

18th International Conference of the
Research Institute of Ophthalmology

RIO 2026

22 -23 JANUARY 2026
ROYAL MAXIM PALACE KEMPINSKI, CAIRO

Surgical Anatomy Tips in Strabismus surgery

Key anatomical considerations for safe
and effective strabismus surgery

Presented by :

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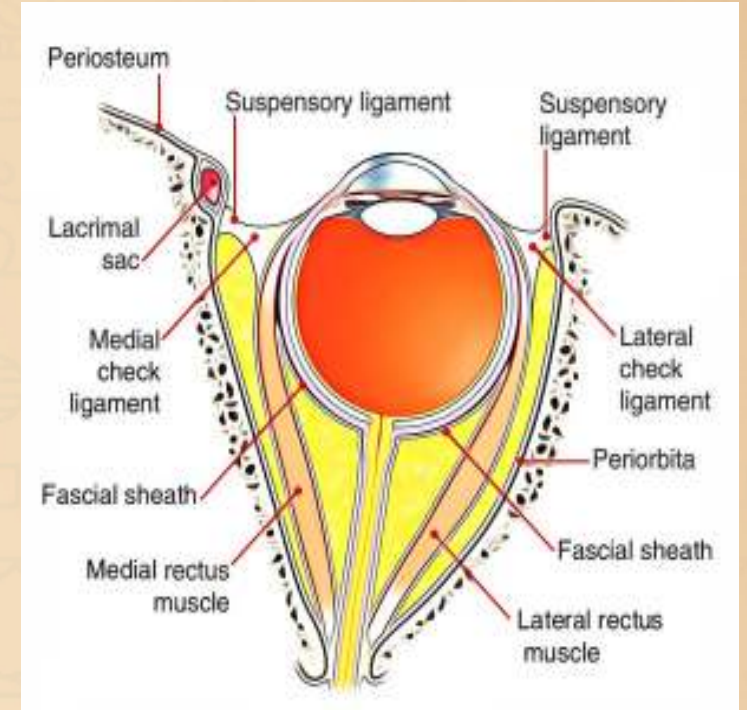
Objectives

- Review orbital and extraocular muscle anatomy
- Highlight surgical landmarks relevant to strabismus surgery
- Identify structures at risk during common procedures
- Provide practical anatomy-based surgical tips

Orbital Anatomy Overview

Orbit is a pyramidal cavity with apex posteriorly

- Extraocular muscles originate from annulus of Zinn (except inferior oblique)
- Globe suspended by muscles, Tenon's capsule, and fascial system
- Understanding spatial relationships is critical for safe dissection



Tenon's Capsule

Fibrous sheath surrounding the globe

- Separates globe from orbital fat
- Proper dissection of tenon's capsule minimizes bleeding and fat prolapse
- Staying within the tenon's plane avoids fat adherence
- Incomplete closure may contribute to postoperative

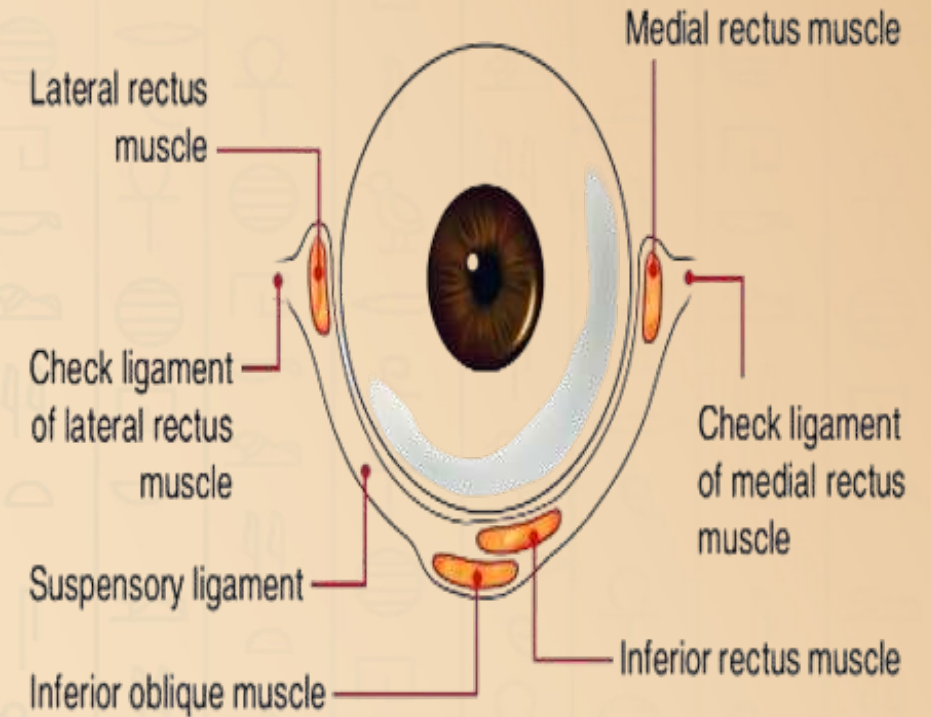
scarring

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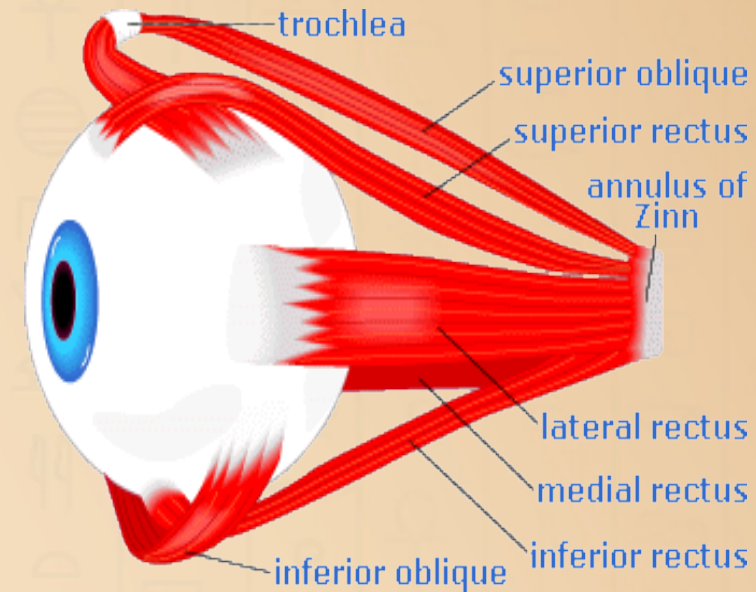
Check Ligaments and Fascial System

- Medial and lateral check ligaments are expansions of IO sheath
- Inferior rectus + IO sheath = Lockwood's ligament
- IR sheath is capsulopalpebral fascia
- Dissection of these structures may be needed in large recessions
- Over dissection can alter ocular motility



Extraocular Muscles – Recti

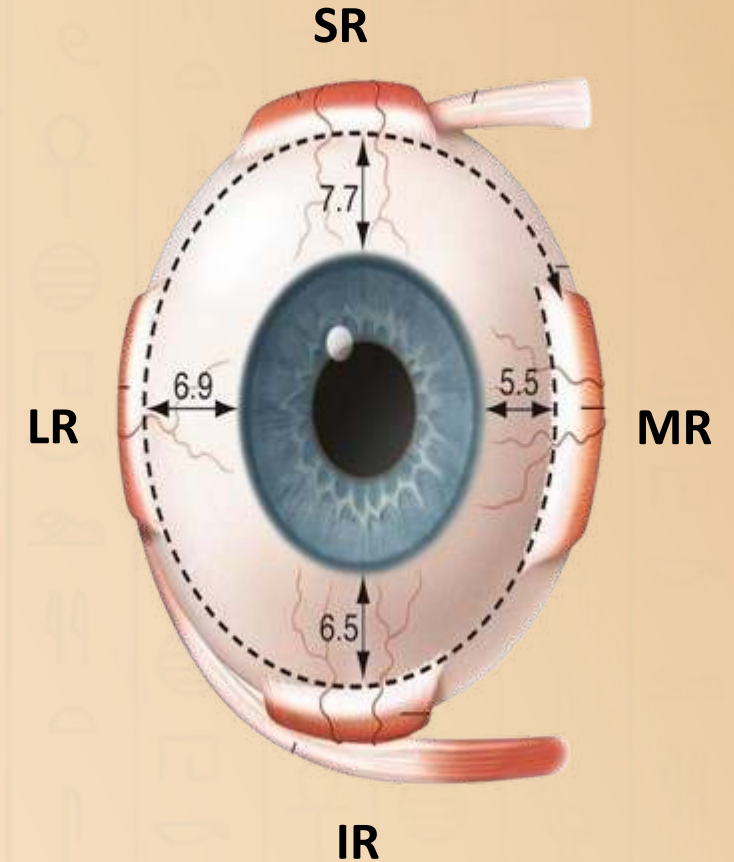
- All originates from the annulus of zinn
- Insert anterior to the equator in a spiral (Spiral of Tillaux)
- MR insertion closest to limbus 5.5mm (most common slipped and lost)
- SR farthest 7.7mm
- IR loosely attached to L.L retractors (affect lid position)



Spiral of Tillaux – Surgical Importance

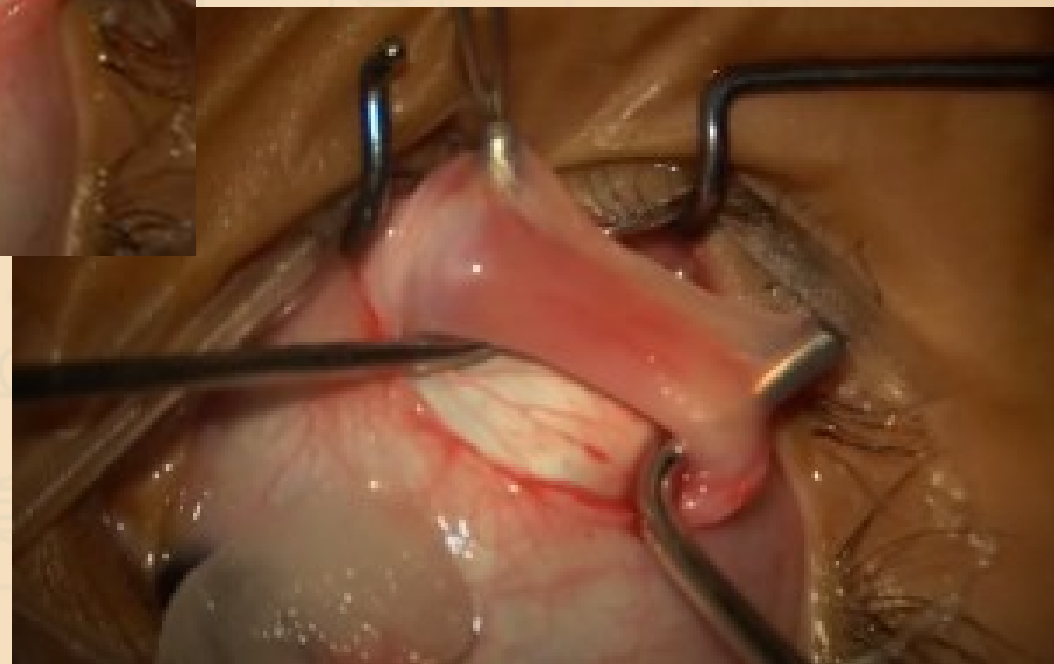
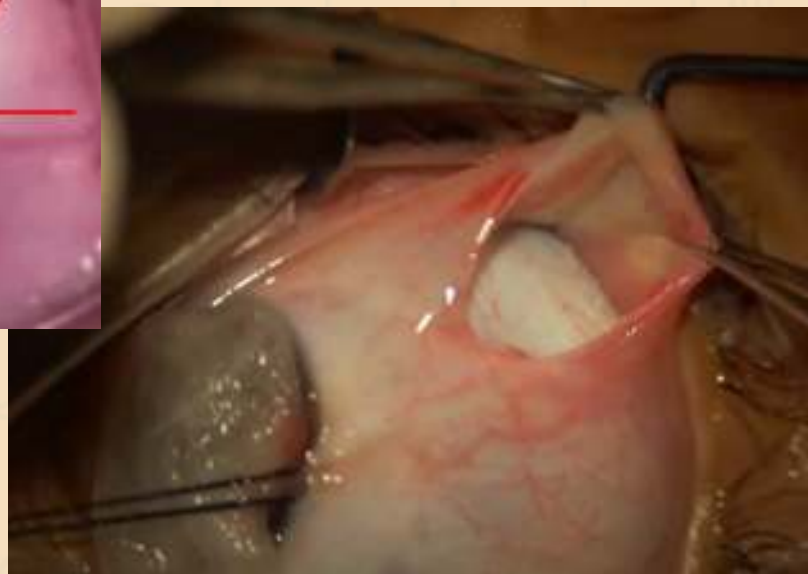
Describes the curved line of rectus muscle insertions

- Helps identify muscles during surgery
- Important for correct muscle identification before recession/resection
- Useful landmark when anatomy is distorted (re-operations)
- Thinnest part of the sclera (risk of scleral perforation)



Extraocular Muscles – Obliques

- Superior oblique passes through trochlea before inserting posteriorly
- Inferior oblique originates from maxillary bone, not annulus of Zinn
- Inferior oblique lies close to inferior rectus – risk of iatrogenic damage or hooking of wrong muscle

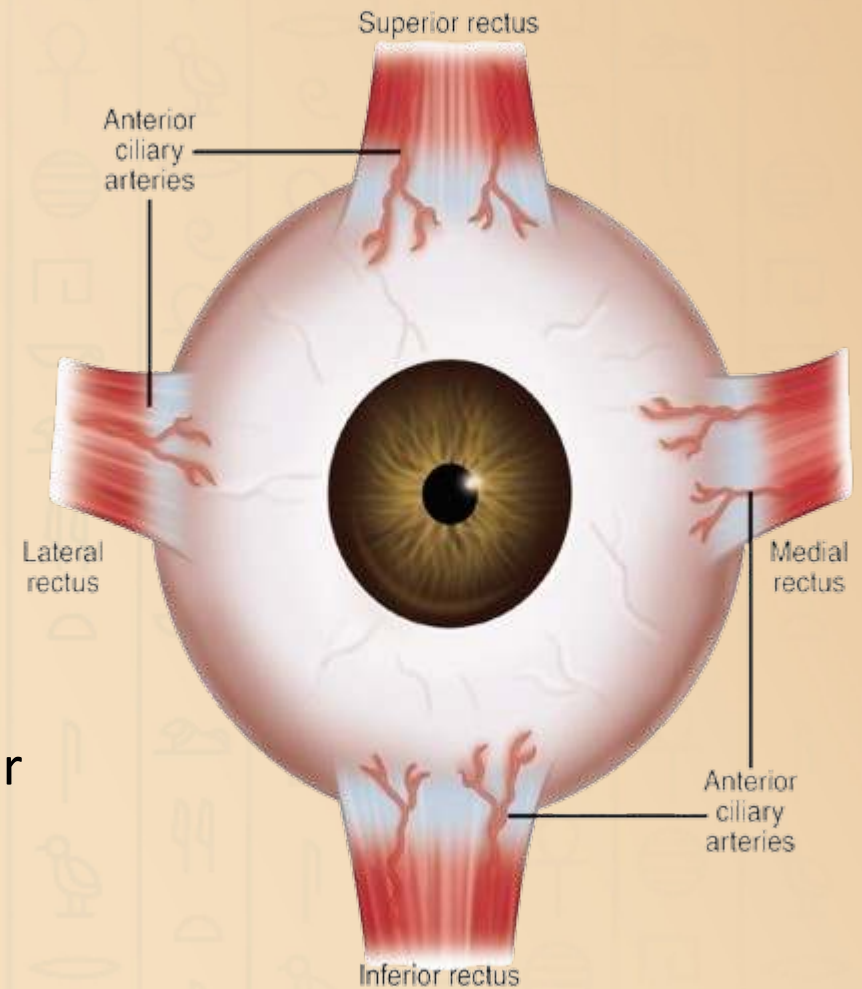


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Blood Supply

Anterior ciliary arteries accompany rectus muscles

- Risk of anterior segment ischemia increases with surgery on multiple rectus muscles
- Multiple muscle surgeries increase risk of anterior segment ischemia
- Vertical rectus muscles contribute more to anterior segment circulation
- Staged procedures reduce ischemic risk



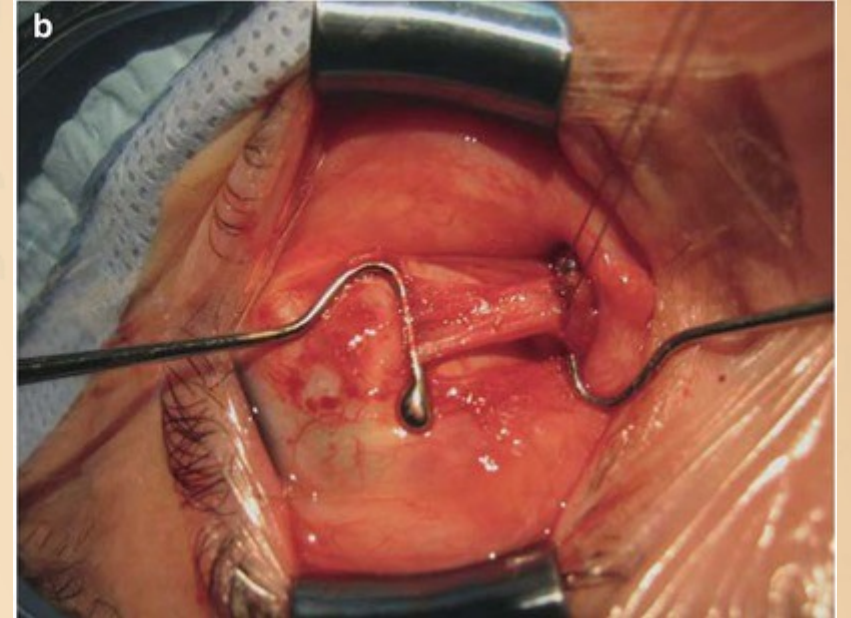
Nerve Anatomy

- Oculomotor nerve supplies most extraocular muscle
- Trochlear nerve supplies superior oblique
- Abducens nerve supplies lateral rectus
- Deep posterior dissection risks nerve injury



Re-operations and Scarred Anatomy

- Normal anatomical planes may be distorted
- Muscles may be recessed , slipped or reattached via stretched scar
- Expect adhesions between muscle, sclera, and Tenon's capsule
- Careful blunt dissection is required
- Preoperative records help anticipate altered anatomy



Pediatric surgical anatomy

- More anterior muscle insertion
- Tissues are thinner and more elastic
- Muscle capsule is poorly developed
- Higher risk for slippage
- Surgical tips: securing locking bites and gentle tissue handling

Neurovascular structures at risk

- Vortex veins at the equator (inferotemporal & superotemporal are the most vulnerable)
- Ciliary ganglion lies behind LR
- Long posterior ciliary arteries at 3 & 9 O'clock

Common Anatomical Pitfalls

- Mistaking oblique muscle for rectus muscle
- Buttonholing sclera during deep passes
- Inadvertent fat prolapse due to Tenon's violation
- Failure to identify slipped or lost muscle



Take home message

- Know normal anatomy before entering the operating room
- Use consistent landmarks to identify muscles
- Respect Tenon's capsule and fascial planes
- Anticipate variations, especially in re-operations





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