Thyroid Lid Retraction

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Graves Ophthalmopathy

- TSH-R Abs (IGF-1) react with orbital fibroblasts
  - Release pro-inflammatory cytokines
  - Elaboration of GAGs, fluid imbibition, swelling EOMs
  - Activation pre-adipocyte fibroblasts, accumulation orbital fat
- Explains inflammation, proptosis, myopathy, optic neuropathy
- Does not explain eyelid retraction or Von Grafe's

Eye Findings
Bartley AJO 1996

- Eyelid retraction 90%
  - 75% at presentation
- Proptosis 62%
- Restrictive myopathy 43%
- Optic nerve dysfunction 6%
- Only 5% had all of the above

Graves Ophthalmopathy

- Upper Eyelid Retraction
  - Proptosis
  - Overaction Muller’s muscle
  - Contracture inferior rectus
  - Contracture & fibrosis of levator muscle
  - “Hyperfunction” of levator muscle
  - Adhesions of levator muscle to orbital soft tissues.
- Complex, multi-factorial
- **Proptosis**
  - Poor Correlation

Hertel 26 mm O.U.
C.T.- Markedly thickened EOMs
No lid retraction

Globe luxation
Hertel 28 mm O.U.
EOMs wnl- increased fat
No upper lid retraction

Unilateral lid retraction

Bilateral proptosis
RUL retraction, lid lag

2 mm L proptosis

Overaction Muller’s Muscle

- No systemic evidence increased “catecholamines”
- No pupillary dilation
- Often asymmetric or unilateral lid retraction
- Lid retraction persists in euthyroid state

Contracture of inferior rectus

- Tight I.R. requires overinnervation of yoke S.R. and levator to get eye to primary position.
- Fails to explain eyelid retraction in patients with normal elevation.

L hypotropia due to tight I.R.
Attempt to overcome L hypo. produces LUL retraction

Attempted elevation exacerbates retraction

Retraction reduced in downgaze

Contracture & fibrosis of levator muscle
- Tends to occur late in disease while lid retraction presenting sign in 75%
- Levator excursion not usually reduced in eyelid retraction
- Orbital imaging- S.R not always enlarged

Orbital imaging often “normal” despite lid retraction, lag and proptosis
(NI TFS for 2 yrs, then TS Ig became +ve)
“Hyperfunction” of levator
- Frueh- Increased sarcomere length due to stretch
- Small- Hypertrophy individual muscle fibers

“Adhesions of levator to orbital soft tissues”
- Would expect decreased levator function, usually normal or increased

Management:
- Medical
  - Euthyroid
  - Radioactive iodine may exacerbate
  - Consider steroid prophylaxis
- ? Botox into Muellers
  - 2.5 to 5.0 u
  - Variable, temporary (1/3 of lift change)
  - May prevent keratopathy while wait to stabilize

Surgical-
- Decompression
  - May exacerbate upper lid retraction
  - Spare floor if large I.R.
  - Advance lateral rim
- Release tight inferior rectus
- Eyelid surgery

Decompression
“Balanced”, sparing floor when possible

Upper lid retraction worsened in 43% following trans-antral decompression
Fatourechi, Garrity, Bartley et al
Ophthalmology 1994
4 mm proptosis O.S.

LU and LL retraction

Valgus out fracture lateral wall
Mini-screw "doorstop"
Unilateral decompression, globe same plain as contralateral side

Consider release tight I.R., if retraction exacerbated in upgaze and diminished in downgaze

Position in downgaze suggests anticipated effect

s/p bilateral balanced decompression and fat removal

Retraction resolved with recession of I.R.s alone
Eyelid Surgery
- Euthyroid
- Decompressed
- Extra-ocular muscle surgery completed
- Stable for 6-9 months

Weaken Retractors
- Muller’s muscle
  - Recess
  - Exirpate
- Levator
  - Recess (+/- spacers)
  - Myotomy
- Release full thickness eyelid (Koorneef)

Upper Eyelid
- <2 mm
  - Posterior approach
  - Muller’s extirpation
- >2 mm
  - Anterior approach
  - En bloc recession levator aponeurosis, Muller’s & septum

Balloon conjunctiva
- Excise Muller’s (leave medial 10-15%)
- Inspect contour
- Resuture conjunctiva

Muller’s extirpation
Graves retractors - Levator, Mullers, and conj
Fibrosed into one unit

Inflammation, fibrosis extend full-thickness through lid
Severe, retraction, Hertel 22 O.U., C.T.-mixed fat, EOM increase

s/p full thickness release

Severe U.L. retraction, lagophthalmos

s/p full thickness release
RUL retraction

s/p full thickness release
s/p RUL ptosis

s/p full thickness resection

LUL retraction, stable 9 mos

Tight I.R., aligned in primary

s/p release LUL
initial overcorrection (25%)

3 mos. later
LUL stabilizes,
RUL retraction develops

New lag in downgaze

New lag in downgaze
9 mos later, released RUL.
Renewed LUL retraction!

Graves upper eyelid retraction

- Multi-factorial/often unknown
- Surgical challenge
  - Release tight I.R.
  - Decompression may exacerbate
  - Eyelid surgery-
    - Variable results, changes over time
    - Elevation eyelid crease common
- Full thickness release current fad (Koorneef)