



- FACIAL HARD AND SOFT TISSUE INJURIES
- PENETRATING NECK INJURY PATHWAY
- MAXILLOFACIAL INJURY PATHWAYS

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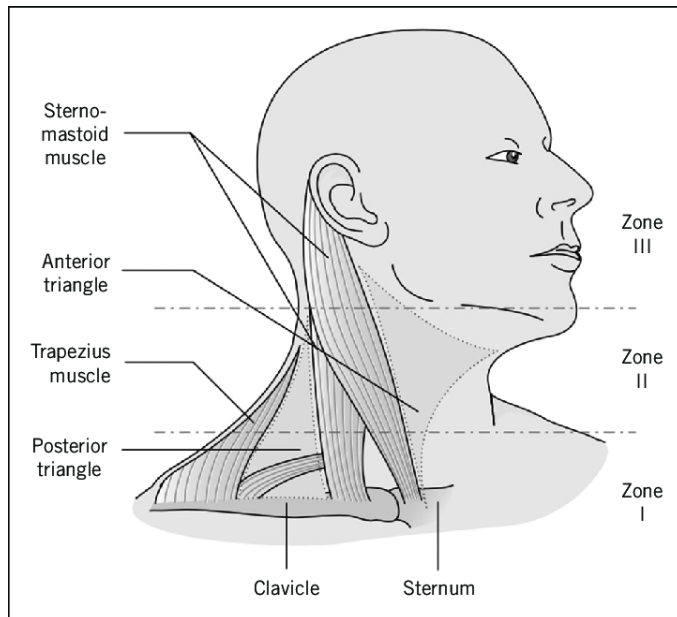
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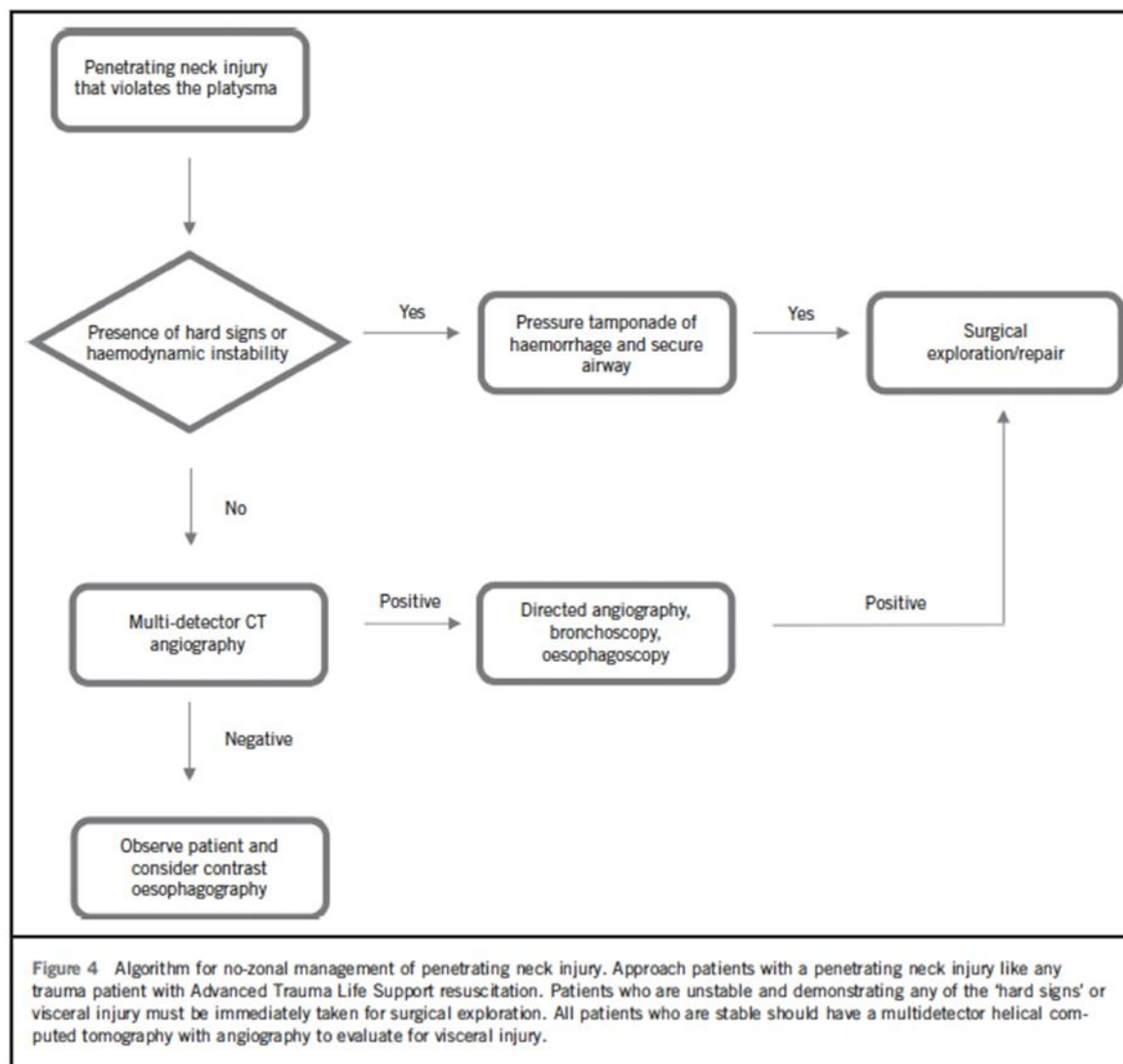
Penetrating Neck Injury (PNI) Pathway

- Identification of correct level of injury will lead to correct investigation of underlying injuries
- Follow ATLS management, with **Vascular** input to rule out/rule in need for immediate surgery +/- **ENT/Maxillofacial** input
- Management will differ mainly based on the presence or absence of a great vessel injury (see below)
- 35% of injuries will cross zones
 - Level 1- Clavicle to Cricoid
 - Level 2- Cricoid to Angle of Mandible (77%)
 - Level 3- Above Angle of Mandible



Box 1 'Hard signs' indicating immediate explorative surgery in penetrating neck injury.

- > Shock
- > Pulsatile bleeding or expanding haematoma
- > Audible bruit or palpable thrill
- > Airway compromise
- > Wound bubbling
- > Subcutaneous emphysema
- > Stridor
- > Hoarseness
- > Difficulty or pain when swallowing secretions
- > Neurological deficits
- > Haematemesis





Surgical Management (Indication- unstable patient with haemodynamic compromise)

Pre-Hospital:

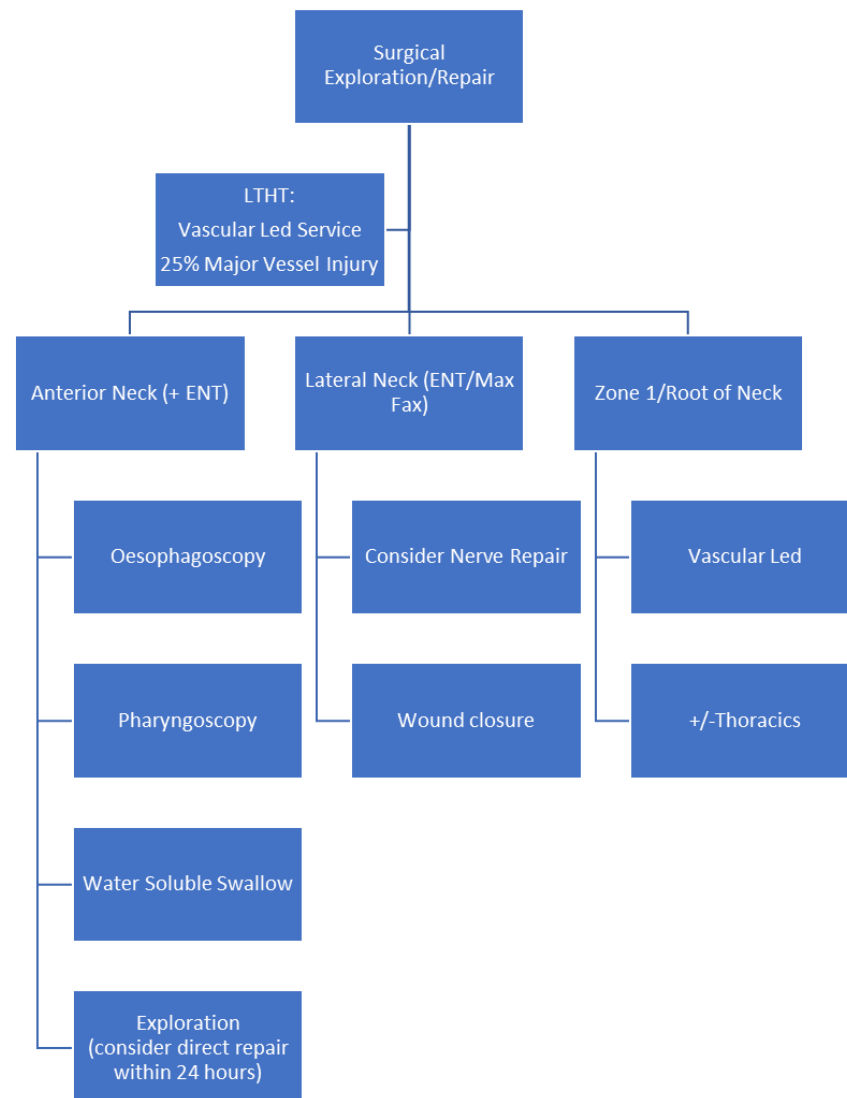
- 1) Do not remove impaled object
- 2) Beware of supraglottic airway ventilation- this may cause distortion of anatomy and gross surgical emphysema

Airway Considerations:

- 1) Bubbling airway
- 2) Altered anatomy from haematoma
- 3) In most cases of PNI, rapid sequence intubation (RSI) can be used to establish an airway when necessary.
- 4) Intubation should be performed under direct laryngoscopic or fiberoptic visualization.
- 5) Be ready for unexpected difficulty; prepare simultaneously for orotracheal and surgical airway management (i.e. double set-up)

Other Considerations:

1. Zonal management of neck is considered unsuitable by some
 - a. Transitioning of zones from entry point to damaged area
2. The stable patient should be managed with a CT-Angiography + IR and monitoring for 24-48 hours with baseline and subsequent neurological examinations
3. Zone 2 injuries remain the mainstay of surgical exploration





Head and Neck Soft Tissue Injuries and Lacerations

ALL soft tissue injuries to the head and neck should be referred to Maxillofacial Surgery if the initial injury is deemed complex for management within ED. This includes anatomically sensitive injuries at lip borders, ears, eyelids, nasal lacerations and scalp.

Delayed presentations of such injuries can sometimes be associated with wound infection. In such cases, it would be important to exclude any potential necrotising soft tissue infection which should be managed as an emergency.

Please document presence or absence of facial nerve movements on assessment.

Eyelid Lacerations

Check for underlying globe injury

Medial 1/3 lower eyelid injuries can be referred to Occuloplastics at SJUH to manage potential canalicular duct injury if suspected

Facial Burns

ABC approach, formal anaesthetic airway assessment as indicated. Consider early referral to regional burns unit

Ear Canal Injuries/Tympanic membrane injuries

Please refer these to the ENT department



Facial Fracture Pathway

Site	Imaging	Critical Checks	Management
Frontal Bone/Nasoethmoidal	CT scan	Is there a CSF leak? Are the fractures displaced more than the table width?	If CSF leak present, refer to <u>Neurosurgery</u> for monitoring If no CSF leak: Refer to <u>Maxillofacial Surgery</u>
Midface/Nasoethmoidal	CT Scan	Is there a CSF leak?	Instruct patient not to blow nose. Refer to <u>Maxillofacial Surgery</u>
Zygoma	Facial Views	Rule out globe injury <ul style="list-style-type: none"> • Snellen chart • Pupil response • Diplopia • Eye movement 	If <u>orbital compartment</u> syndrome suspected consider urgent referral to either <u>Maxillofacial Surgery</u> or <u>Ophthalmology</u> for time critical: <ul style="list-style-type: none"> • Lateral canthotomy • Dexamethasone/acetazolamide +/- mannitol (if no head injury)
Orbital Fracture	Facial Views and then CT orbits <u>if</u> patient has diplopia	Rule out globe injury <ul style="list-style-type: none"> • Snellen chart • Pupil response • Diplopia Eye movement- beware paediatric white eye blowout	
Nasal Bones	Facial views in presence of other fractures Otherwise clinical	Septal Haematoma- referral to ENT for drainage	If isolated nasal fractures referral to <u>ENT</u> Cas Clinic If part of other facial fractures, refer to <u>Maxillofacial Surgery</u>



Mandible including condyles	OPT and PA mandible	Ensure missing teeth accounted for- ? need for CXR. Consider antibiotic prophylaxis for open fractures (anything involving the dental segments)	Refer to <u>Maxillofacial Surgery</u>
Dentoalveolar Injuries	OPT +/- CT scan if large mobile segments	Account for missing teeth. ? Need for CXR	Refer to <u>Maxillofacial Surgery</u>
Temporal Bone Fractures	CT	Check facial nerve function, hearing and protect eye	Refer to <u>ENT/Neurosurgery</u>
Pan facial Injuries	CT	See individual fracture segments above Early airway management before swelling ensues	Refer to <u>Maxillofacial Surgery</u>
Dislocated mandibular condyle	OPT radiograph	Underlying neuromuscular cause for dislocation/connective tissue syndrome	Attempt reduction in ED, and refer to maxillofacial. If this is the first presentation, no follow up required. Refer recurrent dislocations to <u>Max Fax OPD.</u>
Laryngeal Fractures	CT	Monitor for airway oedema and consider early management before swelling	Refer to <u>ENT</u> . Note- these injuries are often associated with other <u>Maxillofacial</u> injuries requiring joint care



Indications for Prophylactic Antibiotic use in hard tissue fractures:

1. Only prescribe antibiotics for fractured mandibles when the fracture passes through a tooth bearing segment of jaw or is compound into the oral/facial soft tissues. Review Tetanus status.
2. Dirty/contaminated wounds
3. Isolated orbital and zygomatic fractures **DO NOT** require antibiotics