NASOETHMOID COMPLEX FRACTURES
Pacific Rim Otolaryngology-Head and Neck Surgery Update
February 19, 2013

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NASOETHMOID COMPLEX FRACTURE

- NEC = NASOETHMOID COMPLEX
- NOE = NASO-ORBITAL ETHMOID
- A NASAL AND GLABELLA FRACTURE COMBINED WITH A MEDIAL ORBITAL FRACTURE
THE SINGLE GREATEST ADVANCE I’VE SEEN IN MIDFACE TRAUMA IS...

ORBIF ANATOMY
BONES THAT COMPRISE THE ORBIT

ORBIT ANATOMY
ANATOMY OF THE LACRIMAL SYSTEM

ANATOMY:
MEDIAL CANTHAL TENDON

- MCT inserts on the lacrimal bone
  - Anterior tendon inserts on the anterior lacrimal crest
  - Posterior tendon inserts on the posterior lacrimal crest
- Lacrimal duct lies between and is pumped with blinking (Jones pump)
SHOULD THIS HEAL WELL? YES!

ETIOLOGY
ASSESSMENT

• HISTORY
• PHYSICAL EXAM
  – RACOON’S EYES
  – TRAUMATIC TELECANTHUS
  – “BURST” LACERATION
  – MOBILITY OF THE NASAL SEGMENT
• IMAGING!

“TRAUMATIC TELECANTHUS”
BURST LACERATION

CHARACTERISTICS

- OFTEN OCCURS WITH OTHER FRACTURES
  - LEFORT- Anterior Open Bight Deformity
- DEPRESSED NASAL ROOT
- CREPITANCE
- KEY ISSUE IS MEDIAL CANTHAL TENDON POSITION AND COUNTERACTING ATTACHMENT LOSS
IMAGING IS KEY FOR OPERATIVE PLAN

- High Resolution CT Scan with Orbital Cuts
- Plain films are not helpful

"THE C SIGN"
**NOE CLASSIFICATION**
Markowitz-Manson

- **TYPE 1**
  - Central segment

- **TYPE 2**
  - Comminuted but canthal tendons attached

- **TYPE 3**
  - Comminuted but canthal tendons free

**NEC CLASSIFICATION**
J.S. Gruss, 1993

- Naso-orbital alone
- Naso-orbital + central maxilla
- Naso-orbital + LeFort II/III
- Naso-orbital + orbital dystopia
- Naso-orbital + loss of bone
BINARY NOE CLASSIFICATION

• A. MCT ATTACHED!
• B. MCT NOT ATTACHED!

OPERATIVE APPROACH

• 1. BICORONAL
• 2. THROUGH THE LACERATION
• 3. ANTERIOR ETHMOID APPROACH
  – Orbital incisions
  – Gingival buccal sulcus incision
  – Mid-facial degloving approach
  – “Open Sky”
ORBITAL INCISIONS

FIRST, THERE MUST BE REDUCTION…
ORIF: Historical Viewpoint
Bicoronal/Midfacial Degloving/Open Sky

BICORONAL
BICORONAL PLATING

MCT REPAIR

- Tessier – Tessier needle
- Raveh – cross wiring, with vector pulling posterior, superior
- Oculoplastic literature
- Manson classification
NEW TECHNIQUE
Modified from Procedure Developed by Salyer

• Repair medial orbit wall (bone or mesh)
• Chose desired location for fixating medial canthus
• 28 gauge wires passed in desired location, one wire superior and one inferior

MCT TECHNIQUE USING BICORONAL ACCESS

• Wires passed from orbit side of injury thru bone or mesh into sinus cavity and then pulled out nostril
• Wires then passed thru skin, 1 mm above and below medial canthus
• Nasal wires twisted together then pulled in lateral orbit direction to seat twist on medial surface of new canthus position
• 15 blade used to incise between wires extruding thru skin
• Forcep used to dissect down to medial canthus tendon
• External wires twisted together, medial canthus now secured to lateral surface of new canthus position
MCT POST OP POSITION

THROUGH LACERATION
ANTERIOR ETHMOID APPROACH

Special Topics

Bone Anchors
Ducic Y, Laryngoscope, 2001

Bone Grafts
Gruss JS, Annals of PS, 1986
CONCLUSION

• Frequently considered the most difficult injury to repair
• Very difficult to get adequate reduction, very difficult to over correct
• No universally accepted and “fool proof” method for reducing and fixating tendons in place