Case Presentation:

- 61 year old man with active Graves’ orbitopathy
  - Visual acuity
    - 20/50 OD
    - 20/50 OS
    - Left RAPD
    - Bilateral optic disc edema
  - Treated with oral prednisone for 6 months
  - Orbital radiotherapy
  - Visual acuity unchanged 8 weeks after radiotherapy

Indications for orbital decompression in TED:

- Compressive optic neuropathy
  - Vision 20/50 or worse
  - Failed course of systemic steroids
  - Failed course of orbital radiation
  - Diabetic patient, unilateral proptosis
- Stable orbitopathy with significant proptosis
- Congestive orbitopathy
  - Kikkawa et al. ASOPRS 2010
  - CAS score improved from 6.4 to 1.14 (3 months)

Modern surgical techniques for orbital decompression in TED:

- Inferomedial
  - Caruncular approach + inferior fornix
  - Endoscopic
- Lateral wall
  - Upper lid crease
  - Lateral canthotomy
- Combination of the two approaches (e.g., Balanced decompression)
Inferomedial decompression:

- Decompression of posterior orbital floor and medial wall
  - Transcaruncular approach
    - Hidden incision
    - Exposes medial wall, orbital floor, roof

Caruncular approach:

Shorr et al. Ophthalmol 2000

Surgeon’s view:

Bony Landmarks in medial orbit:
A) Orbital strut B) Ethmoidal artery
Posterior bony landmarks:

Posterior inferomedial decompression through trans-caruncular incision:
Attributes:
- Hidden, non-cutaneous incision
- Shortened surgery times vs lateral wall
- Diplopia may occur in 10% of cases
Indications:
- Compressive optic neuropathy
- Stable proptosis

Compressive Optic Neuropathy:

Inferomedial orbital decompression:
Lateral wall decompression: surgical results

- 2000 Perry JD, Goldberg RA
  - 19 patients undergoing lateral wall decompression
  - 4.5 mm mean proptosis reduction
  - 7% new onset diplopia
- 2004 Simon BG, Goldberg RA
  - 201 decompressions performed at UCLA
  - 3.4 mm proptosis reduction
  - 2.6% new onset primary position diplopia

Deep lateral wall: anatomy

Critical anatomic landmarks:

Elements of successful lateral wall decompression:
- Preoperative planning
  - CT scan
- Two assistants
- Equipment
  - High speed drill
    - 2, 3 mm burrs (acorn cutting, diamond polishing)
- Advantage:
  - Lower rate of diplopia vs inferomedial approach
- Disadvantage:
  - Not effective for compressive optic neuropathy
Summary: My recommendations

- Surgical options for decompression in 2010
  - Inferomedial through trans-caruncular or endoscopic approach
    - Useful for both compressive optic neuropathy and stable orbitopathy
  - Deep lateral wall
    - Lower diplopia rates
    - Useful for stable orbitopathy
  - Balanced decompression with both approaches when >4 mm of proptosis reduction needed

Orbital fat decompression:

- Olivari N. PRS 1991
  - 6 cc of fat removed resulting in avg 5.9 mm of proptosis reduction (3.5% rate of new diplopia)
- Trokel et al. Ophthalmology 1993
  - Only 1.8 mm of avg proptosis reduction
- Wu, et al AJO 2008
  - Average 3.6 mm of proptosis reduction (2.8% diplopia)
  - Currently used to augment results when combined with bony decompression
    - Trans-caruncular - Inferomedial compartment
    - Lateral wall – inferolateral compartment
    - Not recommended for inflamed orbits.
Diplopic space in greater wing of sphenoid bone:

Deep lateral wall: greater wing of sphenoid bone

Inferior orbitotomy: transconjunctival approach

- Useful surgical planes
  - Septal plane, between fat pads and orbicularis
  - Within the fat pads
- Commitment to a precise surgical plane is the key

Surgical Plane= Color Change
Transconjunctival Approach: Achieving wide exposure

- Utilize a wide “open sky” incision
  - Caruncle to canthus
- Visualize the periorbita at the orbital rim

Anatomical Danger areas:

- Cornea
- Lid margin
- Canaliculus
- Medial fat pad
- Inferior oblique muscle

Transconjunctival approach: Surgical Pearls

- To maintain the same plane during dissection, follow the arc of the orbital fat pads
- Aim slightly anterior as dissect toward orbital rim
- Avoid skin perforation near orbital rim

Intra-septal plane:
Combined skin-skin/muscle flap: