Head & Neck Trauma

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Mechanisms of Trauma

- MVA
- Iatrogenic
- Burns and frostbite
- Noise
- Barotrauma
- Lightning
الإحصاءات الصادرة عن وزارة الصحة

عام 2004 - 2005

- 896 قضية عرضت على اللجان الطبية الشرعية
- صدرت قرارات إدانة في 428 قضية منها
- إدانة 299 طبيباً من اصل 848 طبيباً مدعى عليهم
- ما يعادل 35 في المائة من عدد القضايا المنظورة

الشرق الأوسط الأول 19 accounted 1427 هـ 13 أغسطس 2006 العدد 10120
Auricle injuries

- Hematomas
  - separate the perichondrium (blood supply) from the cartilage
  - excise fibrous tissue
- Apply pressure dressing, drain

- Avulsion:
  - Reimplantation
  - Microvascular anastomosis
Cauliflower Ear
Complications of Ear-Piercing
Case

LEFT EAR (AS)

NR IPSI & CONTRA
Hemotympanum
Longitudinal TB#
Complications of TB#

- Hearing loss
- Vertigo
- Tinnitus
- Facial paralysis
- CSF leak
- Carotid injury
Naso-orbital Ethmoid and Frontal Sinus Fractures
Naso-orbital Ethmoid Fractures

Failure of Diagnosis
Leads to Significant
Facial Deformities
Septal hematoma
Nasal Fracture with Septal Hematoma
Complication

Nasal Deformity
  – Flattened Nasal Dorsum
  – Septal Deviation / Dislocation

Intracranial Involvement
  – Cerebrospinal Fistula
  – Pneumocephalus
Goals of Management

- ABCD
- Soft Tissue Repair
- Framework Reconstitution
  - Nasas Region
  - Orbital
  - Nasal Support
  - Sinus
Anatomy/Zone I

- Cricoid → sternum and clavicles
- Contains the
  - Subclavian arteries and veins
  - Dome of the pleura
  - Esophagus
  - Great vessels of the neck + recurrent nerve
  - Trachea
- S/S may be hidden from inspection in the mediastinum or chest
Anatomy/Zone II

- Cricoid ➔ Angle of the mandible
- Contains the
  - Larynx
  - Pharynx
  - Carotid artery and jugular vein
  - Phrenic, vagus, and hypoglossal nerves
- Injuries here are seldom occult
- Common site of carotid injury
Anatomy/Zone III

• Lies above the angle of the mandible
• Contains the
  – Internal and external carotid arteries
  – Vertebral artery
  – Several cranial nerves
• Vascular and cranial nerve injuries common
History

- Obtain from witnesses, patient
- Mechanisms of injury - stab wounds, gunshot wound, high-energy, low-energy
- Estimate of blood loss at scene
- Any associated thoracic, abdominal, extremity injuries
- Neurologic history
Physical Examination

- Thorough head and neck exam
- Palpation and stethoscope (thrills and bruits)
- Neuro exam: mental status, cranial nerves, and spinal column
- Examine the chest, abdomen, and extremities
- Be sure to examine the back of the patient as
- Don’t blindly explore wound or clamp vessel
Radiographs

- CXR - inspiratory/expiratory /Lateral
- Cervical spine film to rule out fractures
- Soft tissue neck films AP and Lateral
- CT Scan
- Arteriograms, contrast studies as indicated
Refactory shock or evolving stroke

Patient with symptoms

Zone I
- ANGIOGRAPHY
- NECK EXPLORATION

Zone II
- ANGIOGRAPHY
- INTERVENTIONAL RADIOLOGY

Zone III
- ANGIOGRAPHY

Asymptomatic patient

Zone I
- ANGIOGRAPHY
- ESOPHAGOSCOPY
- LARYNGOSCOPY
- NECK EXPLORATION
- OBSERVATION

Zone II
- DIRECTED EXAM**
- NECK EXPLORATION
- OBSERVATION

Zone III
- ANGIOGRAPHY
- NECK EXPLORATION
- OBSERVATION

**DIRECTED EXAM: Angiography, esophagoscopy, and/or laryngoscopy based on path of projectile and clinical exam
Impending Respiratory Failure

- Reduced air entry
- Severe work
- Cyanosis despite $O_2$
- Irregular breathing / apnea
- Altered Consciousness
- Diaphoresis
Intubation: Indications

- Failure to oxygenate
- Failure to remove CO\textsubscript{2}
- Increased WOB
- Neuromuscular weakness
- CNS failure
- Cardiovascular failure
Laryngeal Trauma
Introduction

- Functions
  - Airway
  - Voice
  - Swallowing
- Well protected (mandible, sternum)
- Support: Hyoid, thyroid, cricoid
- Outcome determined by initial management
Mechanism of Injury

- **Blunt**
  - MVA, strangulation, clothesline, sports related
  - Significant internal damage, minimal signs

- **Penetrating**
  - GSW: damage related to velocity
  - Knife: easy to underestimate damage
Initial Evaluation

• ATLS principles ABCD
• Secure airway – local tracheotomy
• Intubation can worsen airway
• Avoid cricothyroidotomoy
• Pediatric: tracheotomy over bronchoscope
• Clear C-spine
History

- Change in voice – most reliable
- Dysphagia
- Odynophagia
- Difficulty breathing - more severe injury
- Anterior neck pain
- Hemoptysis
Signs of Respiratory Distress

- Tachypnea
- Tachycardia
- Grunting
- Stridor
- Head bobbing
- Flaring
- Inability to lie down
- Agitation
- Retractions
- Access muscles
- Wheezing
- Sweating
- Prolonged expiration
- Pulsus paradoxus
- Apnea
- Cyanosis
Physical exam

- Stridor
- Hoarseness
- Subcutaneous emphysema
- Laryngeal tenderness, ecchymosis, edema
- Loss of thyroid cartilage prominence
- Associated injuries - vascular, cervical spine, esophageal
Physical Exam
Flexible Fiberoptic Laryngoscopy

• Perform in emergency room
• Findings dictate next step
  – CT scan
  – Tracheotomy
  – Endoscopic
  – Surgical Exploration
  – Other studies
Laryngoscopic Exam
Figure 4: Corresponding photos and endoscopic views show the WuScope in use; the suction catheter entering the glottis first, then followed by the ETT.
Radiographic Imaging

• C-spine
• CXR
• CT
• Angiography
• Contrast esophagrams
CT Scan
CT Scan
Laryngeal Trauma

Asymptomatic or minimal symptoms

F/L

CT scan

Mild Edema
Small hematoma
Non-displaced linear fracture
Intact mucosa
Small lacerations

Bed rest
Cool mist
Antibiotics
Steroids
Anti-reflux

Displaced fracture
(by CT or exam)
Loss of mucosa or extensive laceration
Bleeding
Exposed cartilage

Tracheotomy
Panendoscopy
Explore
Laryngeal Trauma
Respiratory distress, open wounds, bleeding

Tracheotomy

Panendoscopy

Explore
Laryngeal Framework Repair
Laryngeal Framework Repair
Treatment Goals

- Preservation of airway
- Prevention of aspiration
- Restoration of normal voice
NI-SNHL

- 30 Y saudi solder
- Lt ear tinnitus
- Can not sleep
- Severe depresion
Trauma & SNHL

- NISNHL
- Acoustic trauma
- Barotrauma
Noise induce SNHL

- Boilermaker's deafness
- one of the most common occupationally induced disabilities
- (OSHA) Occupational Health and Safety Administration
- Tinnitus
  - commonly accompanied NISNHL
  - warning sign
**Noise induce SNHL**

- Usually is limited to 3, 4, and 6 kHz
- 4 kHz Greatest loss?
- ?Susceptibility
  - Age, gender, race, and coexisting vascular disease Not been shown to correlate with susceptibility to NIHL
  - No known way to predict susceptibility
**TTS vs PTS**

- **Temporary threshold shift (TTS)**
  HL recovers over the next 24 to 48 hours

- **Permanent threshold shift (PTS)**
98

- 90 db for 8 hours
- 95 db for 4 hours
- 100 db for 2 hours
- 105 db for 1 hours
<table>
<thead>
<tr>
<th>Noise Source</th>
<th>dB</th>
</tr>
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<tbody>
<tr>
<td>Rocket launching pad</td>
<td>180</td>
</tr>
<tr>
<td>Jet plane</td>
<td>140</td>
</tr>
<tr>
<td>Gunshot blast</td>
<td>140</td>
</tr>
<tr>
<td>Automobile horn</td>
<td>120</td>
</tr>
<tr>
<td>Pneumatic drill</td>
<td>100</td>
</tr>
<tr>
<td>Subway</td>
<td>90</td>
</tr>
<tr>
<td>Average factory</td>
<td>85</td>
</tr>
<tr>
<td>Noisy restaurant</td>
<td>80</td>
</tr>
<tr>
<td>Busy traffic</td>
<td>75</td>
</tr>
<tr>
<td>Conversational speech</td>
<td>66</td>
</tr>
<tr>
<td>Average home</td>
<td>50</td>
</tr>
<tr>
<td>Quiet office</td>
<td>40</td>
</tr>
<tr>
<td>Soft whisper</td>
<td>30</td>
</tr>
</tbody>
</table>
Primary role of otolaryngologists

• Prevention
• Early identification.
Barotrauma

- Injury of the TM and middle ear
- Unequalized pressure differentials between the middle and external ears
- Flying or underwater diving
- ETD may predispose
S/S

- Pain
- H.L
- hyperemia and possible TM perforation
- Edema and ecchymosis of the ME mucosa
- Conductive hearing loss
- Hemotympanum
- Transudative middle ear effusion
Foreign Bodies of the Aerodigestive Tract

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Foreign Bodies

- Foreign body ingestion
- Foreign body aspiration
- Toddlers
  - Oral exploration
  - Easy distractibility
  - Cognitive development
Foreign Body Ingestion

- Coins
- Meat
- Vegetable matter
- Less than 24 hours in most
Foreign Body Aspiration

• Parental suspicion
• History
  • Choking
  • Gagging
  • Wheezing
  • Hoarseness
  • Dysphonia
• Can mimic asthma, croup, pneumonia
• “A positive history must never be ignored, while a negative history may be misleading”
Foreign Body Aspiration

• Physical exam
  – Larynx/cervical trachea
    • Inspiratory or biphasic stridor
  – Intrathoracic trachea
    • Prolonged expiratory wheeze
  – Bronchi
    • Unequal breath sounds
    • Diagnostic triad - <50%
      – Unilateral wheeze
      – Cough
      – Ipsilaterally diminished breath sounds

• Fiberoptic laryngoscopy
Flexible Laryngoscopy

- Proper Equipment
- Assess nares/choanae
- Assess adenoid and lingual tonsil
- Assess TVC mobility
- Assess laryngeal structures
Radiology

- Plain films:
  - Chest and airway AP and lat
  - Expiratory films
- Fluoroscopy
- Barium Swallow
- CT, MRI, Angiography
Direct Laryngoscopy

- Insufflation technique:
• 5y
• Unilateral discharge
• Foul smell
Foreign Body Ingestion

- Disc batteries
  - Emergency (Alkaline? Acid)
  - NaOH, KOH, mercury
    - 1 hour – mucosal damage
    - 2 to 4 hours – muscular layers
    - 8 to 12 hours – perforation
  - Esophagoscopy
  - Observation for gastric location for 4-7 days
  - Laparotomy for bowel perforation
Foreign Body Ingestion

• Common locations
  – Cricopharyngeus
  – Aorta/left mainstem bronchus
  – Gastroesophageal junction
Foreign Body Ingestion

- Radiopaque
  - Coins
  - Cartilage/bones
- Radiolucent
  - Hot dogs
- Barium swallow
Foreign Body Ingestion

- Barium Swallow
**Foreign Body Ingestion**

- **Removal**
  - General anesthesia
  - Intubated
  - Esophagoscopy
  - Examine for ulceration/perforation
Foreign Body Ingestion

• Postoperative management
• NPO for 4-12 hours
• Perforation
  – Tachycardia
  – Tachypnea
  – Fever
  – Chest pain
Foreign Body Aspiration

• Radiography
  – PA & lateral views of chest & neck
  – Inspiration & expiration
  – Lateral decubitus views
  – Airway fluoroscopy

• 25% have normal radiography
Foreign Body Aspiration
Foreign Body Aspiration
Foreign Body Aspiration
Foreign Body Aspiration
Foreign Body Aspiration
Foreign Body Aspiration

• Postoperative Care
  – Chest physiotherapy for retained secretions
  – Antibiotics
    • Not routinely used
  – Steroids
    • Not routinely used
    • Traumatic insertion or removal
Foreign Body Aspiration

- Complications
  - Pneumonia
    - Antibiotics, physiotherapy
  - Atelectasis
    - Expectant management, physiotherapy
  - Pneumothorax
  - Pneumomediastinum
Examine both ears
What do you think?

- 3 y old
- Lt side discharge
- Foul smell
Thank You