



Principles of Facial Trauma Care

Stephen Nogan, MD

Facial Plastic & Reconstructive Surgery

The Ohio State University

Email: stephen.nogan@osumc.edu

Office: (614) 366-8175

Cell: (724) 355-3264



THE OHIO STATE
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WEXNER MEDICAL CENTER

A little about me...

Cosmetic and reconstructive surgery of the face and neck:

Rhinoplasty/septoplasty

Facelift/minilift

Blepharoplasty

Brow lift

Otoplasty

Lasers

Peels

Implants

Scars

Facial paralysis

Fillers/botox

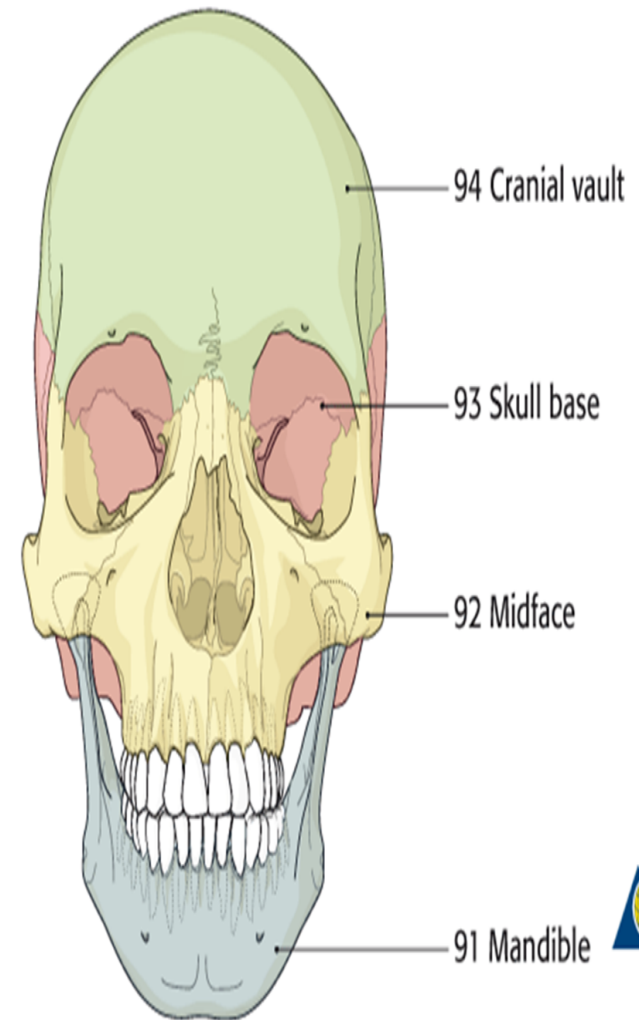
Skin cancer removal and repair

Bony and soft tissue injuries to the face



Objectives

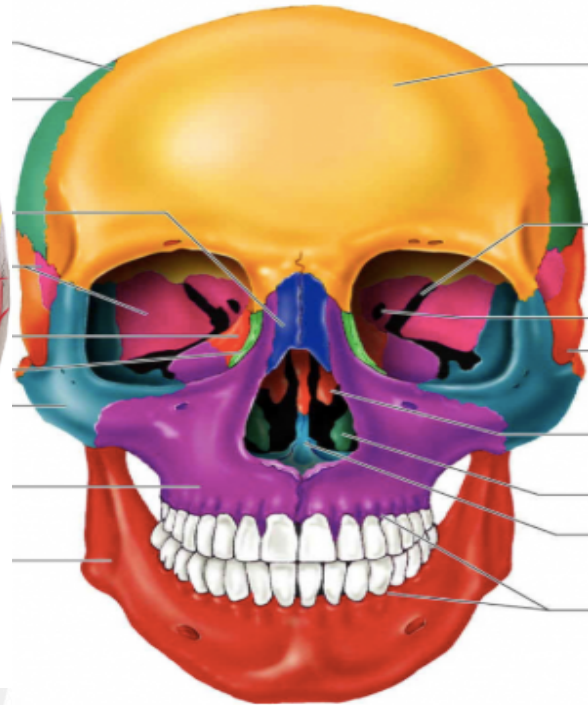
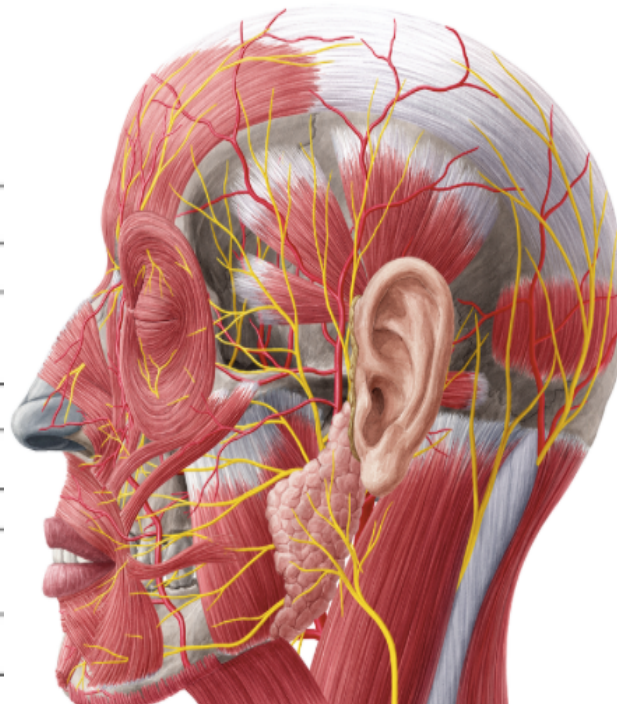
1. Be able to evaluate and manage injuries to the upper face
2. Be able to evaluate and manage injuries to the midface
3. Be able to evaluate and manage injuries to the lower face
4. **Discuss principles of management for bony and soft tissue injuries to the face**



Anatomic considerations for the face:

Skin / Muscle / Nerves / Vessels (soft tissues)

Bones



Principles of soft tissue management



Principles of soft tissue management



Principles of soft tissue management

Immediate management:

Define the defect

Irrigation

Debridement

Antibiotics (oral +/- topical)

Anesthesia (1% lidocaine w/ 1:100,000 epi)

Determine plan: Primary repair vs delayed?

Anatomic reapproximation of layers

5-0 or 6-0 nylon or prolene for skin (7-10 days)

Wound management if not amenable to repair

Adjuvant treatments

Primary repair



Primary repair



Adjuvant Treatments

Antibiotic ointment

Aquaphor

Sun protection

Lifestyle factors: diabetes, smoking, diet, etc

Scar cream/gel

Steroid injections

Lasers: pulsed dye and CO2

Scar excision / revision

Fillers

Adjuvant Treatments



Delayed repair



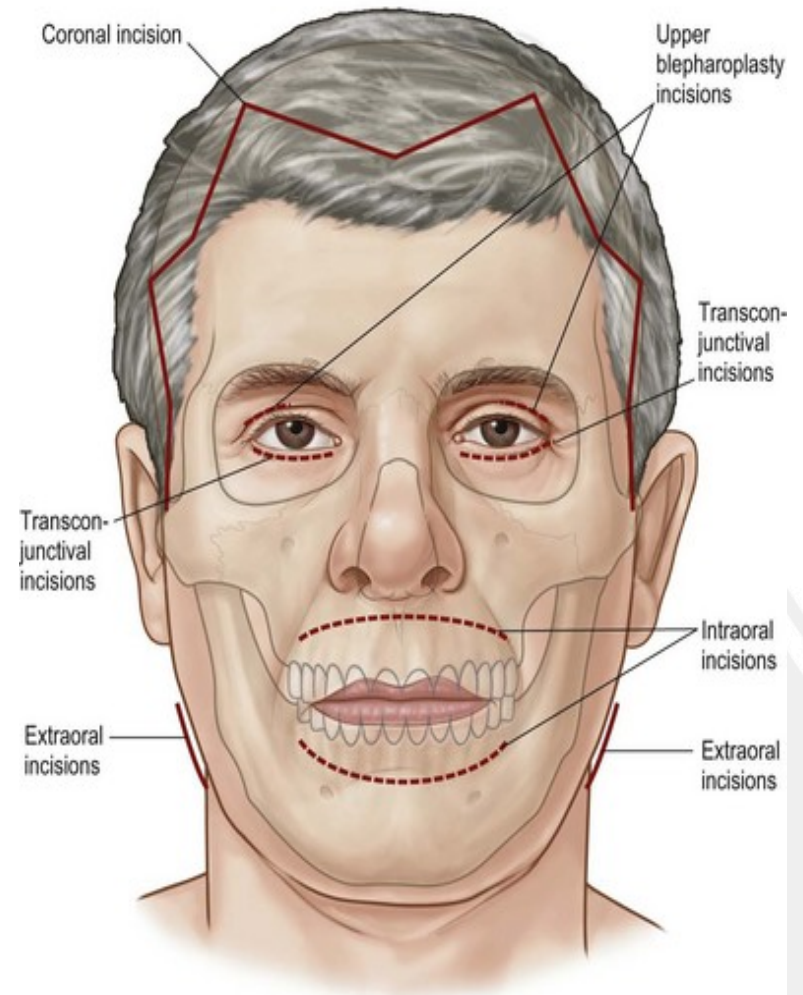
Wound Care: wet to dry dressings

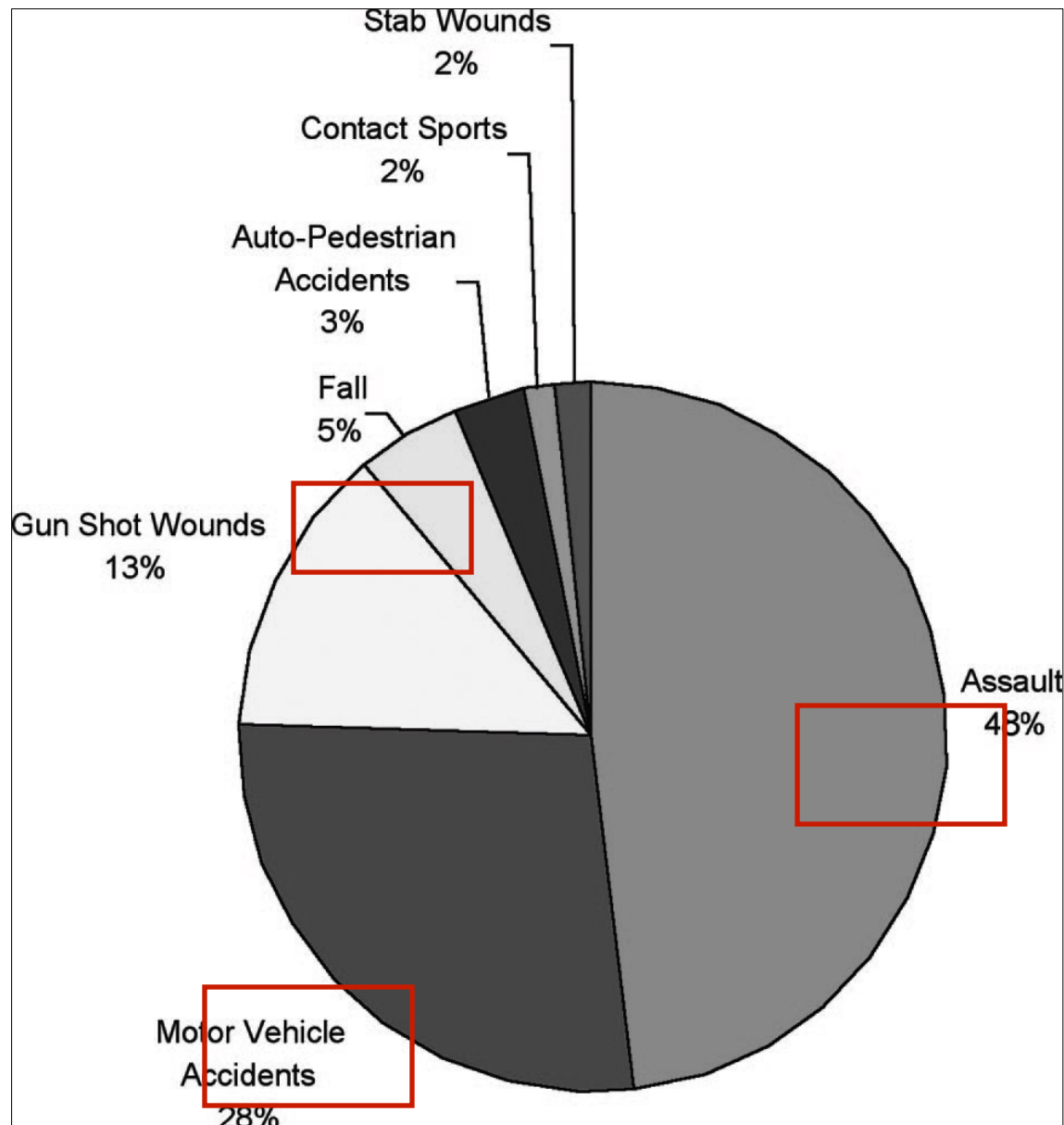


Delayed repair with local flap



Principles of bony management





Kelley P, Crawford M, Higuera S, et al. Two Hundred Ninety-Four Consecutive Facial Fractures in an Urban Trauma Center: Lessons Learned. *Plast Reconstr Surg* 116: 42e, 2005

Patient population

Often present at night

Sometimes intoxicated

Unhealthy lifestyle (wound healing)

Poor compliance to Rx recommendations

Often do not follow up

Challenging postoperative pain control

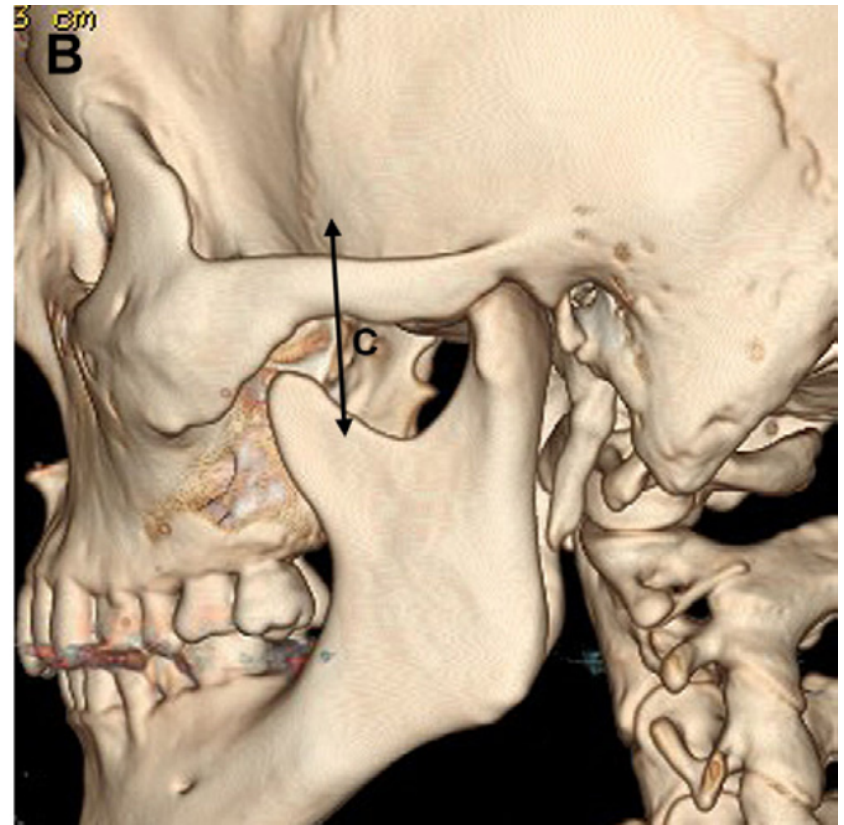
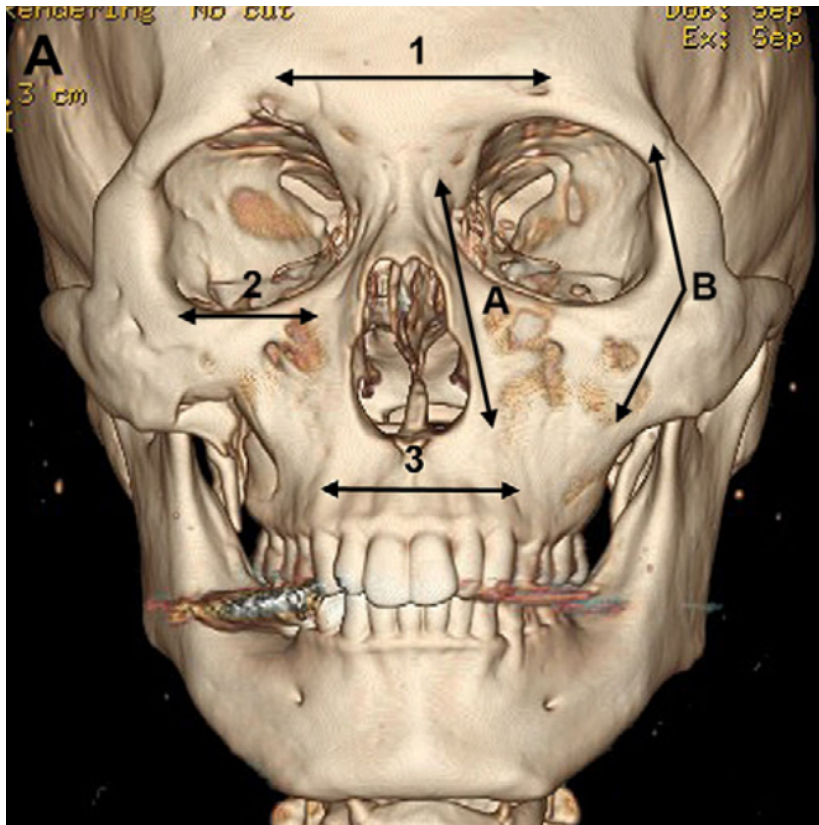
General Approach

Head and neck trauma surgeons
(avoid compartmentalization)

ATLS Initial evaluation and treatment

- Airway and C-spine stabilization
- Breathing
- Circulation
- Disability/neurologic assessment
- Exposure and environmental control

Buttress System



Vertical

A = Nasomaxillary

B = Zygomaticomaxillary

C = Pterygomaxillary

Horizontal

1 = Superior orbital rim

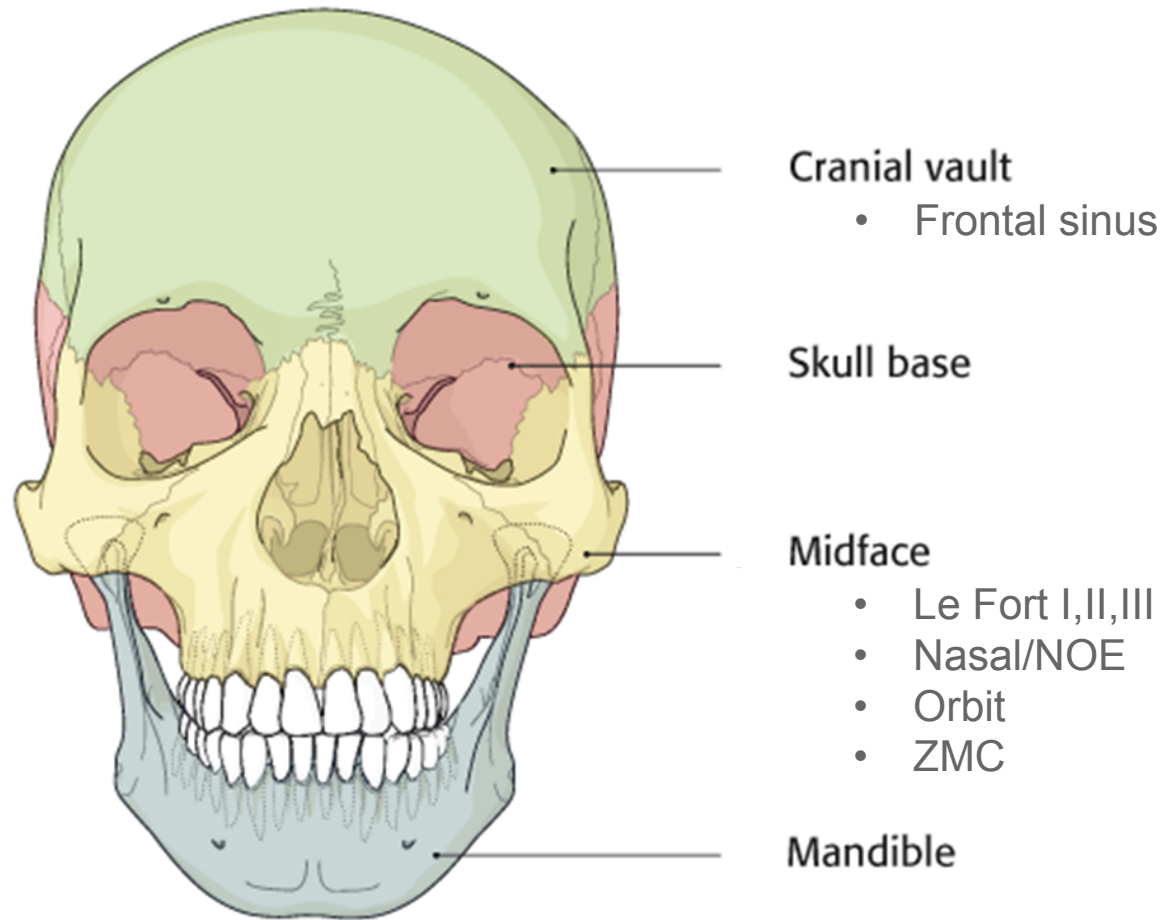
2 = Inferior orbital rim

3 = Alveolar ridge

Treatment Plan

- Diagnose the fracture (CT imaging, 3D if possible...)
- Consultations obtained
- Treatment options
 - Observation
 - Closed treatment
 - ORIF
- Surgical plan
 - Airway
 - Access
- Consent
 - Risks/benefits/alternatives
 - Fx treatment and incisions

Facial Fractures



Management of upper face fractures

Frontal sinus and orbital roof fractures:

FS develops at age 7-8; full size by puberty

Requires more force to fracture FS than any other facial bone

Anterior table bone: thick, resistant to fracture

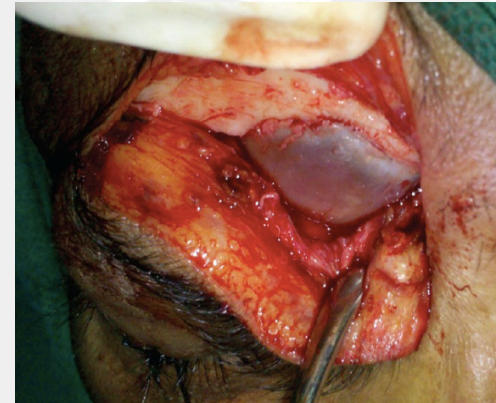
Fracture can result in cosmetic deformity and impaired sinus drainage

Posterior table bone: thin, susceptible to fracture, CSF/brain behind it

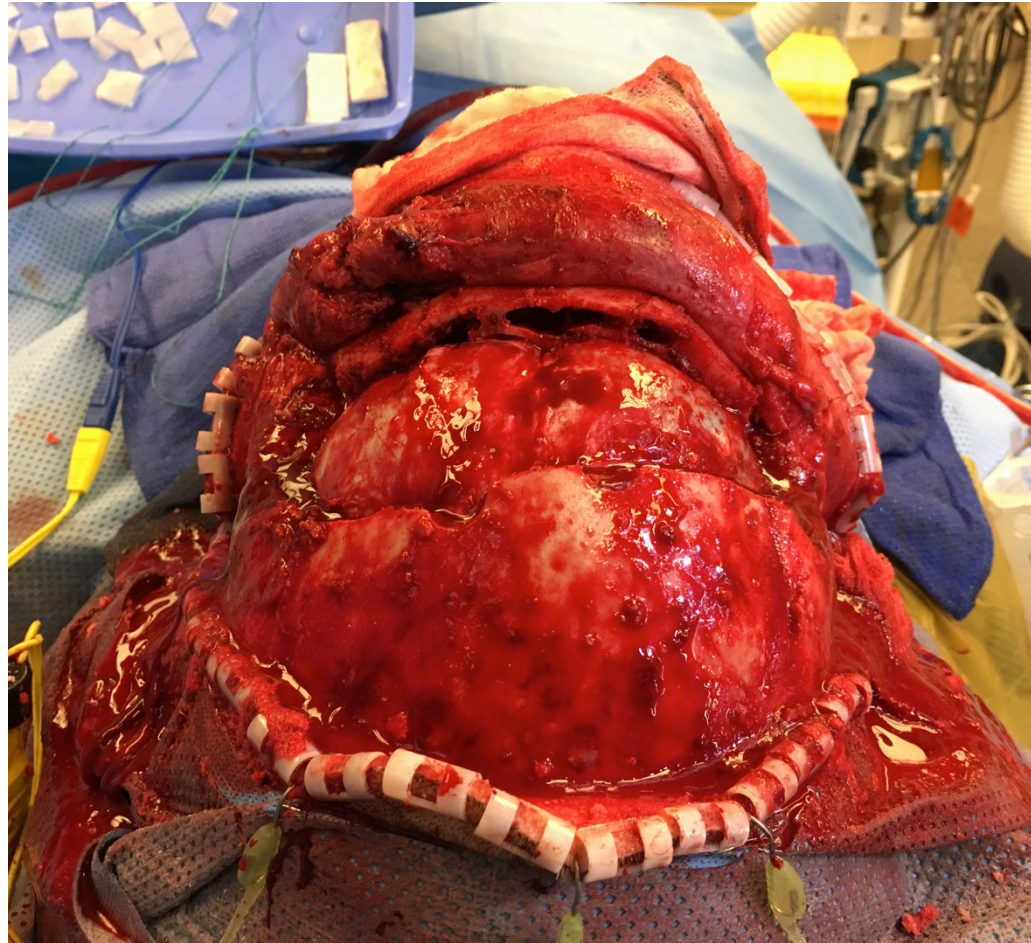
Can result in CSF leak, meningitis, brain abscess

Delayed complications include chronic sinusitis and mucocele

Treatment: observe, ORIF, obliterate, cranialize, endoscopes



Management of upper face fractures



Management of midface fractures

Anatomy

orbit, nose, zygoma

malar eminence is functionally and aesthetically important (buttresses)

4 suture lines: ZF, ZM, ZS, ZT

Evaluation

Vision/EOMs/globe position

Palpable step offs

Numbness

Nose: hematoma, obstruction, CSF

Ophtho consult

CT scan (orbit, pterygoids)

Approaches

Gingivobuccal, lateral brow, upper bleph,
transconj, Gillies, hemicoronal



Physical exam: midface mobility

Le Fort I



Le Fort II

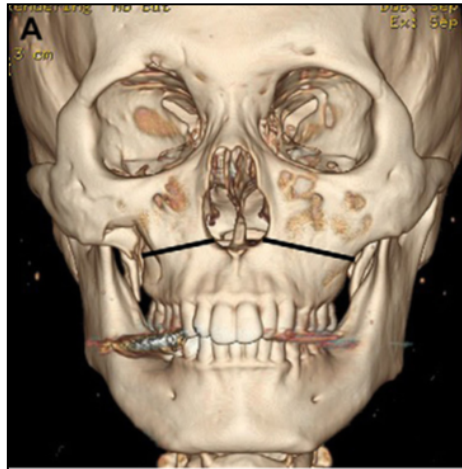


Le Fort III

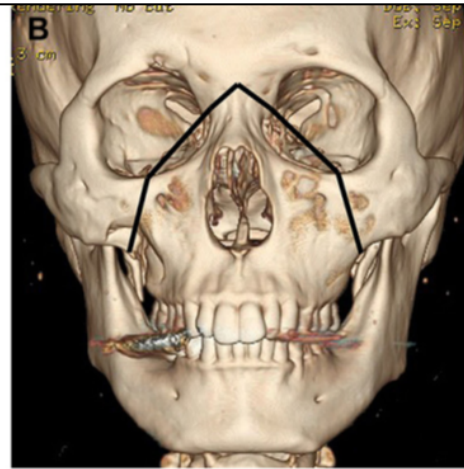


Lefort fractures

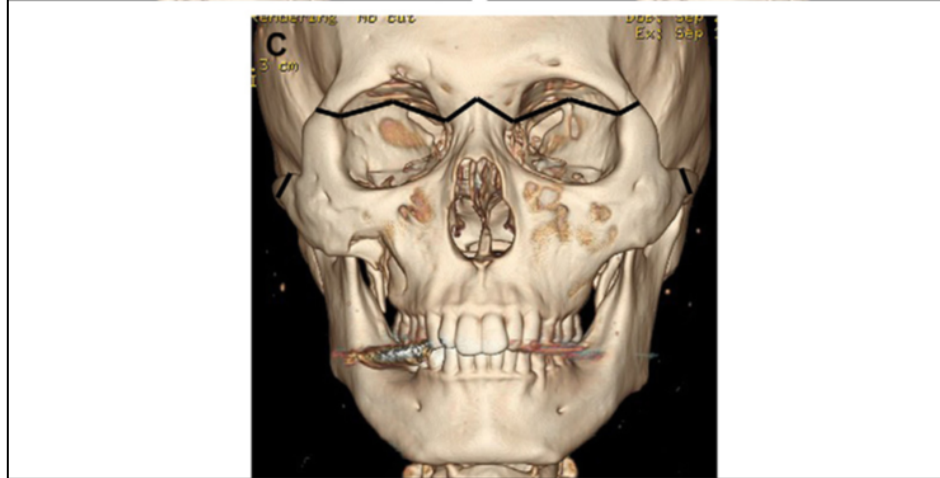
Le Fort I

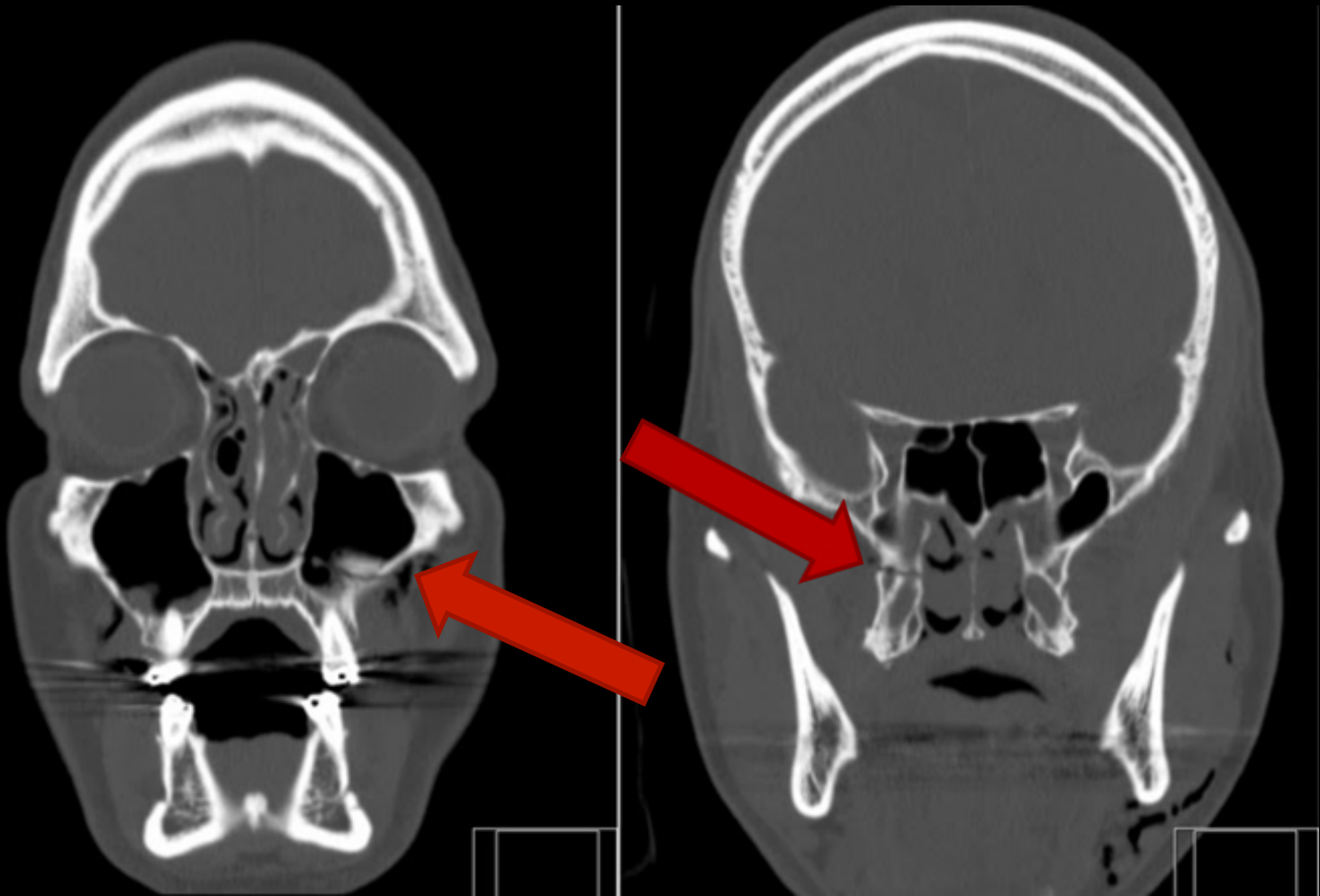


Le Fort II



Le Fort III







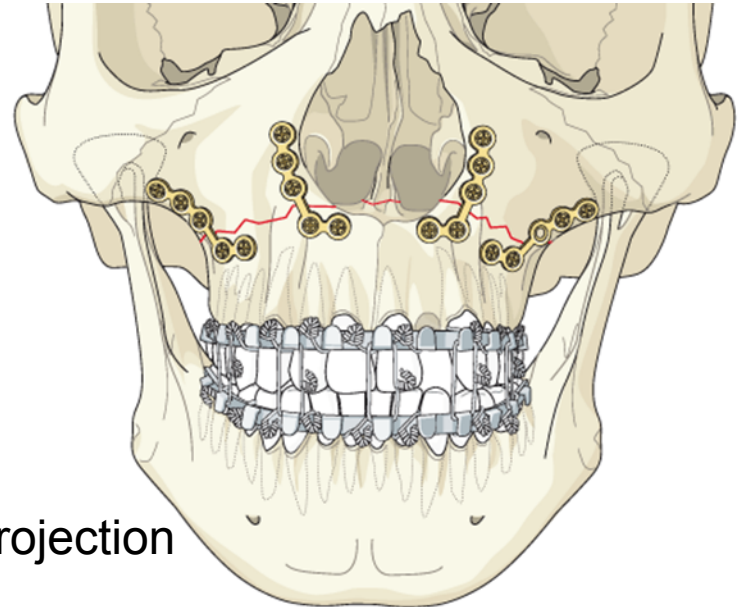
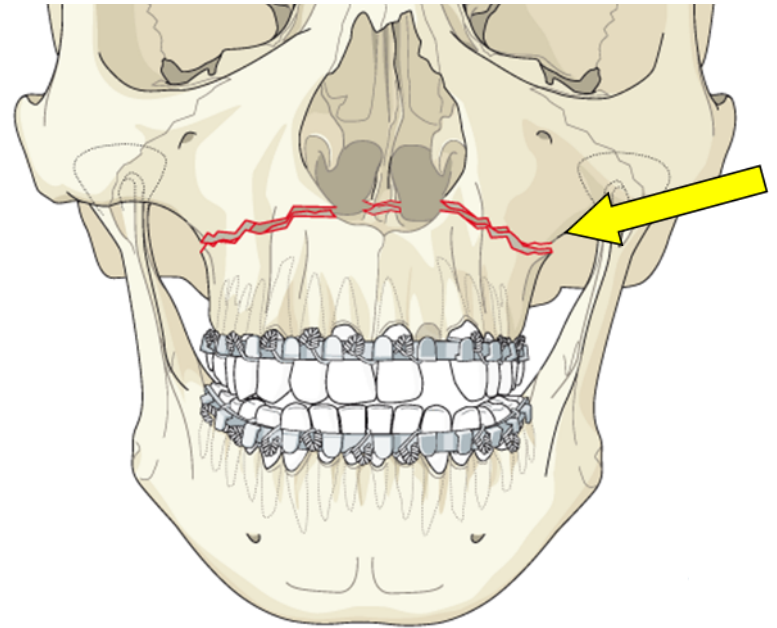
Le Fort I

Observation vs Surgery

Treatment Principles

- MMF
- Exposure
- Reduction
- Fixation

Treatment goals:
restore occlusion, facial height, and facial projection



Le Fort II

Treatment Principles

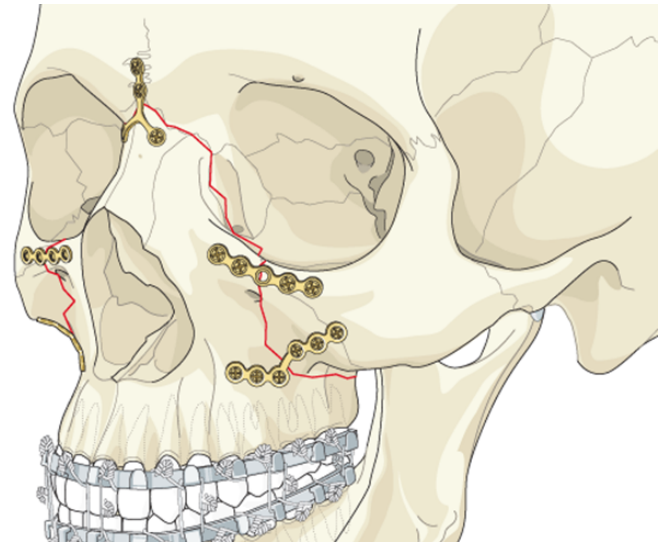
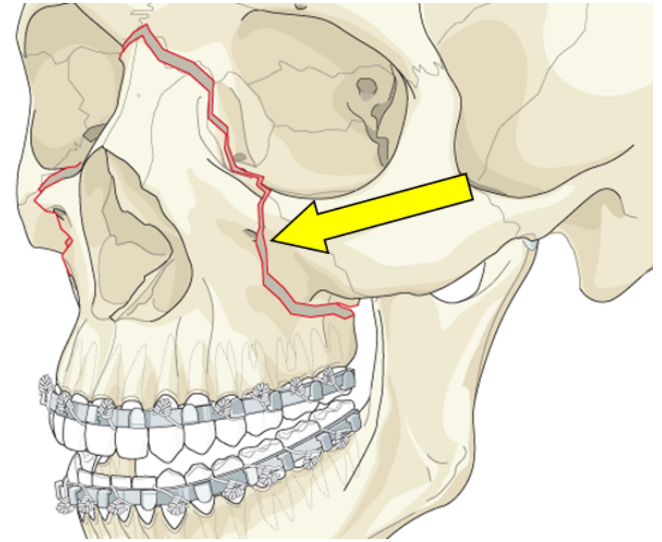
*Orbital involvement

*CSF leak

*Airway

- MMF
- Exposure
- Reduction
- Fixation

Treatment goals:
restore occlusion, facial height, and facial projection



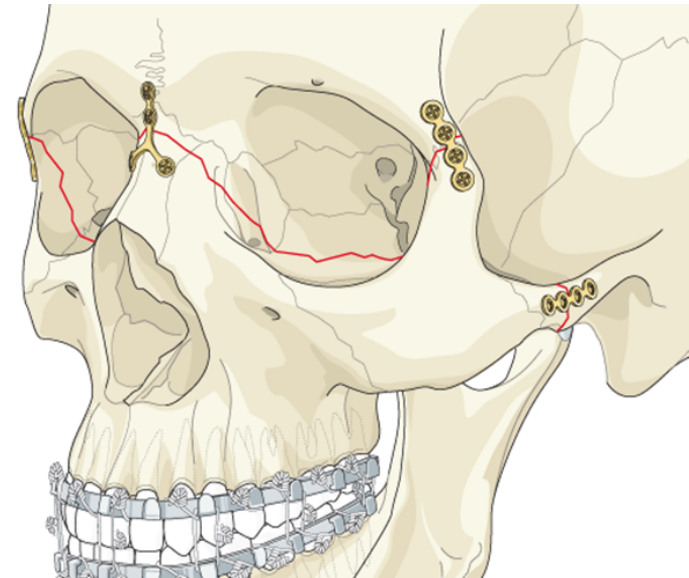
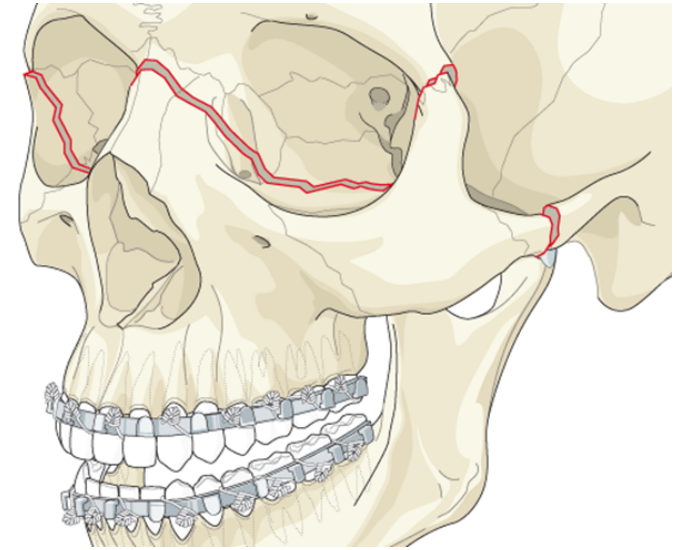
Le Fort III

Treatment Principles

- *ZMC involvement
- *Orbital involvement
- *CSF leak
- *Airway

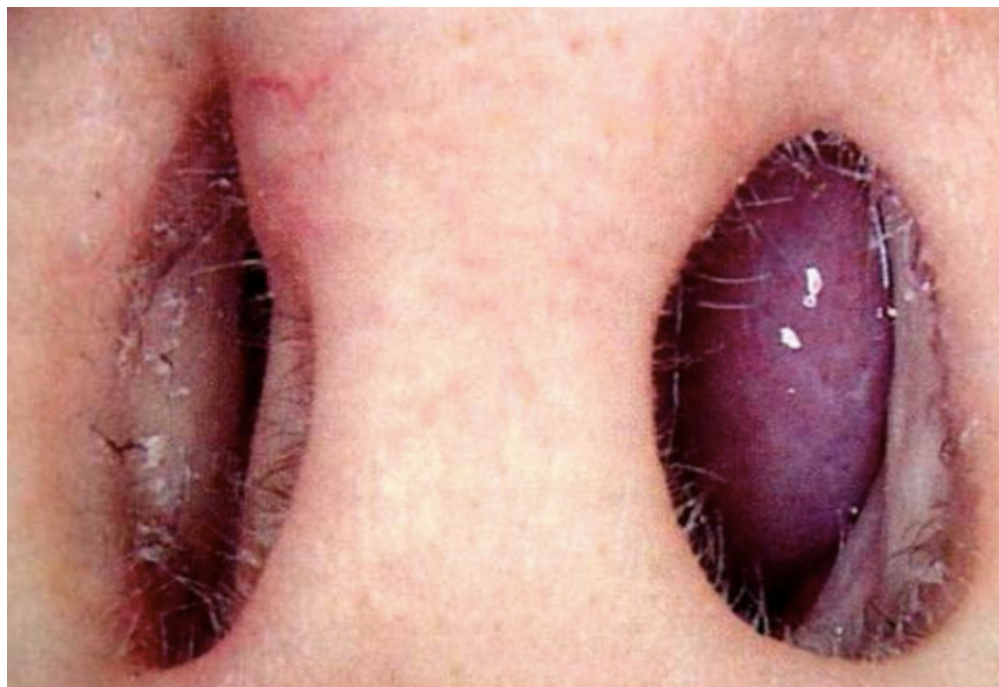
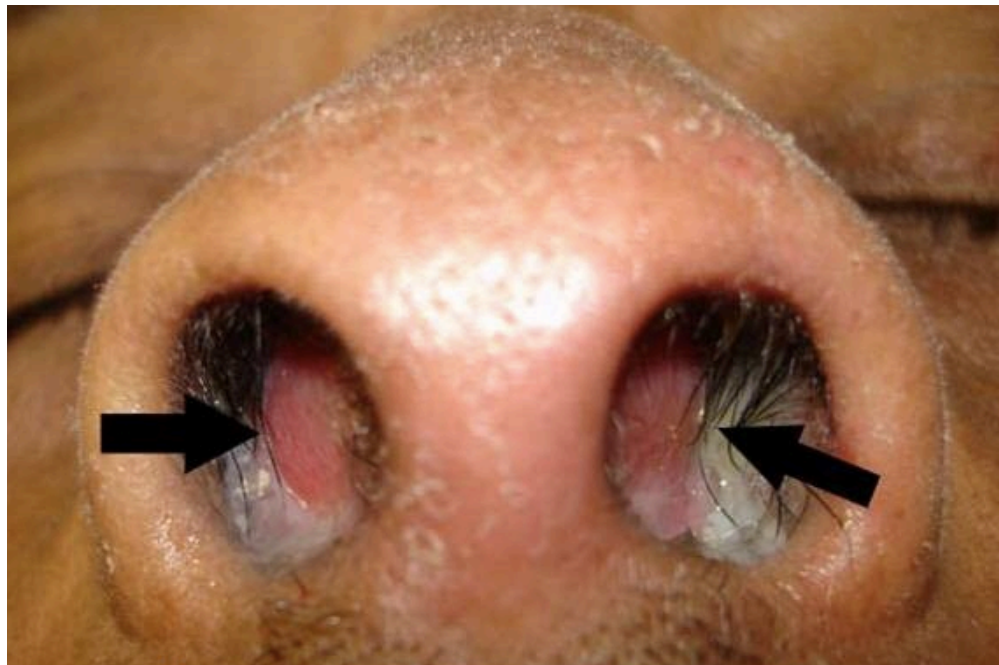
- MMF
- Exposure
- Reduction
- Fixation

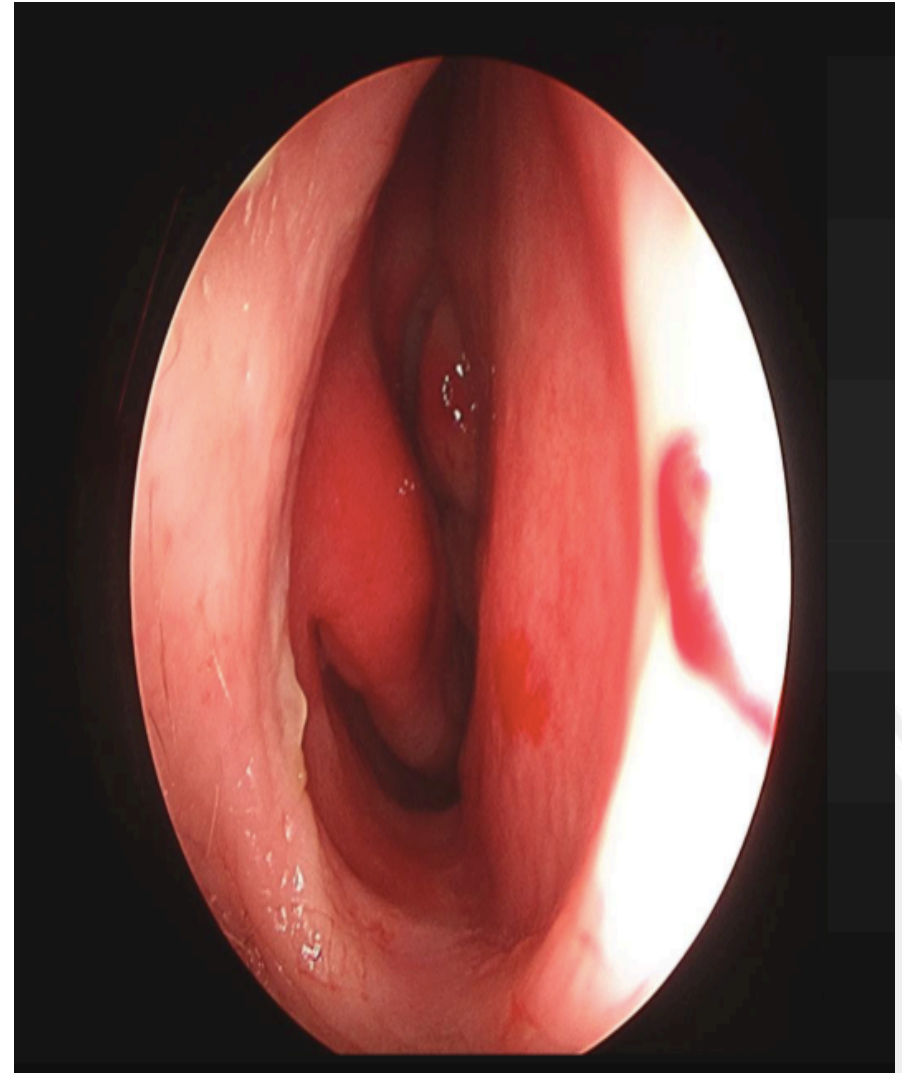
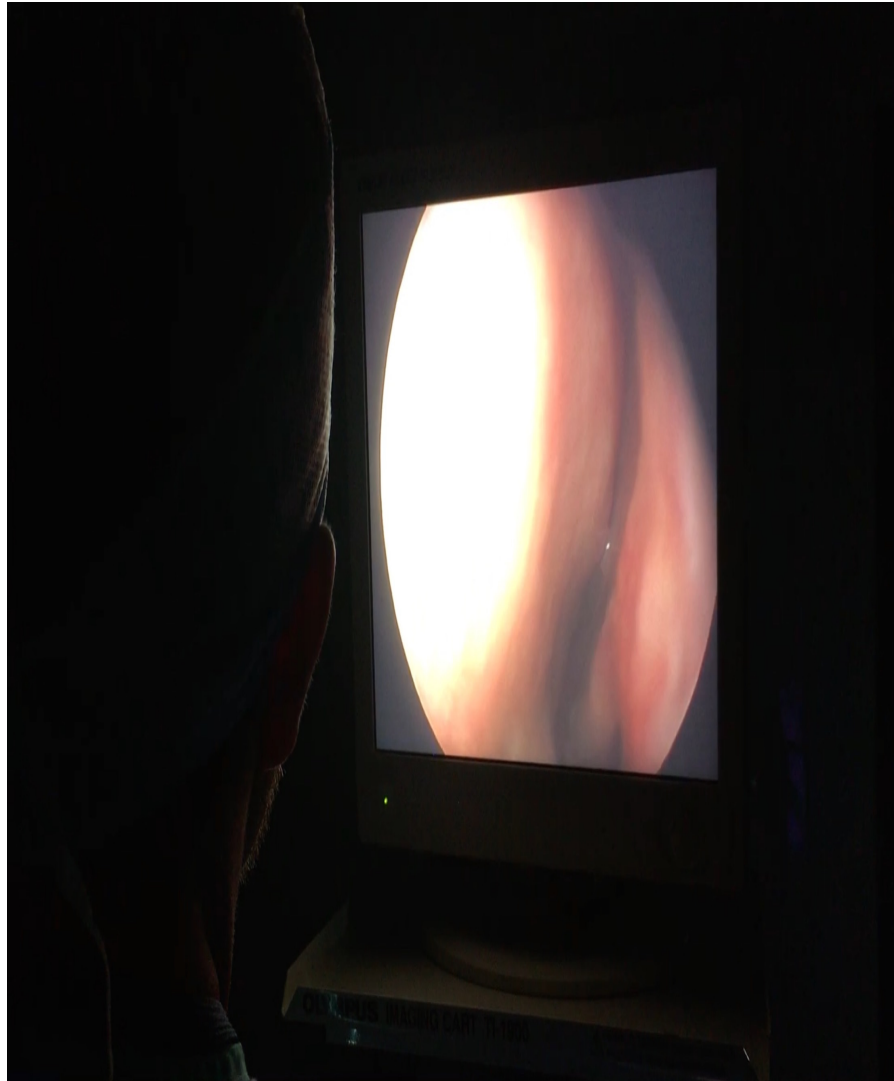
Treatment goals:
restore occlusion, facial height, and facial projection



Nasal and septal fractures







Orbital and zygomatic fractures

Orbital rim is often fractured with zygomaticomaxillary complex (ZMC)

Orbital floor can be fracture in isolation or with ZMC. Often non-operative. Requires close, frequent follow up to observe for sequelae.

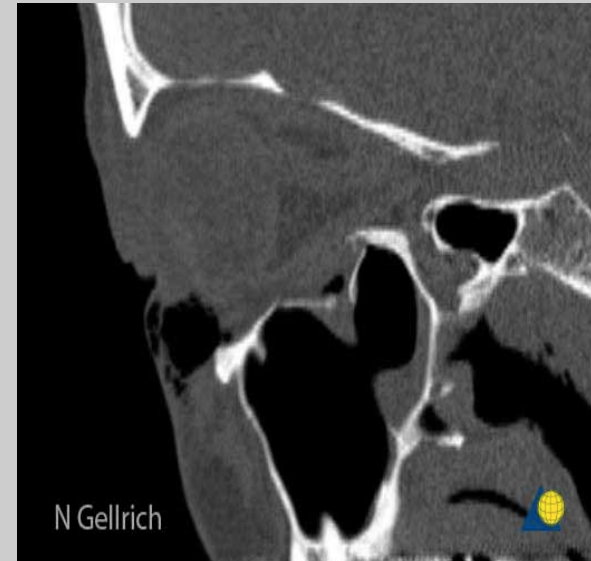
Always get ophthalmology consult

Indications for immediate surgery: entrapment and oculocardiac reflex (bradycardia/heart block from traction on EOM's)

1-2 week window to repair zygoma

3-4 week window to repair orbital floor

LESS IS OFTEN MORE, for orbital fractures.



Management of lower face fractures

Airway assessment and C spine stabilization (ATLS)

Physical exam:

- lower lip sensation
- assess mouth opening
- dentition (occlusion, loose or missing teeth, open fractures)
- upper airway (tongue/palate, nasal cavity patency, trach landmarks)

Imaging

- CT vs panorex

Timing of repair? OK to wait 48-72 hours in many cases

Complications:

- FN injury
- lower lip numbness
- malocclusion
- malunion/nonunion

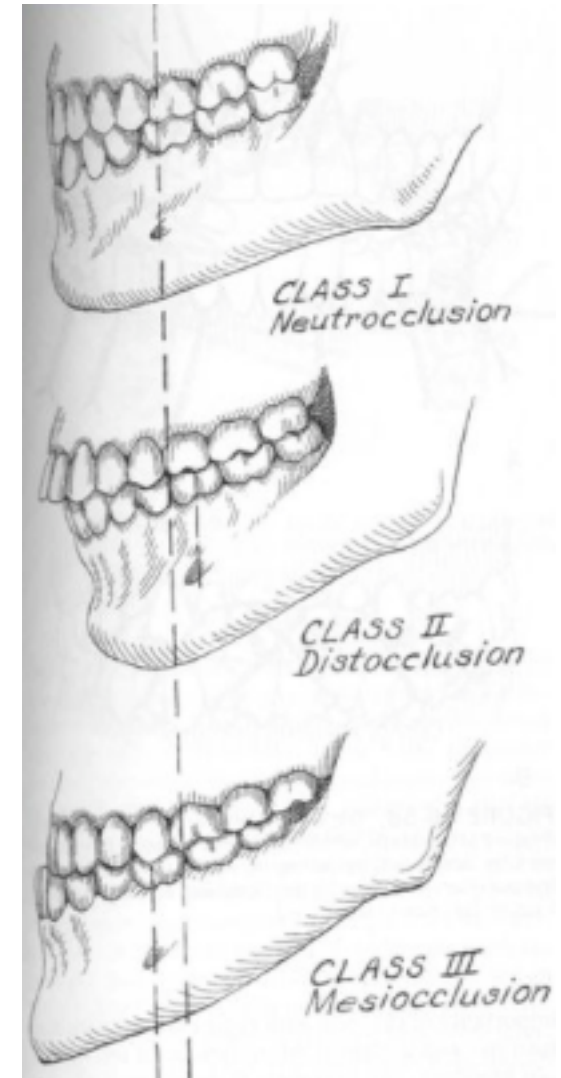
Mandible fractures

OCCLUSION

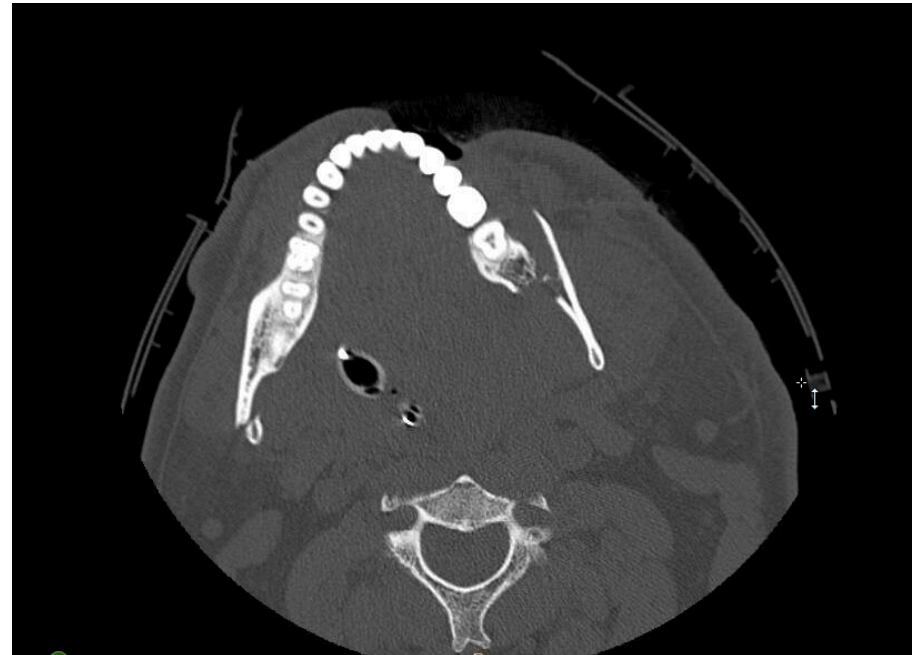
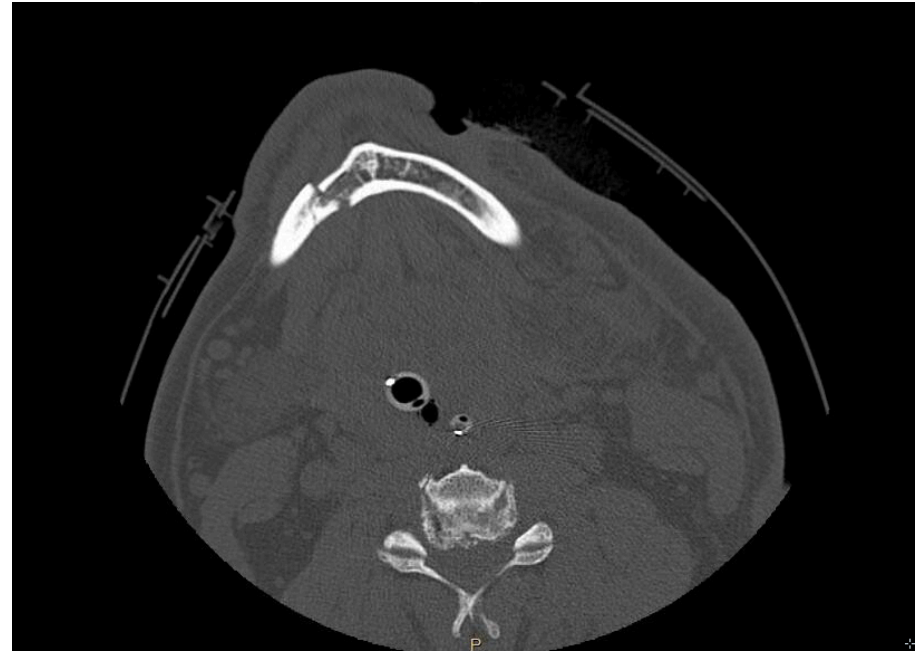
Angle's Class I: mesiobuccal cusp of maxillary first molar rests in the buccal groove of mandibular first molar.

Angle's Class II: mesiobuccal cusp rests anterior to buccal groove

Angle's Class III: mesiobuccal cusp rests posterior to the buccal groove



Patient example



Mandible fractures



Mandible fractures



Mandible fractures





Complications

Ophthalmologic

- White eye fracture / diplopia
- Epiphora
- Enophthalmos—globe malposition
- Change in vision
- Lower lid malposition—ectropion, entropion, lid retraction

Nasal

- Nasal obstruction (septum vs medial buttress)
- Hematoma

Dental

- Trismus
- Malocclusion

Neurologic

- Paresthesia
- Facial nerve dysfunction
- Loss of smell

CSF Leak

Cosmetic change

- Facial asymmetry
- Palpable hardware

Infection

- sinusitis

Beuhler JA, et al. Complications in the treatment of midfacial fractures. Oral Maxillofacial Surg Clin N Am. 2003;15:195–212

Management of soft tissue and bony facial trauma is demanding but rewarding work. Early and accurate diagnosis is critical. Teamwork among multiple surgical specialties is often required in severe, panfacial injuries. Regardless of injury severity, high surgical trauma volume and expertise in aesthetic facial surgery are both important in achieving the best possible long term results.



Thank you.

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