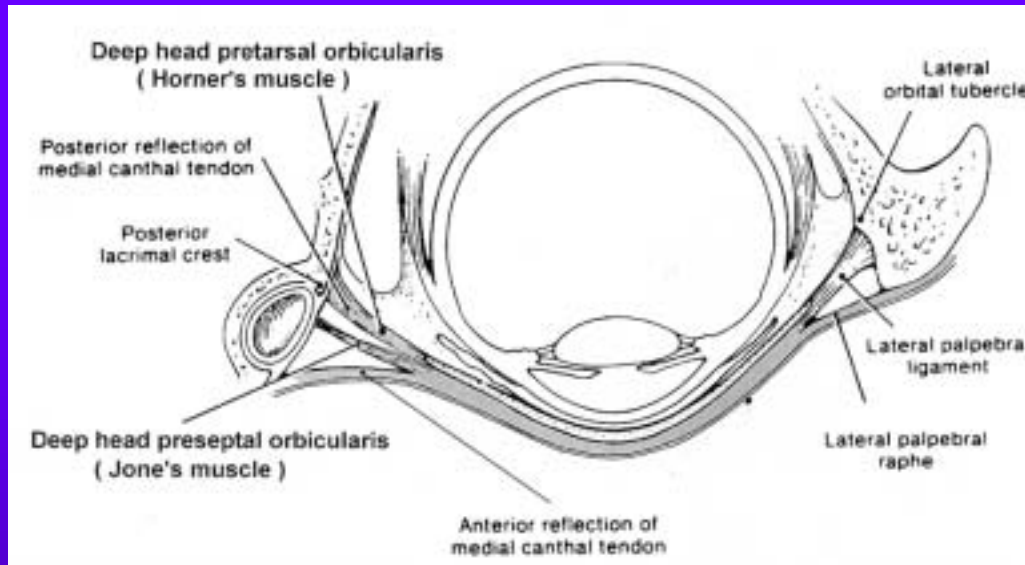


Anatomy

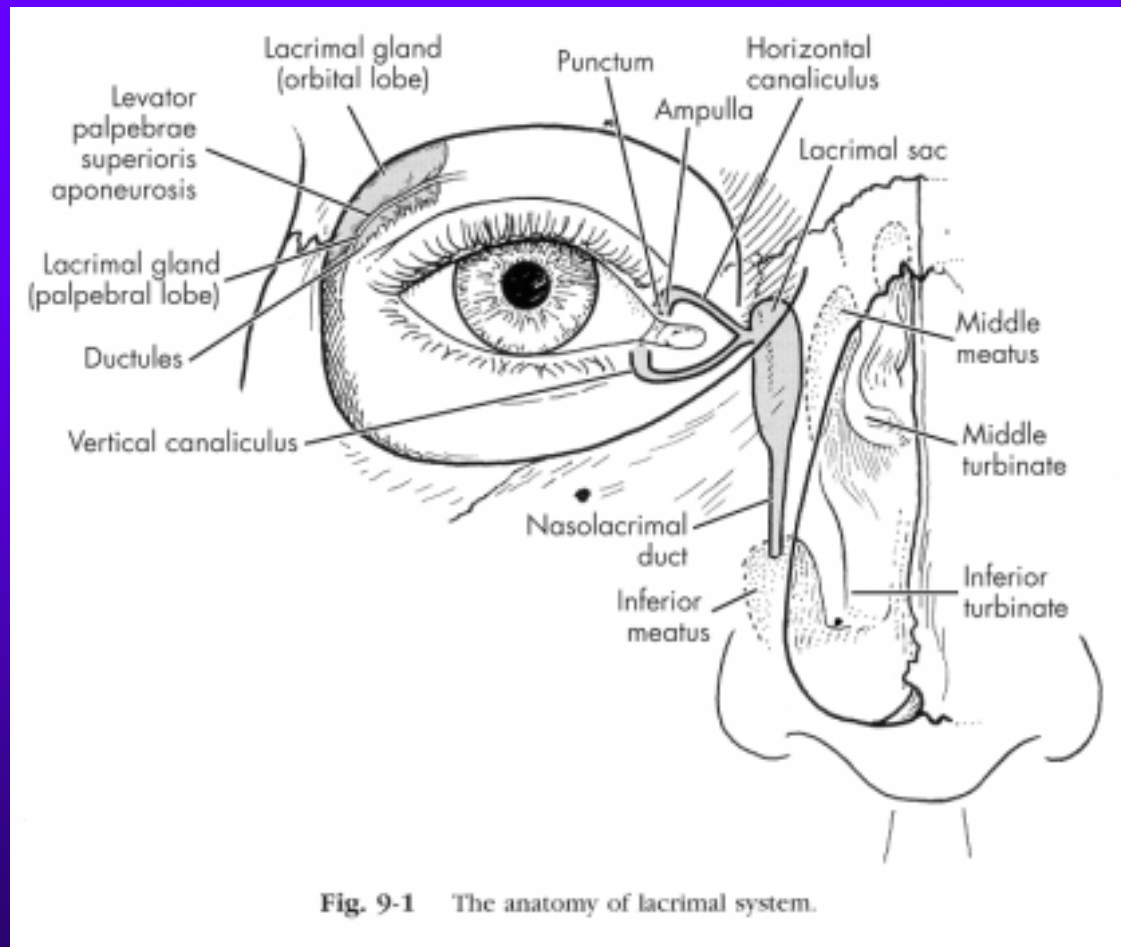
◆ Canthal tendons

- Extensions of preseptal & pretarsal orbicularis
- Lateral slightly above medial
- Lateral tendon attaches to Whitnall's tubercle
1.5 cm posterior to orbital rim
- Medial tendon complex, important for lacrimal pump function

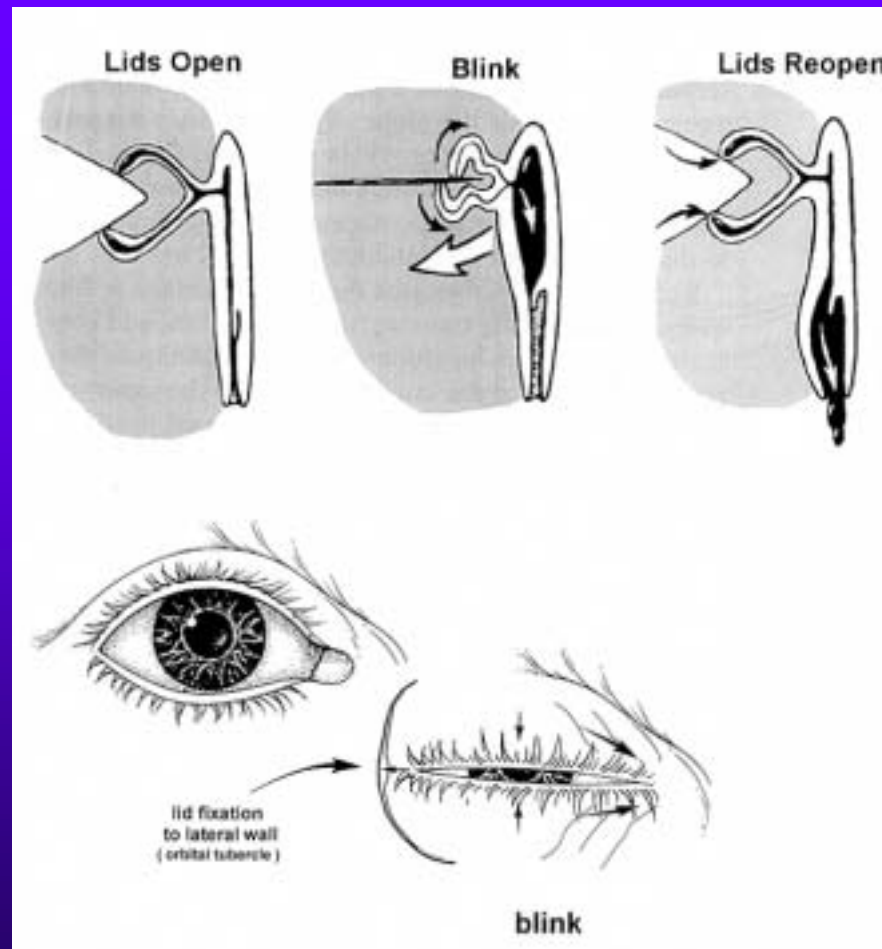
Canthal Tendons



Lacrimal System

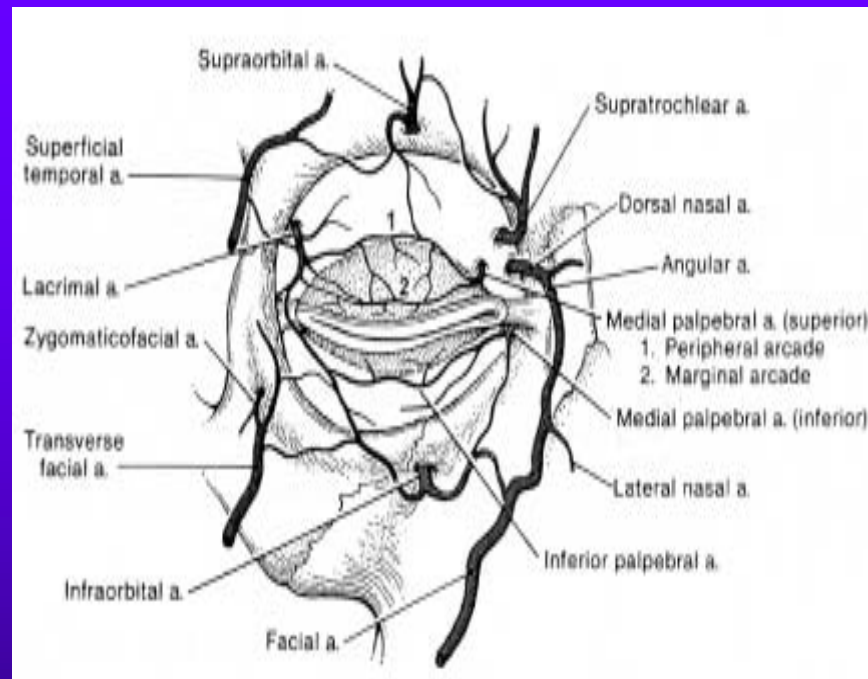


Lacrimal Excretory Pump



Anatomy – Blood Supply

- ◆ Rich anastomoses from internal and external carotids
- ◆ Marginal arcades – 2 to 3 mm from lid margin
- ◆ Peripheral arcade – upper lid between levator aponeurosis and Müller's muscle





Related Vocabulary

- ◆ Ptosis – upper eyelid margin abnormally inferiorly displaced
- ◆ Entropion – inward rotation of eyelid margin
- ◆ Ectropion – eversion of eyelid margin
- ◆ Trichiasis – misdirected eyelashes
- ◆ Distichiasis – aberrant eyelashes from metaplastic meibomian glands
- ◆ Epiblepharon – normal eyelashes pushed toward the eye by redundant folds of skin
- ◆ Epicanthal folds – vertical folds of skin over the medial canthus



Lower Eyelid Reconstruction

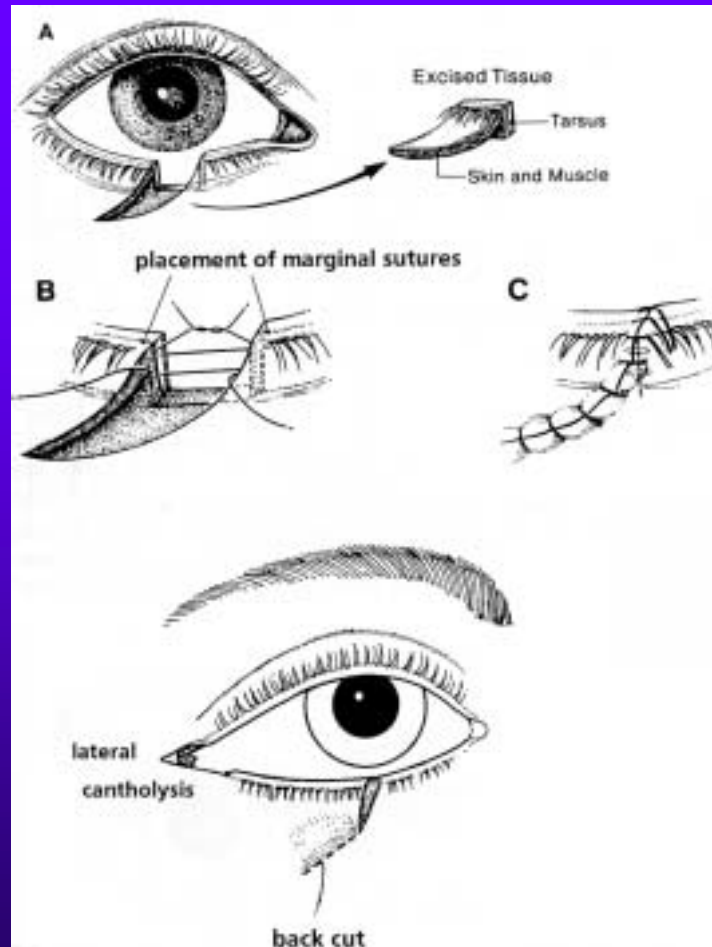
- ◆ Direct Closure
- ◆ Lateral Cantholysis
- ◆ Tenzel Rotational Flap
- ◆ Free Tarsal Grafts
- ◆ Hughes Procedure
- ◆ Mustarde (rotational cheek) Flap



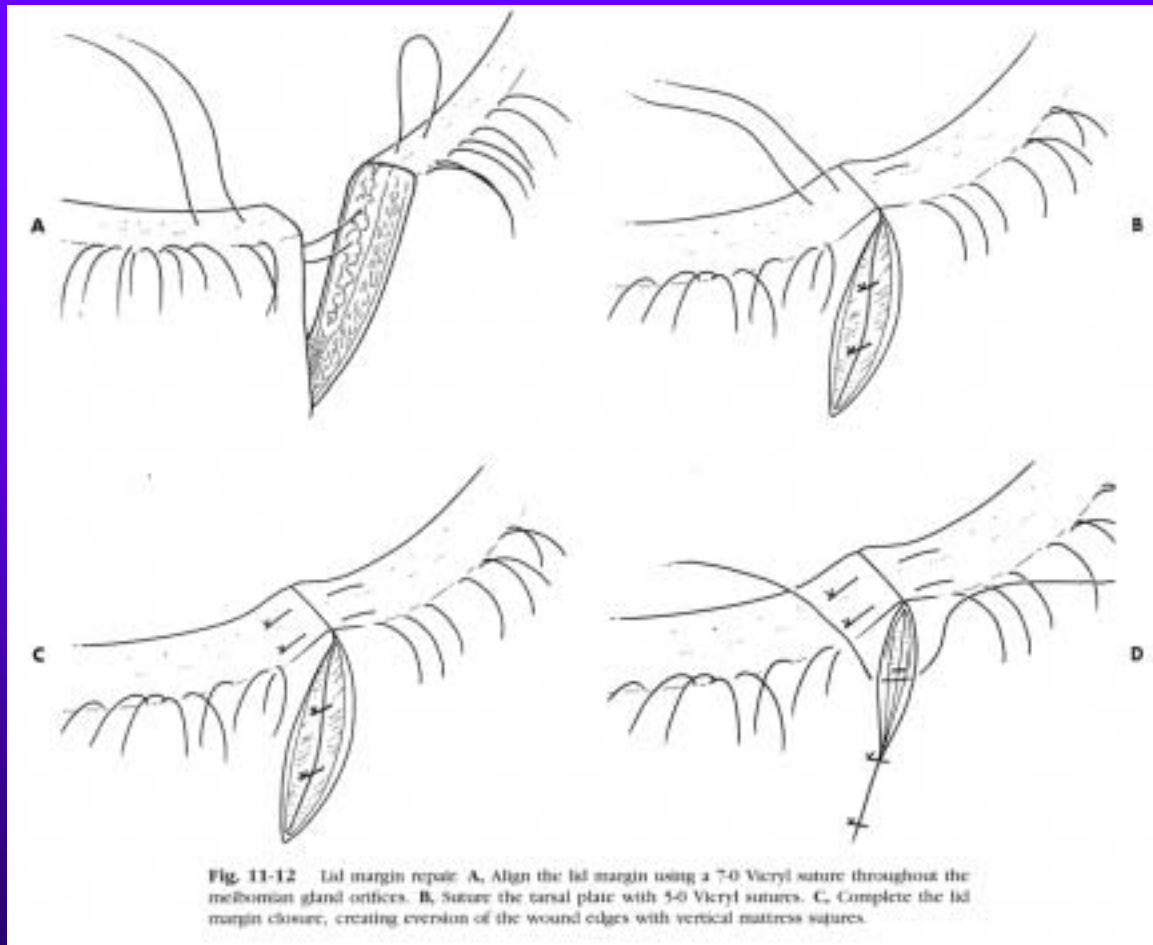
Direct Closure

- ◆ 30% defects in young patients
- ◆ Up to 45% in older patients with more eyelid laxity
- ◆ Lateral cantholysis provides additional 5 mm
- ◆ Tarsal defect should be squared
- ◆ Temporal slant to musculocutaneous layer

Direct Closure



Lid Margin Repair

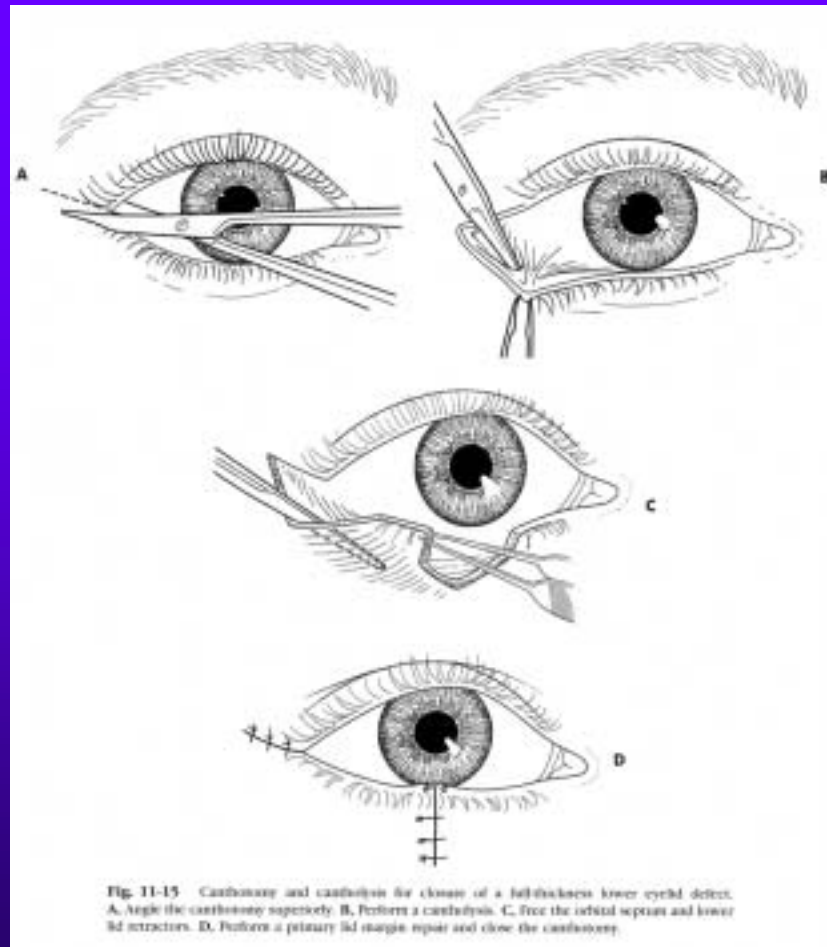




Lateral Cantholysis

- ◆ Additional 5 mm of advancement
- ◆ Split upper and lower canthal tendons
- ◆ Detach lower limb (upper limb)
- ◆ Angle skin incision superiorly
- ◆ Anchor muscle layer to periosteum after closure of defect

Lateral Cantholysis

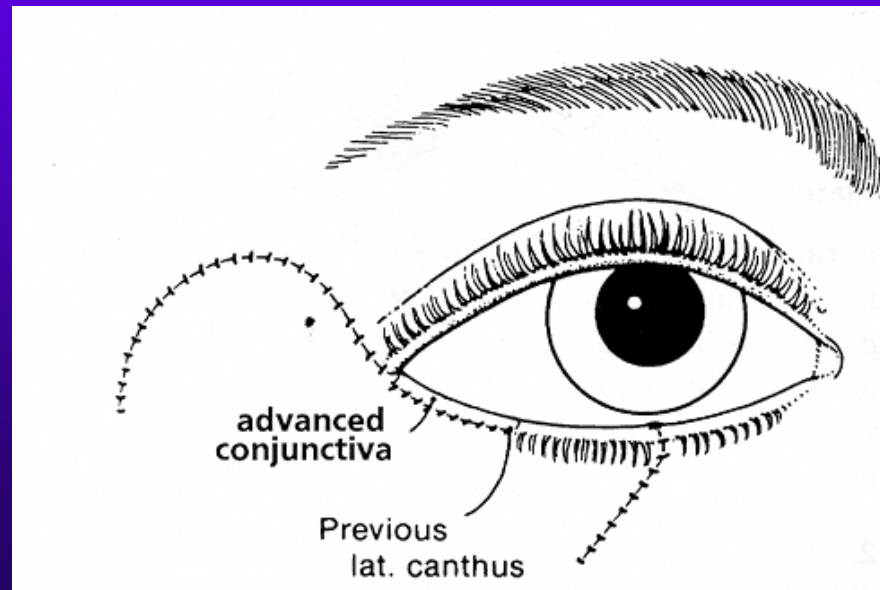
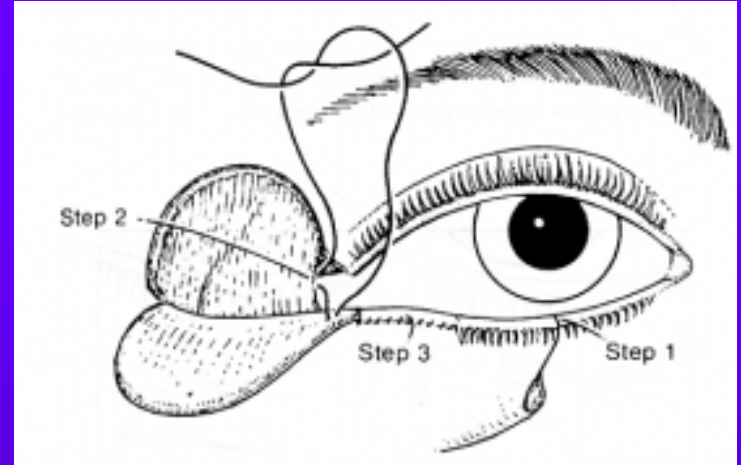
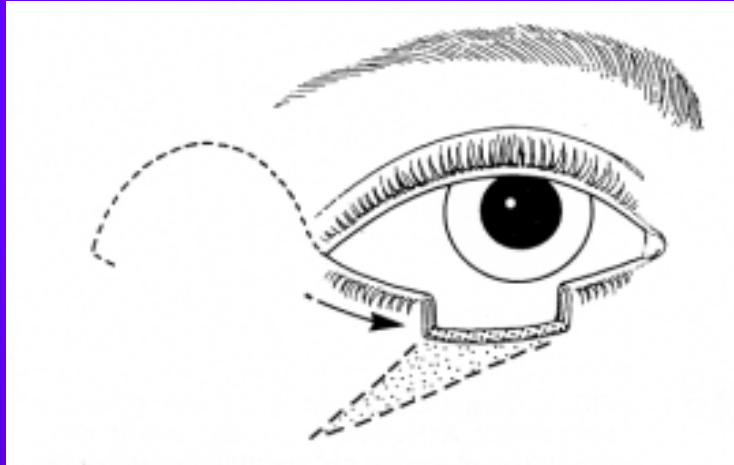




Tenzel Rotational Flap

- ◆ Semicircular musculocutaneous flap
- ◆ Defects up to 60%
- ◆ Flap must arch upward
- ◆ Fixation of muscle to periosteum superior to canthal attachment avoids droop of lid
- ◆ Additional support of lateral lid can be achieved with periosteal strip from lateral orbital rim

Tenzel Flap





Free Tarsal Graft

- ◆ Free tarsocunjunctival flap
- ◆ Harvested from ipsilateral/contralateral lid
- ◆ Posterior lamellar replacement
- ◆ Cover with myocutaneous advancement

Free Tarsal Graft



Figure 68.8. Free tarsal graft is removed from ipsilateral or contralateral upper lid; the donor site is not sutured.



Figure 68.10. Skin muscle flap, which has been moved medially from the ambleuricular flap, is sutured to the tarsal graft with 6-0 plain gut and the lateral skin edges are closed appropriately with Burrow's triangles, as needed to avoid redundant skin. The tarsal graft helps to support the lateral skin segment.

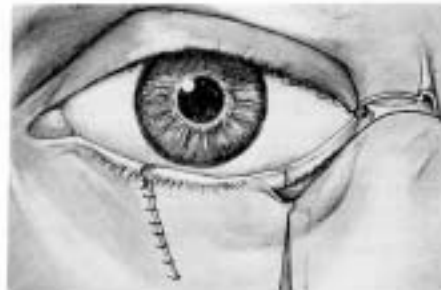


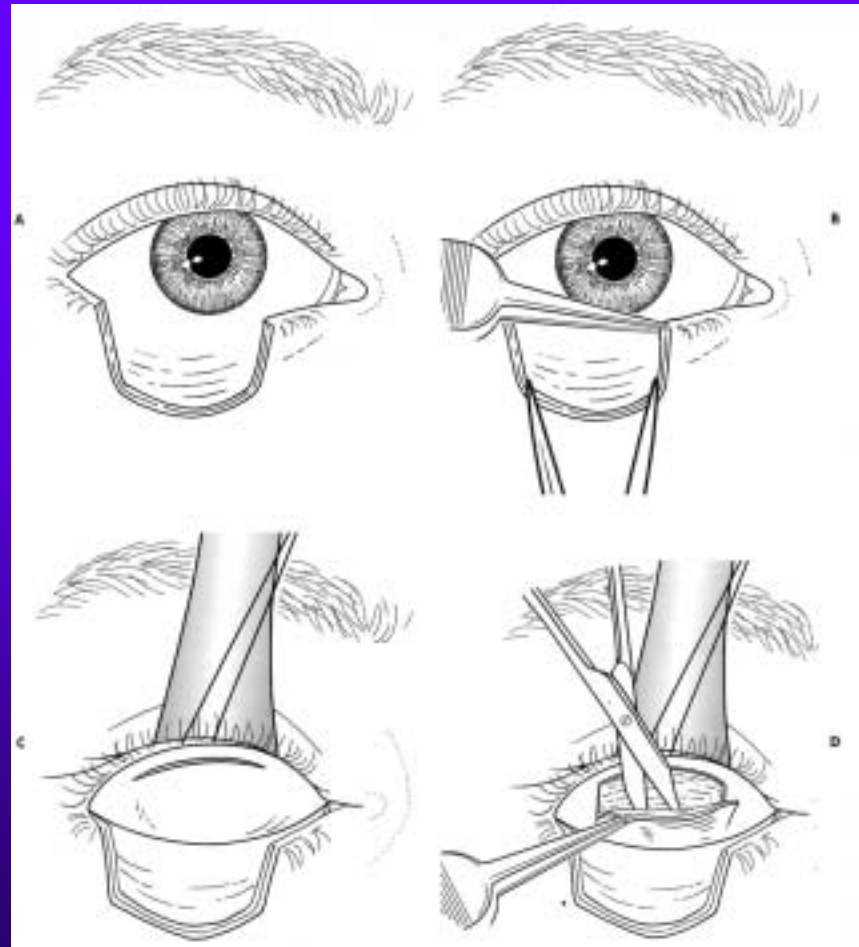
Figure 68.9. This tarsal graft is sutured to the lateral aspect of the tarsus in the lateral lid segment. It is also joined to the upper limb of the lateral canthal tendon and lateral orbital tubercle; this should fit snugly.



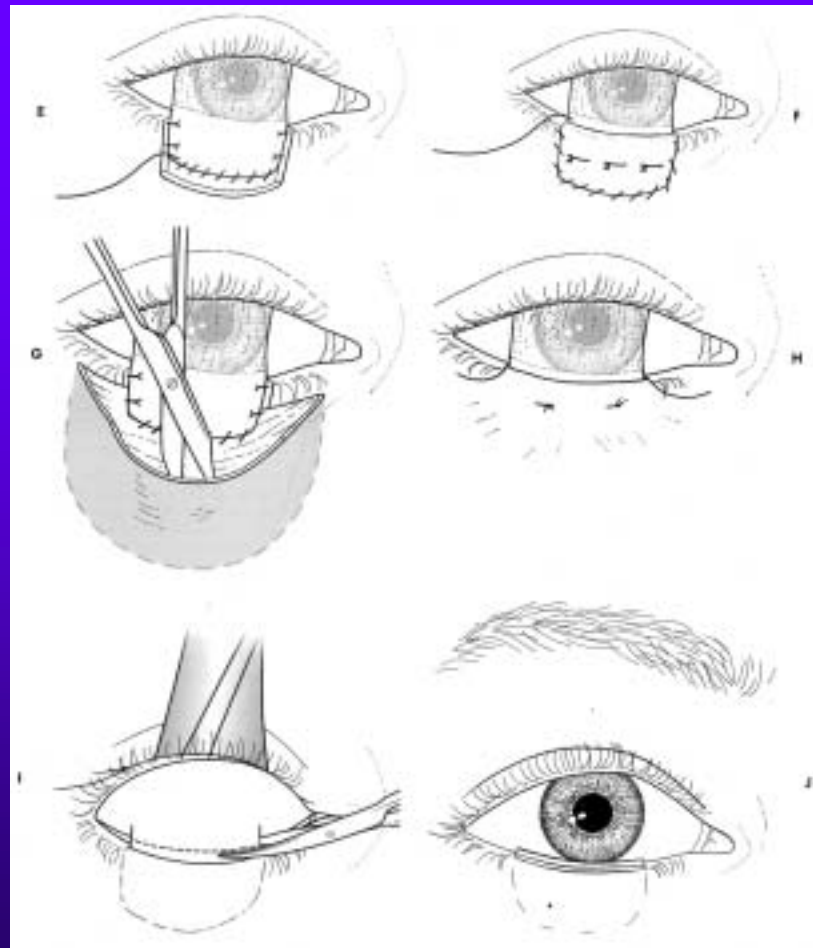
Hughes Procedure

- ◆ Tarsconjunctival Flap for posterior lamella
- ◆ Defects greater than 50%
- ◆ Vertical upper lid to lower lid sharing
- ◆ Anterior lamella reconstruction
 - Advancement musculocutaneous flap
 - Free skin graft
- ◆ Requires 2nd stage procedure

Hughes Procedure



Hughes Procedure (continued)

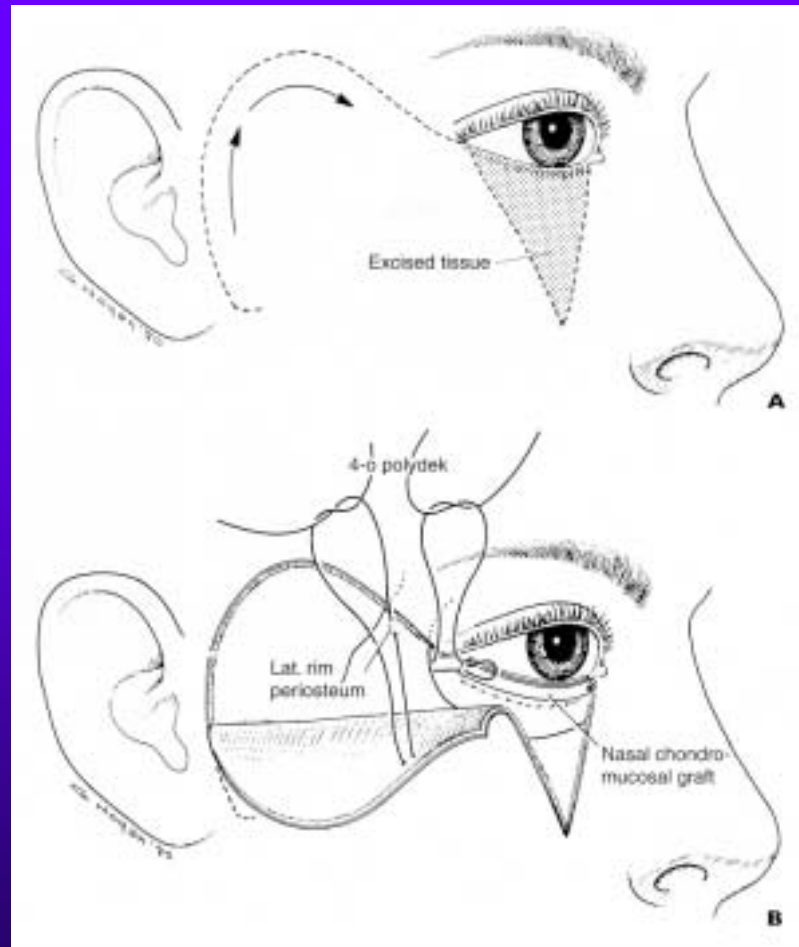




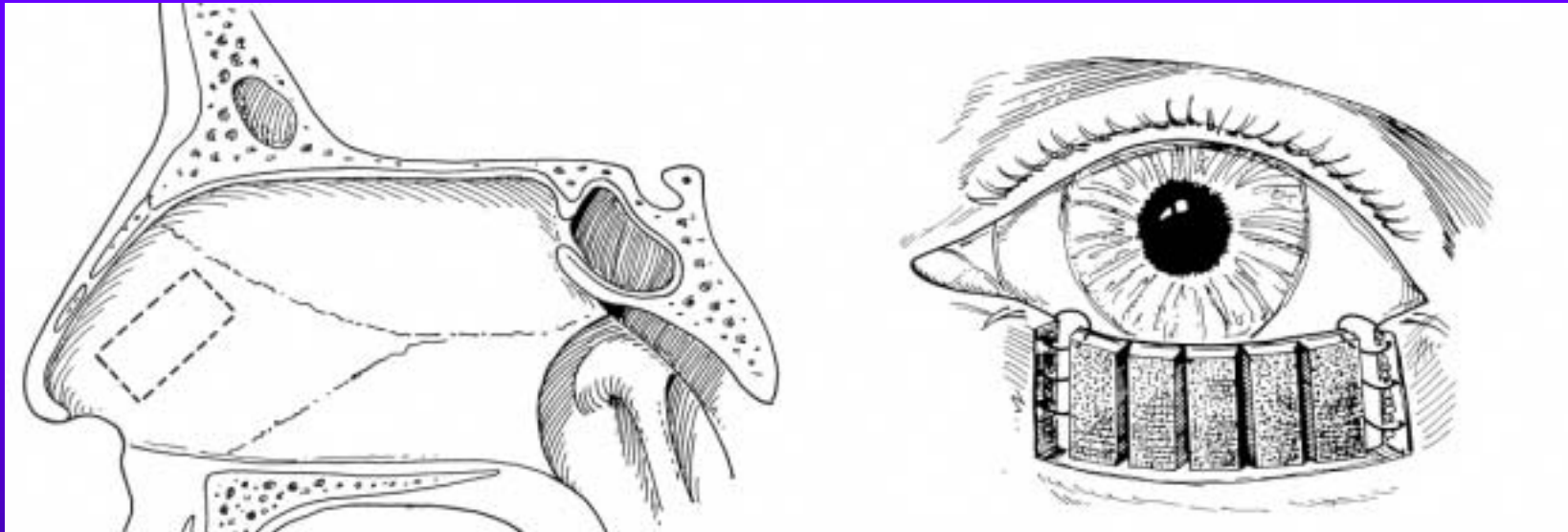
Mustarde Rotational Cheek Flap

- ◆ Good for very large defects
- ◆ Advantage – single stage procedure
- ◆ Preferable for patients with:
 - Monocular vision
 - Children with amblyopia
 - Active corneal disease
 - Glaucoma
- ◆ Disadvantages – lacks orbicularis, sagging

Mustarde Technique



Mustarde Technique

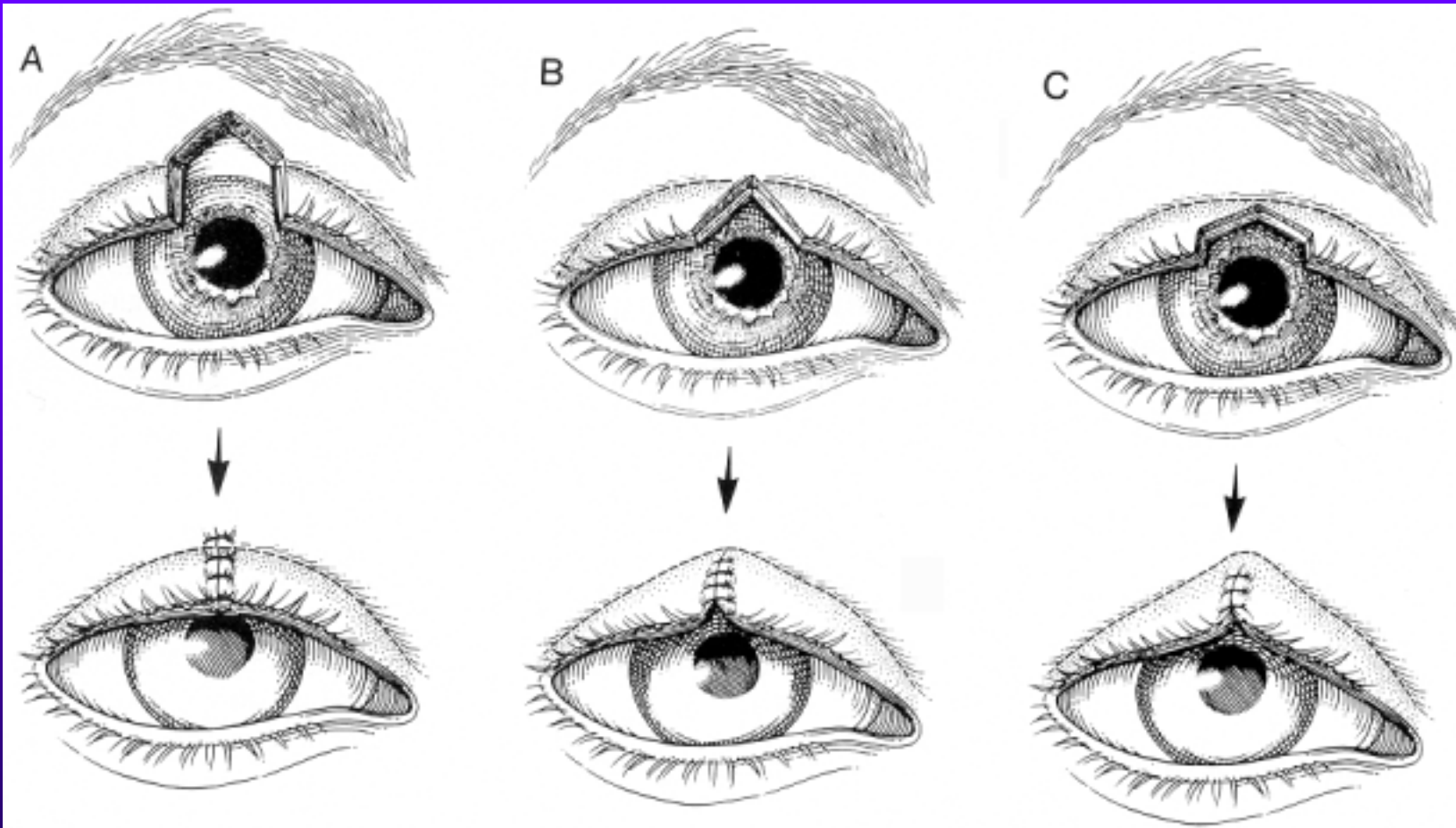




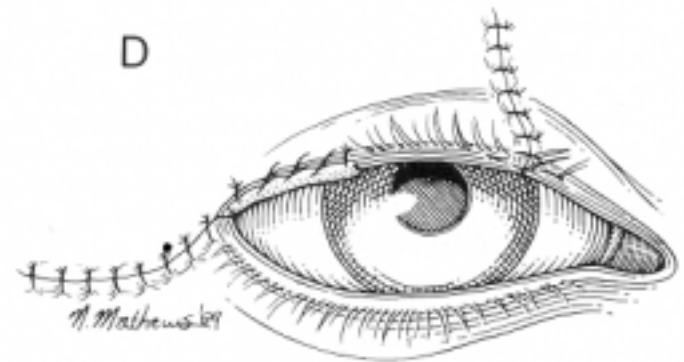
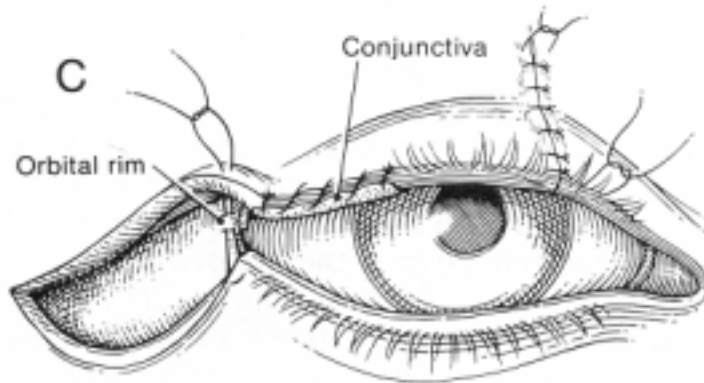
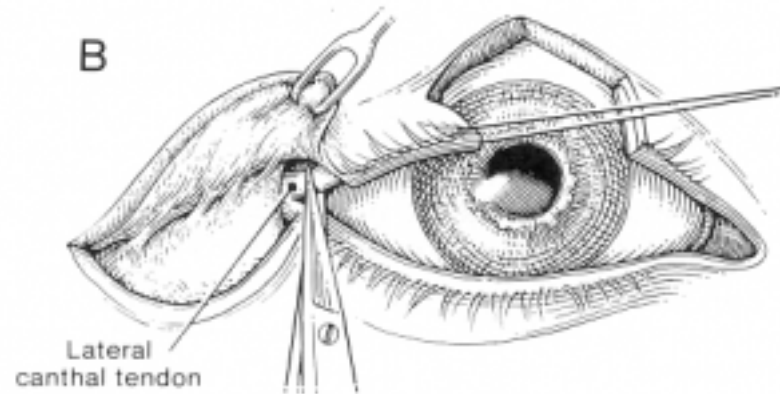
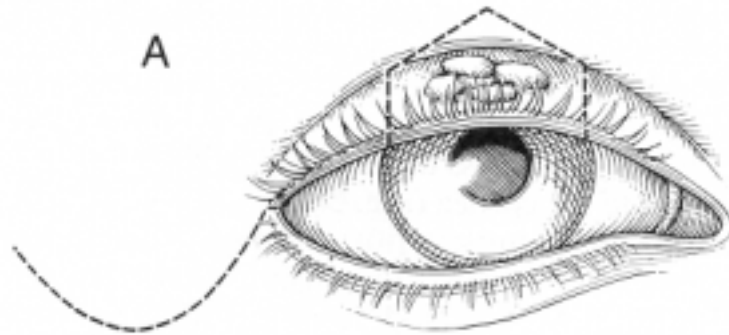
Upper Eyelid Reconstruction

- ◆ Direct Closure +/- lateral cantholysis
- ◆ Tenzel Flap
- ◆ Sliding Tarsoconjunctival Flap
- ◆ Posterior Lamellar Graft with local myocutaneous flap
- ◆ Cutler-Beard (Bridge) Flap

Direct Closure



Tenzel Flap

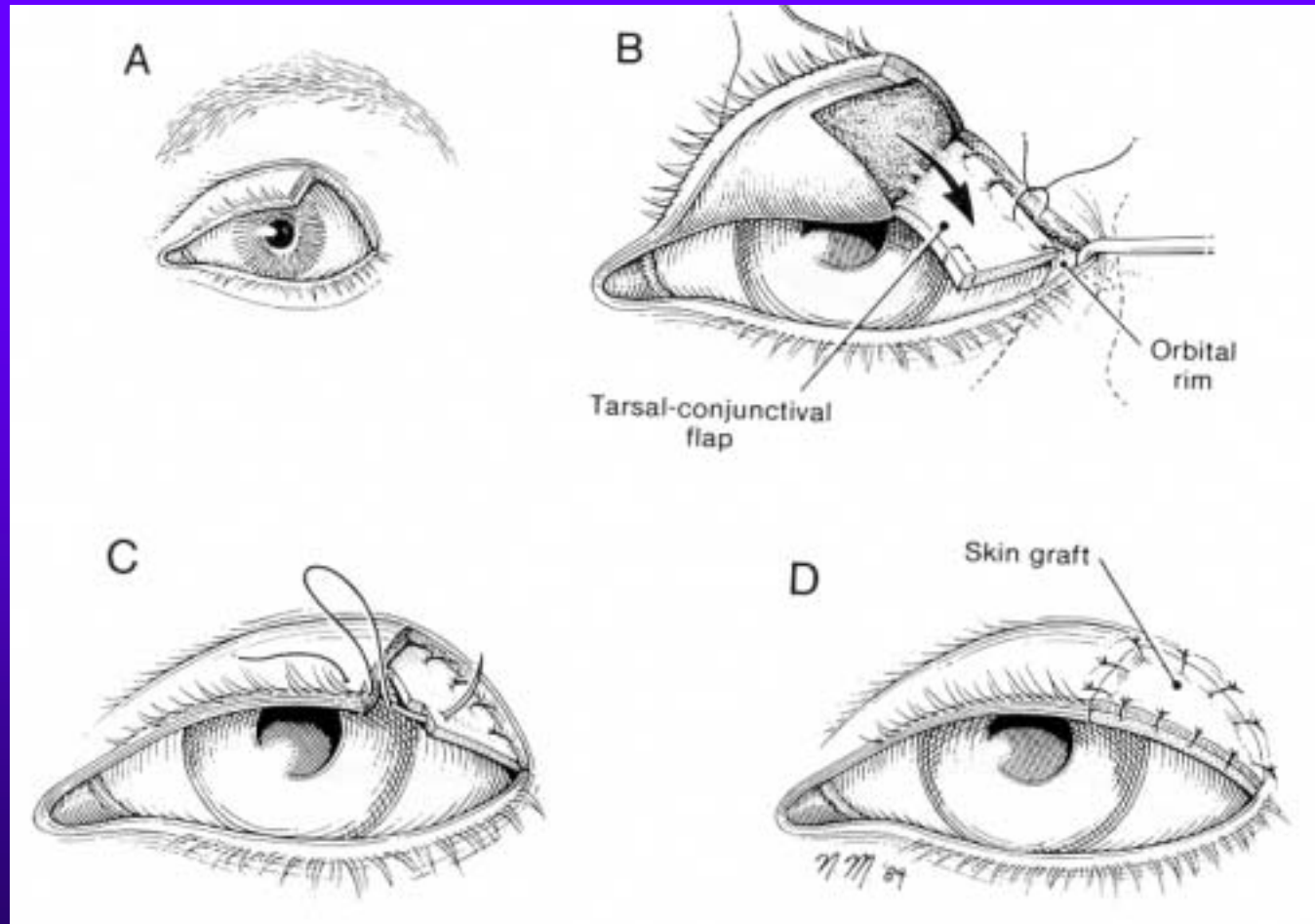




Sliding Tarsconjunctival Flap

- ◆ Isolated medial or lateral lid defects
- ◆ Borrows a sliding portion of remaining lid segment for posterior lamella
- ◆ Anterior lamella repaired with skin graft or local myocutaneous advancement flap

Sliding Tarsalconjunctival Flap

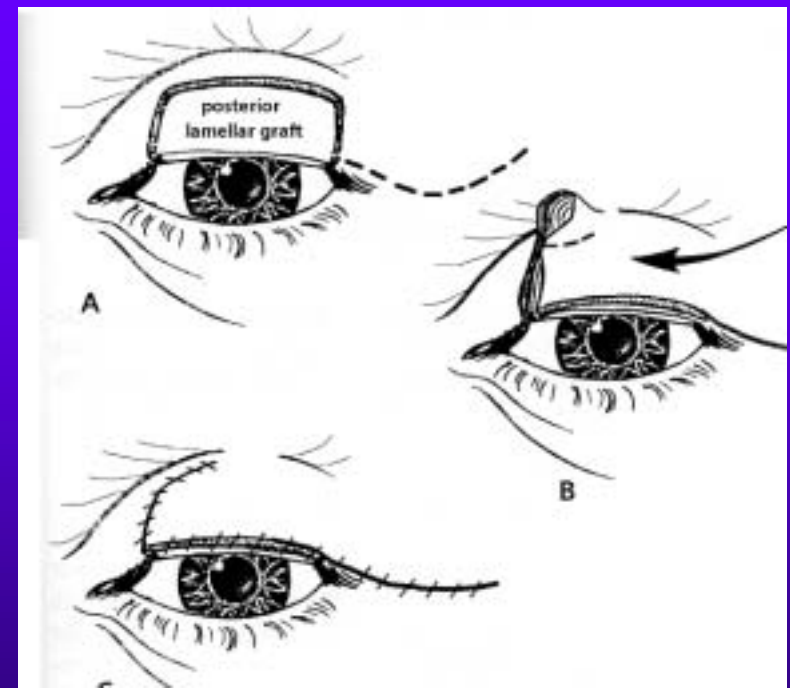
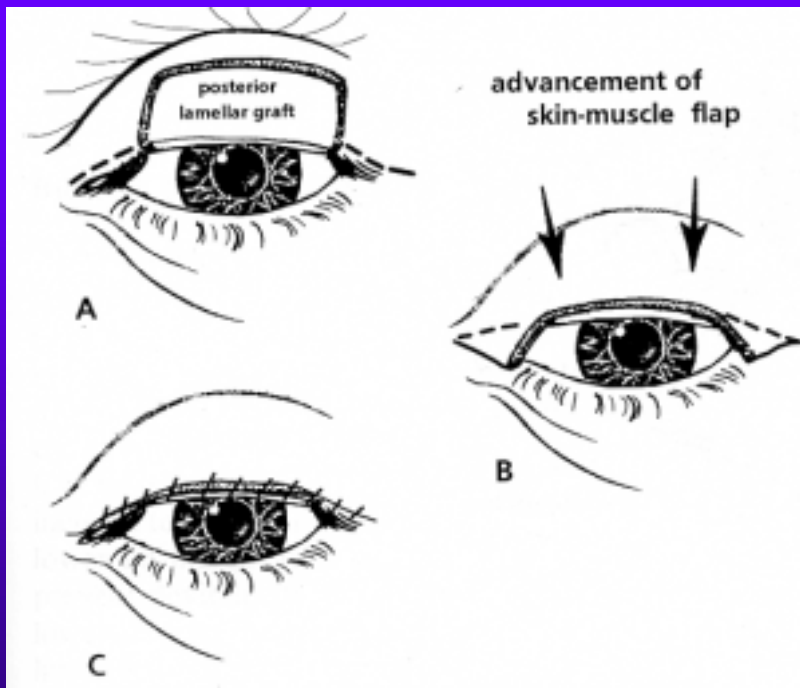




Posterior Lamellar Graft with Local Myocutaneous Flap

- ◆ Good for patients with skin laxity or redundancy
- ◆ Posterior lamella defect
 - Conjunctival advancement (upper fornix, lower lid)
 - Supplement with ear cartilage
- ◆ Anterior lamella
 - Myocutaneous flap for blood supply

Posterior Lamellar Graft with Local Myocutaneous Flap

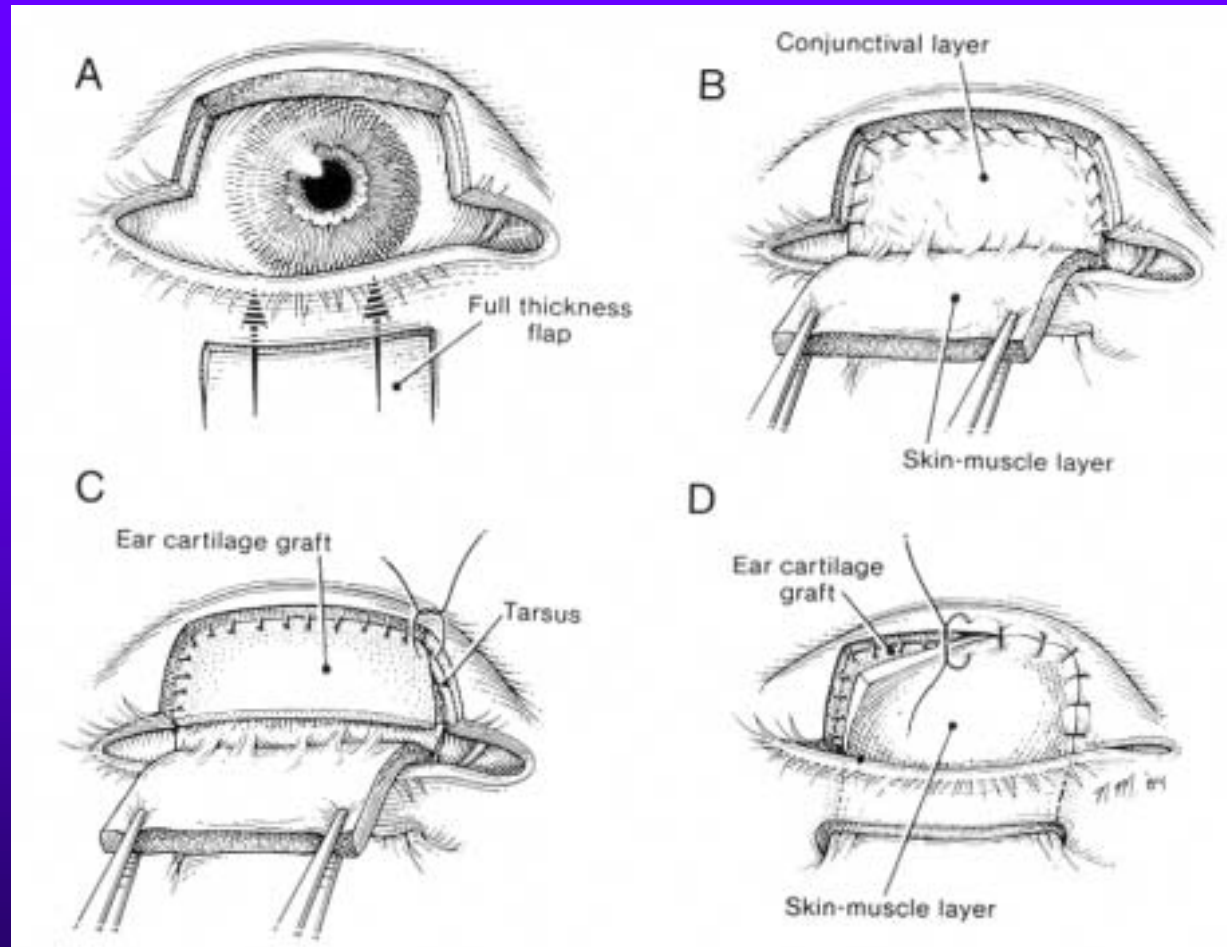




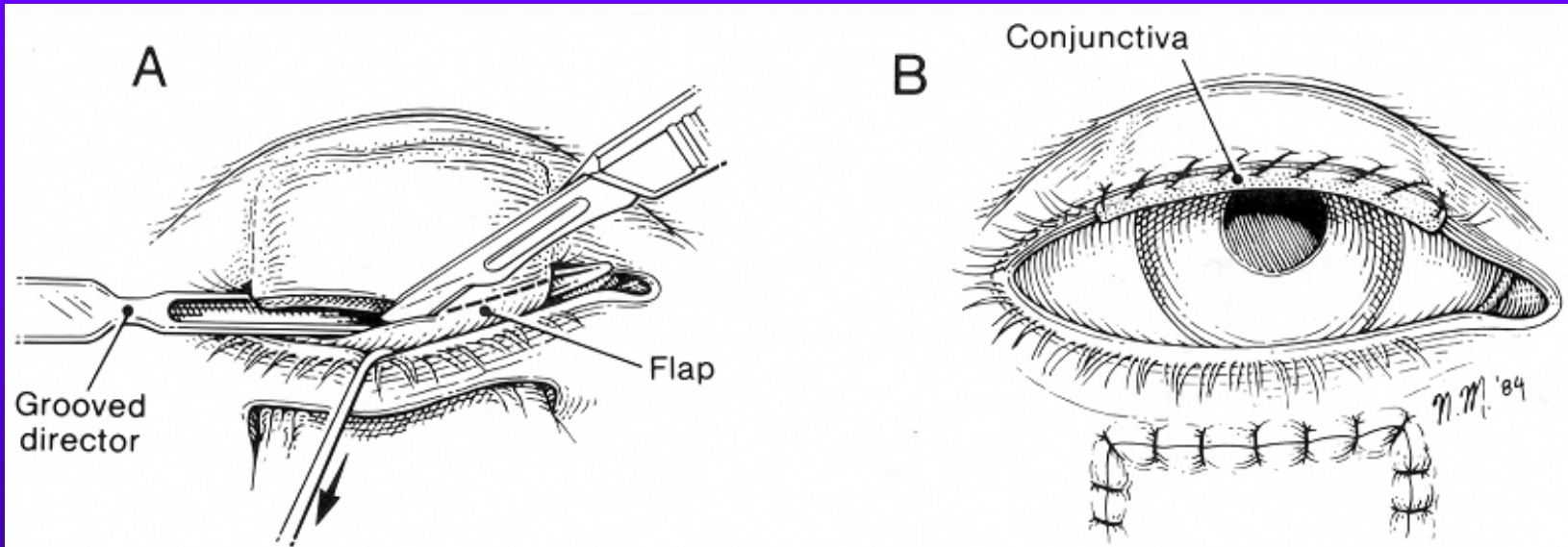
Cutler-Beard (Bridge) Flap

- ◆ Used for 60% to entire lid defects
- ◆ Borrows skin, muscle and conjunctiva from lower eyelid
- ◆ Autogeneous cartilage to provide support
- ◆ Requires 2nd stage procedure

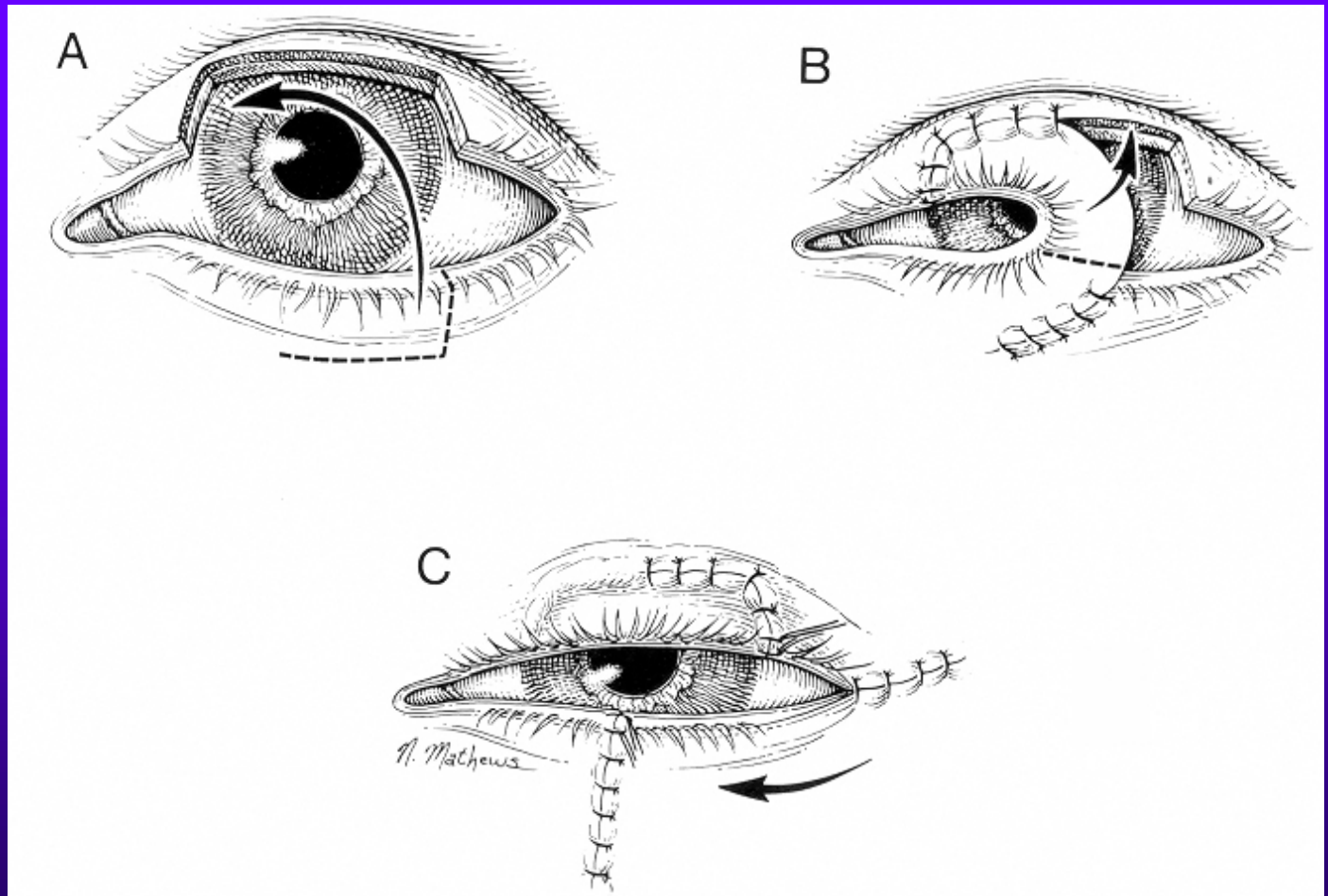
Cutler-Beard (Bridge) Flap



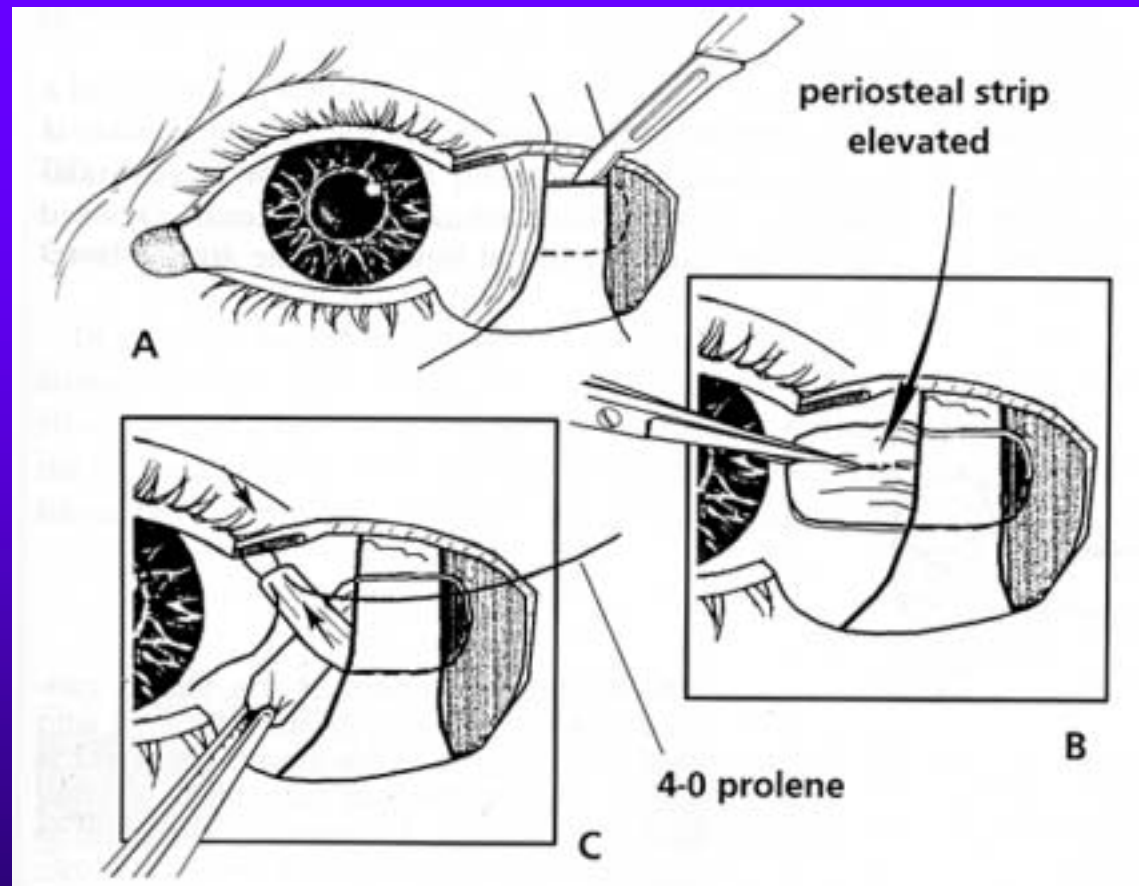
Cutler-Beard (Bridge) Flap – 2nd Stage Procedure



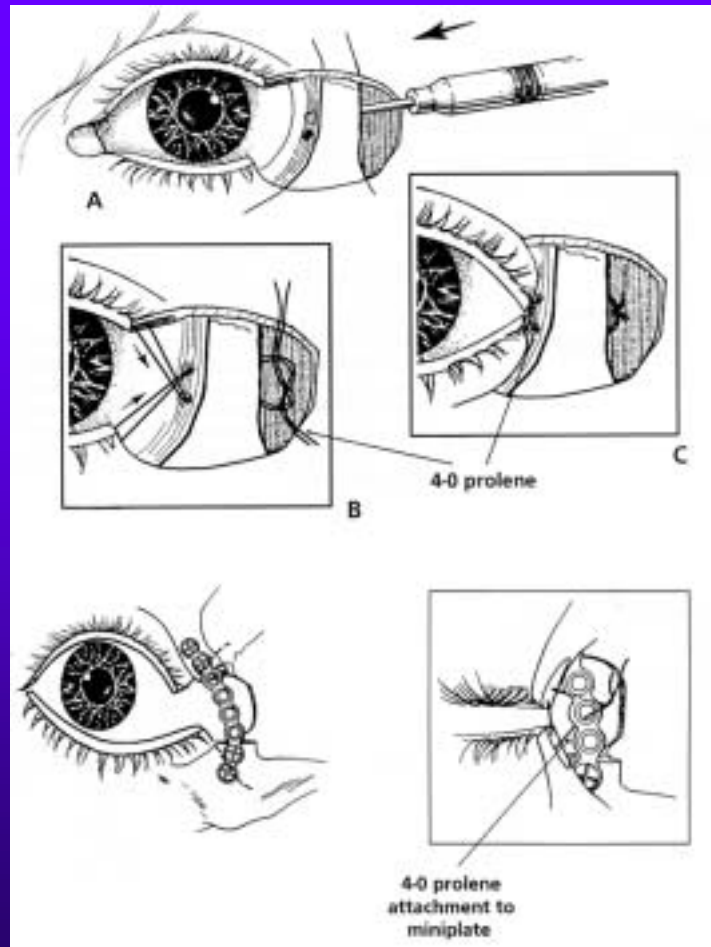
Pedicle Flap From Lower Lid



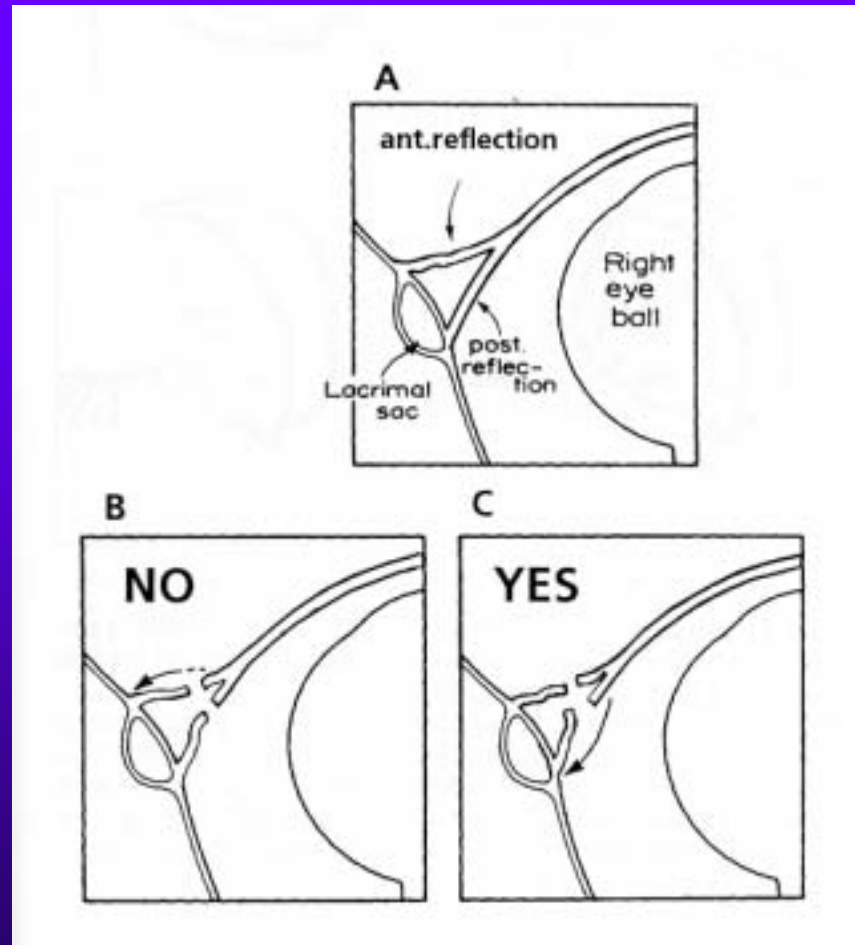
Lateral Canthal Reconstruction



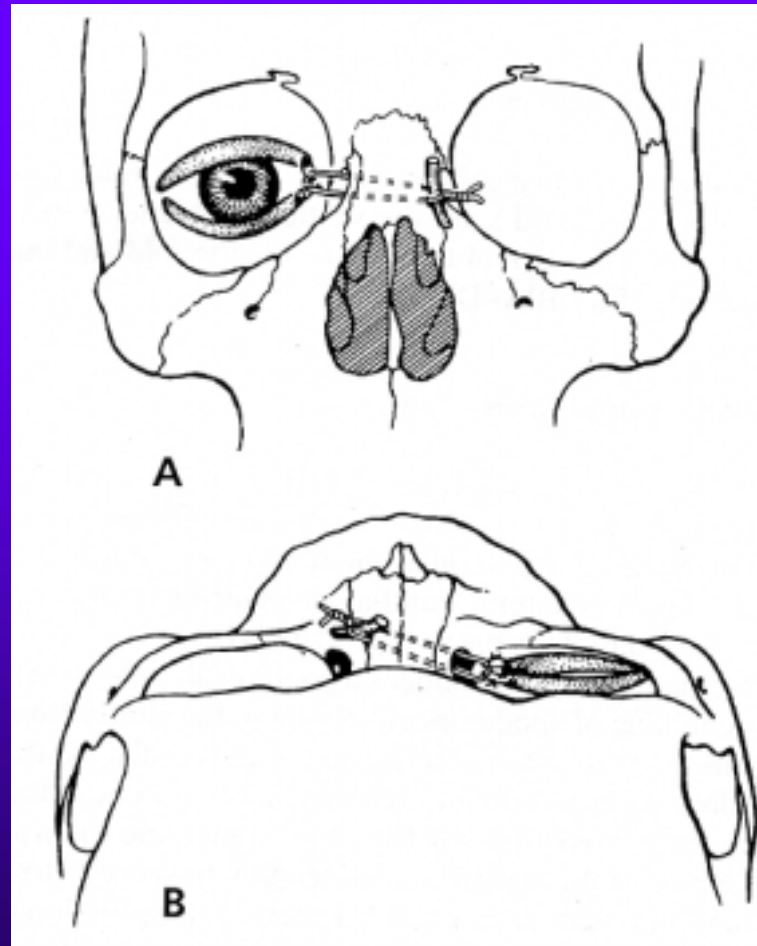
Lateral Canthal Reconstruction



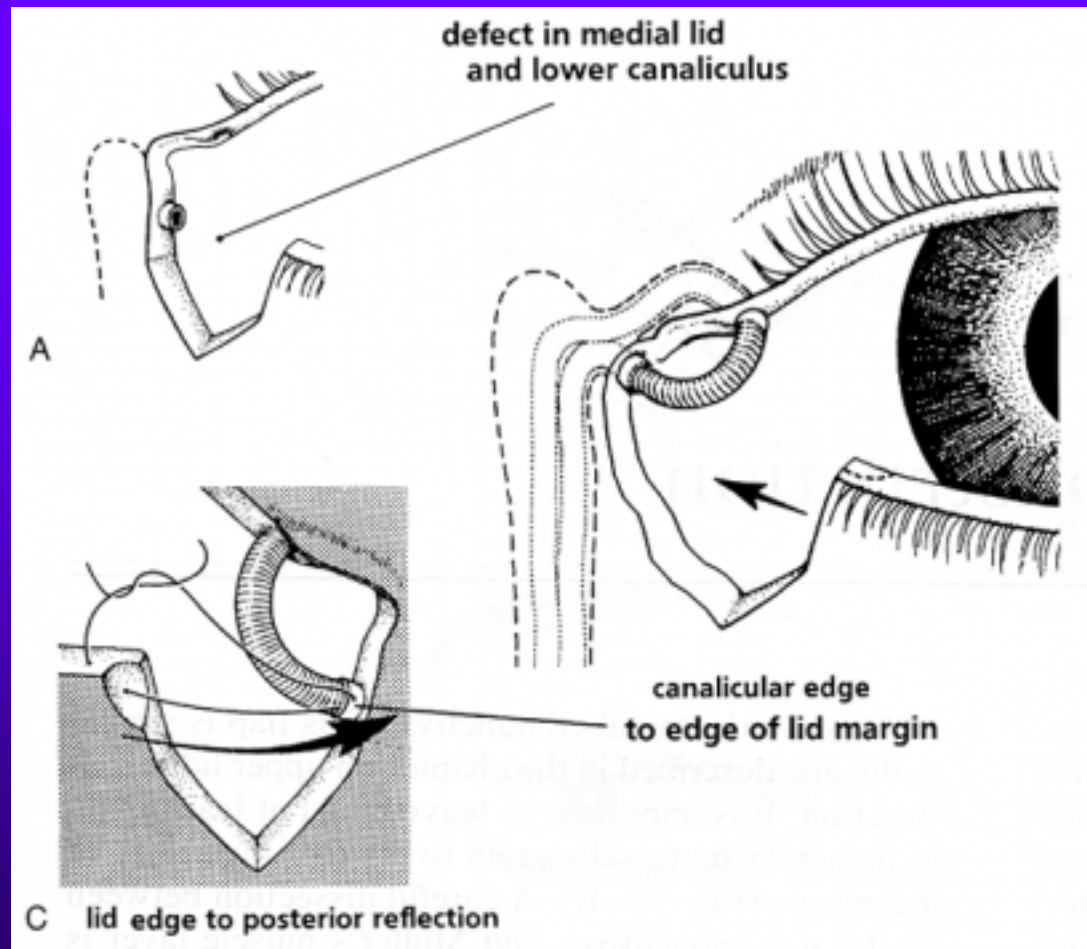
Medial Canthal Reconstruction



Medial Canthal Reconstruction



Medial Canthal Reconstruction



Decision Making



FIGURE 17-17 Clinical pathway—management of full-thickness upper eyelid defects.

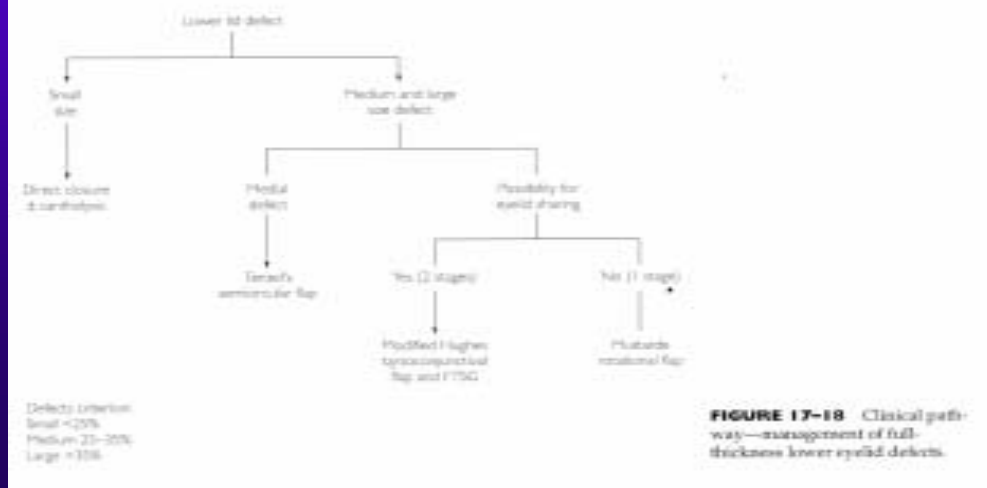


FIGURE 17-18 Clinical pathway—management of full-thickness lower eyelid defects.



Conclusion

- ◆ Thorough understanding of eyelid anatomy
- ◆ Understand basic techniques of repair
- ◆ Challenging problem do to complex nature of eyelid anatomy
- ◆ Careful attention to detail with delicate surgical technique required



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