

Nasal-Septal Fractures

Anatomy

Bones -

- Frontal process of maxilla, nasal spine of frontal bone
- Paired nasal bones
- Vomer
- Perpendicular plate of the ethmoid

Anatomy (cont.)

Cartilage-

- Lower lateral cartilage
- Upper lateral (Alar) cartilage
- Septal cartilage
- Sesamoid cartilages

Pathogenesis

Variables-

- The patient's age (tissue flexibility)
- The amount of force applied
- The direction of the force
- The nature of the striking object

Frontal Impact

Plane I-

- Fracture of nasal tip
- Small dorsal hump with supertip depression

Plane II-

- High fracture of nasal bones
- Dorsal depression
- Septal buckling with flattened appearance of the nose

Frontal Impact (cont.)

Plane III-

- Fracture of nasal bones, frontal process and anterior nasal spine
- Comminuted, lateralized
- Marked nasal depression
- Columellar retraction
- Medial canthal relaxation with telecanthus

Lateral Impact

Plane I-

- Unilateral nasal bone depression
- Elevation of contralateral nasal bone
- Septal buckling
- C or S shaped deformity of nasal dorsum

Lateral Impact (cont.)

Plane II/III-

- Fracture extension to frontal process
- Marked displacement of septum and dorsum
- Medial maxillary wall depression

Septal Fracture

- Vertical with anterior fracture
- Horizontal with posterior fracture
- S and C shaped deformities with healing
- Telescoping of segments prevents closed reduction

History

- Force, direction of impact
- Epistaxis
- External deformity
- Prior nasal injury, dysfunction
- Pre-injury photographs

Exam

- Nasal deviation
- Mucosal or skin lacerations
- Ecchymosis, hematoma
- Lid edema, chemosis
- Subconjunctival hemorrhage
- Telecanthus, CSF rhinorrhea

Exam (cont.)

- Topical decongestion
- Debridement of clots
- Internal and external palpation
- Exam of cartilaginous nose
- Roentgenograms
- Photographic documentation

Clinical Decisions

Open versus closed reduction

Closed Reduction-

- Unilateral or bilateral fracture of the nasal bones
- Fracture of the nasal-septal complex with nasal deviation less than one half the width of the nasal bridge.

Clinical Decisions (cont.)

Open Reduction-

- Extensive fracture-dislocation of the nasal bones and septum
- Nasal pyramid deviation exceeding one half the width of the nasal bridge
- Fracture-dislocation of the caudal septum
- Open septal fractures
- Persistent deformity after closed reduction

Clinical Decisions (cont.)

Local versus general anesthesia

Timing of reduction-

- < 3-6 hours- immediate reduction
- < 2-3 weeks- closed reduction
- > 3 weeks- delayed 3-6 months

Anesthesia

- 4% cocaine
- Epinephrine soaked pledgets
- IV or oral sedation
- EMLA cream - time consuming
- General anesthesia

Instruments

- Asch/Walsham forceps
- Large Kelly clamps
- Elevators- Boies/Ballinger
- Various intranasal specula
- Headlight

Reduction

- Elevate fragment with anterolateral force
- Completion of the fracture
- External digital molding
- Reduction of septum is critical
- Asch/Walsham forceps to elevate fracture and reduce septum

Trouble Shooting

- Overriding cartilage fragments
- Post reduction instability
- C-shaped septal fracture
- Converting to an open reduction

Post-Op

- Silastic splints
- Intranasal placement of packing
- External splint application
- Packing out 2-3 days, silastic-10 days
- External splint off when fracture stable

Subacute Open Reduction

- Hemitransfixion, lateral intercartilaginous incisions
- Elevation of dorsal skin and periosteum
- Exposure of cartilage segments
- Reduction of cartilage- scoring, suture
- Maxillary crest involvement- “trapdoor”

Complicated Fractures

- “Open sky” approach
- Use preexisting lacerations when possible
- Depressed comminuted fractures-
wires versus miniplates
- Wound closure
- Prophylactic antibiotics

Delayed Repair

- Complicated due to scarring, fibrosis
- Common problems: Dorsal hump, C/S shaped septum, saddle deformities, septal displacement, fallen or deviated tip
- Common solutions: Excision of hump, cartilage grafting, calvarial grafts, osteotomies

Children

- Physical differences- projection, cartilage: bone, growth centers
- Small fracture--- obstruction with age
- Edema, anxiety tend to obscure fracture
- Operative intervention- cosmesis, obstruction
- Digital compression
- Neonatal fracture-dislocation

Early Complications

- Septal hematoma
- Infections- antibiotic prophylaxis
- Epistaxis- cautery, packing, ligation
- CSF Rhinorrhea
- Emphysema of the face, neck

Late Complications

- Organization of hematomas- airway obstruction
- Synechia- divide if symptomatic
- Obstruction of the nasal vestibule
- Residual osteitis
- Malunion
- Naso-facial disproportion