KEEP YOUR EDGE 2015
Hockey Sports Medicine

Toronto Marriott Downtown, Eaton Center Hotel
Grand Ballroom Foyer
Toronto, ON Canada
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* Nothing to Disclose
Oral And Maxillofacial Injuries In Athletes
Primary Survey

- Mechanism of Injury!!!
- Collateral damage: Closed head injury, C-Spine
- Airway compromise must be identified
- Bilateral anterior mandibular fractures can collapse the tongue into the airway- jaw thrust, chin lift; no head tilt until c-spine clear
- Hemorrhage control: direct pressure by whatever method
- Triage: Maybe to the bench, generally to the medical room; exception: when its time to ‘scoop and run’!!
Think Airway and C-Spine!
Thorough Clinical Evaluation

- Inspect the face for symmetry, swelling, ecchymosis, mobility: bimanual palpation
- Orderly exam: top to bottom, inside out
- Orbits, Zygomas, Nose, Maxilla and Mandible; Intra-oral exam
- Things that move should move: eyes, tongue, TMJ; things that don’t move shouldn’t: bones, teeth
- Look for fractures especially with higher pain report: crepitus, mobility, step discrepancy are good indicators
- Raccoon eyes (periorbital ecchymosis): Middle or upper face fracture; Battle’s sign (mastoid ecchymosis): Basilar skull fracture: Subconjunctival hemorrhage: Zygomatic or orbital fracture; Bruits, thrills
Battle’s Sign: Fracture Of Skull Base
Intra-Oral Exam

- Look for open wounds, foreign bodies, and loose teeth or bony segments
- Evaluate the occlusion- ‘How does your bite feel?’
- Be wary of occult injuries that may lead to airway compromise: sublingual hematoma
- Appropriate x-rays if you suspect aspiration or ingestion of tooth, dental appliance or foreign body.
Two Avulsed Teeth, One Intruded Tooth
Aspirated Tooth
Ingested Dental Bridge
Open Wounds

- Initial management: hemostasis, hemostatics (surgicel), glue (Derma-Bond), steri-strips with skin adhesive, or quick transitional repair with ‘temporary sutures’

- Definitive Repair: Derma-Bond, Steri-strips with adhesive (mastisol), Sutures: sterile prep and local anesthesia as needed

- Extra-Oral: Superficial laceration: one layer non-resorbables (5-0 nylon); Deep laceration: layered closure with resorbables for deep layers (4-0 vicryl, vicryl rapide or chromic gut); non-resorbables for skin (5-0 nylon)

- Heavy suture for scalp (2-0 or 3-0 silk or nylon), finer for eyelids (6-0 nylon)

- Antibiotics: extensive or highly contaminated wounds, or near eyes: Keflex, or clindamycin if allergic

- Local anesthesia: 2% lidocaine with 1:100,000 epinephrine or 0.5% marcaine with 1:200,000 epinephrine given in infiltration or nerve blocks
Open Wounds

- Intra-oral: resorbables preferred but think stronger, longer lasting sutures in athletes: vicryl or vicryl rapide; can use non-resorbables in certain situations like tongue lacerations (3-0 or 4-0 silk)

- May need layered closures for extensive lacerations; tongue lacerations: vicryl for deep muscle, silk for surfaces (close both sides for self inflicted tongue bite); silk absorbs water, stays soft and lies flat for comfort

- Through-Through skin into oral cavity: 3-4 layer closure: close inside water-tight first, re-prep skin and work out; antibiotics (penicillin or amoxicillin; clindamycin if allergic)

- Always think about collateral injuries: nerves, salivary ducts or tear ducts

- Bolster dressing with suture-fixed cotton rolls impregnated with antibiotic ointment on either side of auricular lacerations to prevent hematomas and ‘cauliflower ear’

- Return to play dependent upon severity of wound: Immediate return vs 2-3 weeks
Imaging

- Mandible series: AP or PA mandible, Lateral oblique views, Townes view (condyles)
- Skull series: AP and PA, Waters view, submental-vertex or jug handle view (zygomatic arches), lateral skull (nasal bones)
- Orbital views
- These can often be done on site
- If indicated, definitive imaging with (usually) CT scan or MRI
Nasal Fracture

- Most frequent facial fracture
- External deformity, crepitus, airway compromise, pain and hemorrhage
- Stop hemorrhage: ice, vaso-constricting sprays or drops, packing
- Definitive repair when necessary and practical
- Simple closed reductions have been done on site
- Multiple unrepaired fractures are difficult to fix, and cause airway compromise
Displaced Nasal Fracture With Peri-Orbital Ecchymosis
Nasal Packing

- Dental roll
- Rhino rocket or Nasal Doyle or Mericel (absorbent expanding nasal tampons)
- Inflatable balloons for severe bleeds (especially posterior)
- Septal hematomas must be drained to prevent perforations
Treatment Nasal Fracture

- CT scan
- Closed reduction of bones, closed reduction of septal fracture if present
- Intra-nasal packing for 3 days, Denver splint externally for one week
- Open reduction with plates if severe fracture
- Return to play 4-6 weeks, 2-4 weeks with full face protection
Alveolar Process Fractures

- Fractures of the tooth bearing portion of the upper and lower jaws
- Fracture segments may include multiple teeth
- Soft tissue injury is common
- Malocclusion is a common complaint so injury must be differentiated from jaw fracture
- Segments may vary from minimally mobile and displaced, to grossly mobile and markedly displaced, to totally nonviable
Alveolar Process Fractures

- Minimally displace segment with normal occlusion can be managed with antibiotics and soft diet
- More mobile or displaced fractures must be repositioned and splinted
- Repositioning can usually be done with digital manipulation under local anesthesia
- Splinting is done with light cured acrylic with or without fine wire or heavy fishing line; severely displaced or larger segments are splinted with arch bars and wires; jaw wiring may be required in the most extensive cases
- Nonviable segments may need to be debrided, but segments are usually splinted even if teeth are unsalvageable to try to preserve bone
Acute Treatment of Alveolar Fractures

- Hemostasis, analgesics, local anesthesia
- Reposition segment if possible
- Soft tissue repair
- Check clinically for jaw fracture
- Plain radiographs if available
Definitive Treatment of Alveolar Fractures

- Dental radiographs: Panorex, dental periapical films
- Reposition and splint segment in proper anatomic and occlusal relationship
- Splint generally 2-4 weeks
- Root canal evaluation and treatment as is needed
- Bone grafting to reconstruct non-viable segments
- Return to play as is practical and comfortable, with mouthguard and additional facial protection
Mandibular Fractures

- Second most common facial fracture
- ‘See one fracture, look for two’
- Can be associated with closed head injury because of temporomandibular joint
- Can cause airway compromise
- Often occurs through impacted third molar site
- Fracture sites: condylar, body/angle, symphysis, parasymphysis, coronoid (rare)
Condylar Fracture

- Most common; can be unilateral or bilateral
- Swelling pain crepitus, limited opening
- Malocclusion with prematurity usually on fractured side and anterior open bite
- Deviation of jaw on opening toward fracture
- May be open fracture with laceration of ear canal
Left Chin Trauma: Right Subcondylar Fracture
Body and Angle Fractures

- Movement and crepitus at site
- Malocclusion, bleeding
- Swelling and hematomas: intra and extra-oral
- Pain and limited opening
- Often through impacted third molars (a good reason for their prophylactic removal in athletes)
Symphysis or Parasymphysis Fractures

- More easily missed on x-rays
- Often associated with condylar fracture
- Sublingual hematoma!!
- Avulsion of anterior teeth- chest x-ray if suspect aspiration
- Often a step deformity in teeth on either side of the fracture
- Bimanual palpation!!
Displaced Mandible Fracture
Acute Treatment

- Hemostasis
- Ice, analgesics, local anesthesia
- Plain films (mandibular series) if available; panorex ASAP
- Immobilization with Barton Bandage (ace wrap)
- Lasso ligature with 24 or 26 gauge wire or dental floss around stable teeth on either side of a fracture will decrease pain and bleeding, and temporarily immobilize the fracture
Lasso Ligature
Definitive Treatment of Jaw Fractures

- CRMMF, ORIF

- CRMMF: Arch bars, wires; slower return to play, liquid diet, fixation for 4-6 weeks (less with some condylar fractures); aerobic exercise fine, light weights possible

- ORIF: Plate and screw fixation! Less MMF time required, earlier return to solid food and play (with full face protection)
Maxillary Fractures

- Significant injury force injury
- Malocclusion, swelling and pain
- Mid-face instability: stabilize athlete’s head at forehead or nose, grab the upper front teeth, and look for upper jaw mobility
- Bleeding, epistaxis
- Mid-face elongation/shortening, or flattening
- V2 paresthesia, concurrent injury
Principles of Treatment

- Re-establishment of proper occlusion is paramount
- Anatomic reduction is secondary
- Immobilize until bony union can occur
- Earlier mobilization with elastic traction for condylar fractures
- CRMMF (jaw wiring), ORIF (jaw wiring +plates and screws)
- Out 2-6 weeks; return with facial protection for 2-4 additional weeks
Zygoma Fractures

- Fighting, object strike, or collision: requires significant force
- Subconjunctival hemorrhage, paresthesia infra-orbital nerve, step discrepancy orbital rim or zygomatic arch
- Depressed, indented cheek bone (compare both sides)
- Can have altered bite
- Trismus and decreased extra-ocular motion (especially upward gaze)
- Plain films: Waters and Submental-Vertex views on site if available
Depressed Zygoma Fracture
Sub-conjunctival Hemorrhage
Treatment Zygoma Fractures

- CT scan recommended
- Eye exam by Ophthalmologist before repair
- ORIF with 2 or 3 point stabilization; plates at Frontal-zygomatic suture, inferior orbital rim and possibly intra-oral buttress
- Orbital floor implant for blow-out fracture if needed
- Return to play 4-6 weeks, 2-4 weeks with supplemental full face protection if possible
Orbital Fractures

- Blow out fracture most common
- Usually orbital floor or medial wall involved
- Repair needed for functional or esthetic compromise
- Often accompany zygoma fractures
- Orbital rim fractures occur with more severe forces and often accompany other facial bone fractures as well
- Repair generally is required
- Eye exam!!! Retinal injuries, globe trauma, hyphema
Orbital Signs

- Enophthalmos
- Vertical and horizontal displacements: superior (hematoma); inferior (blow out fracture); horizontal (NOE fractures)
- Diplopia, visual change
- Decreased extra-ocular motion
- Subconjunctival hemorrhage
Peri-Orbital Ecchymosis and Telecanthus: Nasal-Orbital-Ethmoidal Fracture
Treatment Orbital Fractures

- CT scan
- Eye exam by ophthalmologist before repair
- ORIF
- Orbital floor implant if needed
- Return to play 4-6 weeks, 2-4 weeks with full face protection and normal eye exam
Obstructive Sleep Apnea

- 12 million people in US
- 1 in 25 men, 1 in 50 women; more than half are overweight
- Snoring, poor sleep, daytime somnolence, accessory muscle breathing, apneic events
- Apneic events can lead to reduced flow of blood to vital organs and cause irregular heart rhythms
- Diagnosis: physical exam, plain x-rays, 3D airway imaging
- Definitive diagnosis: **Sleep Study**
Treatment Of OSA

- Mild: Weight loss, sleep position improvement with pillows or bed, avoid alcohol or sleeping pills, nasal sprays or strips, mandibular repositioning appliances

- Mild to moderate: Appliances, CPAP, minor surgeries (ie., septoplasty, palatoplasty, tonsils and adenoids, chin advancement)

- Severe: CPAP, minor surgeries, major surgery (Maxillo-Mandibular Advancement or MMA)

- Mike Napoli
Maxillo-Mandibular Advancement

- 54 yo dentist from Louisville
- Snorer, fragmented sleep, daytime somnolence
- 6’3”, 203, otherwise healthy
- Positive sleep study, decreased airway on plain film, positive 3D volumetric airway study
Questions?
Thank You!