

Penetrating Neck Injuries Focus on Zone II

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Case Presentation

- **27 yo M with PMHx of asthma**
- **Single stab wound (SW) to left neck**
- **Slash wound over posterior scalp**

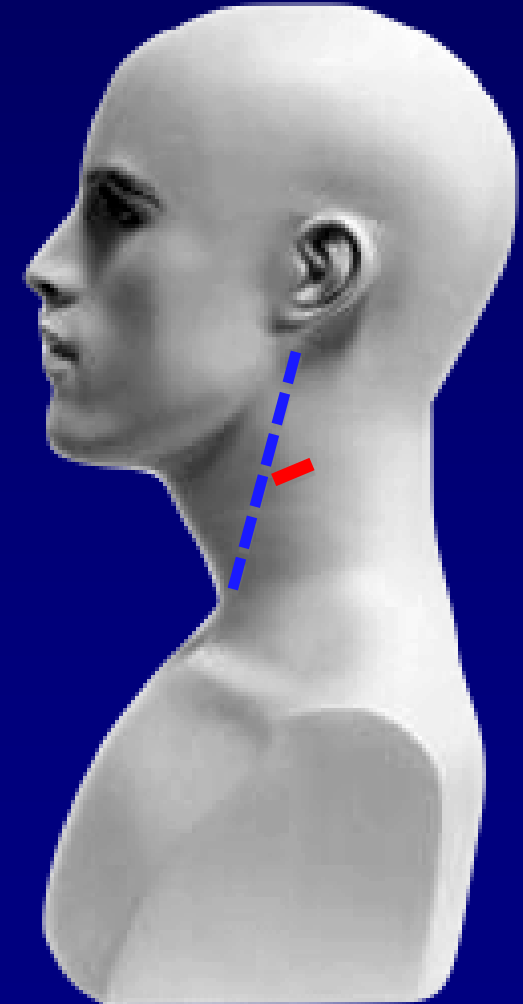
On Physical Exam

- **BP 151/93 HR 97 RR 20 Sat 100%**
- **Head: posterior scalp 6 cm slash wound, no hoarseness**
- **Neck: zone II injury**
- **Chest: clear bilaterally**



Neck Exploration

- Facial vein ligated
- Carotid sheath intact
- Aerodigestive tract intact
- Stab wound explored
 - Only muscle bleeding





Management of Zone 2

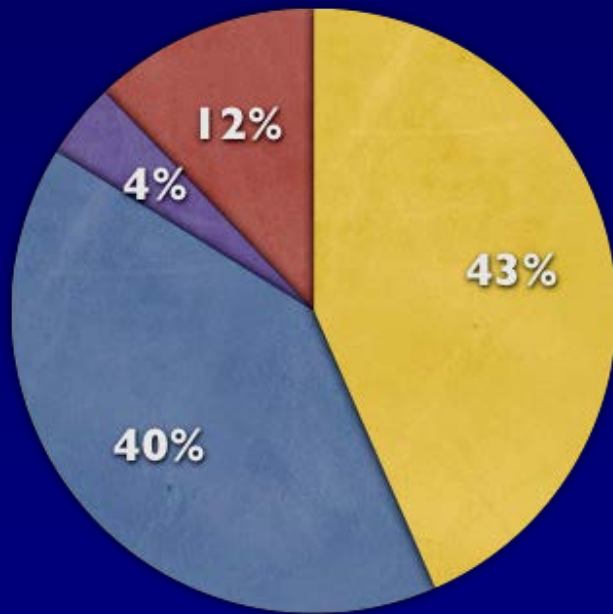
Penetrating Neck Injury (PNI)

- **Epidemiology**
- **Immediate Concerns**
- **Stable vs Unstable Pt**
- **Operative Principles**
- **Management Specific Injuries**



Penetrating Neck Injury

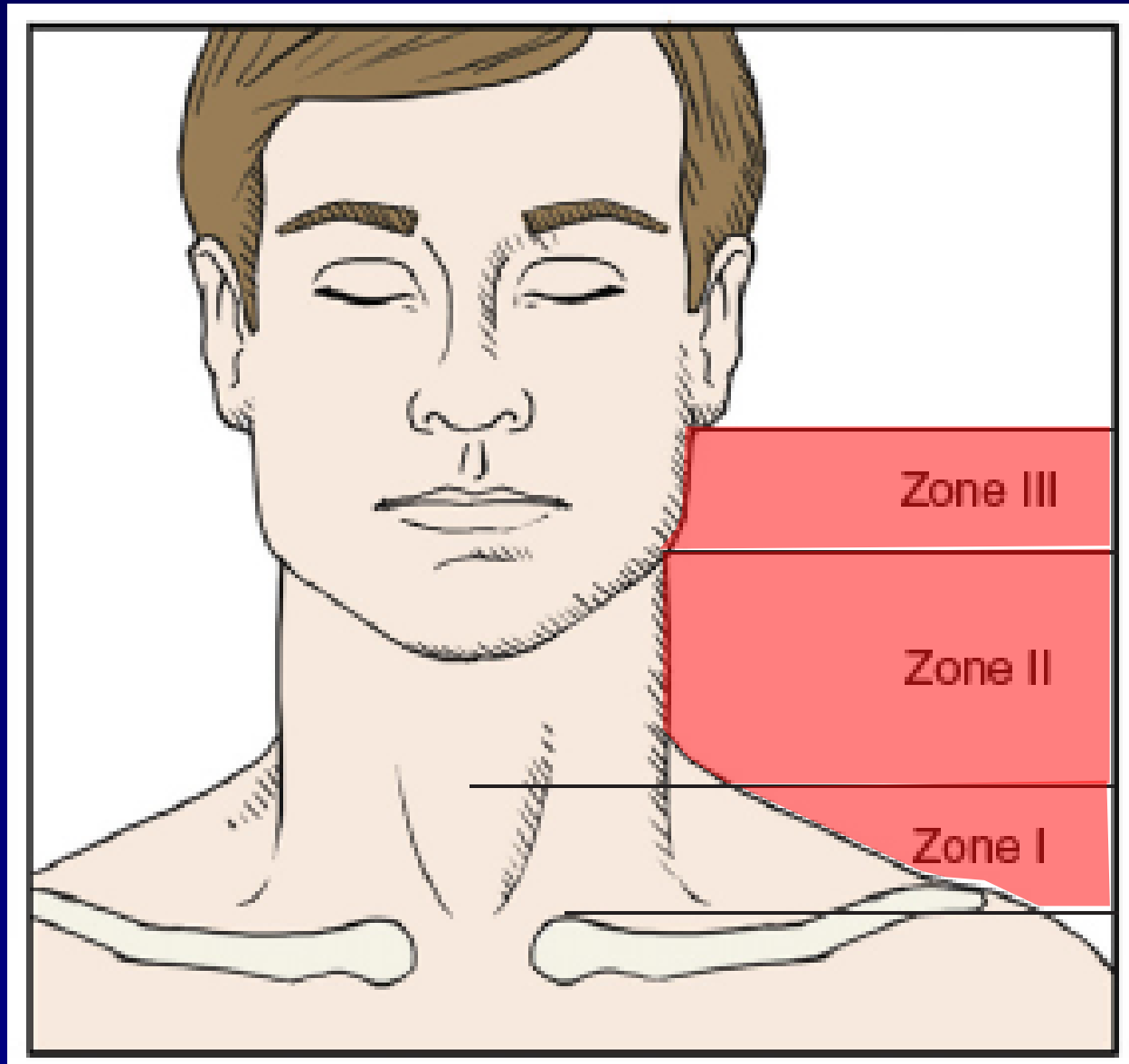
Etiology of PNI



- Firearms
- Stab Wounds
- Shotguns
- Other Weapons

➤ Injuries in 35% of gun shot wounds (GSW) → **16.5%** require operation

➤ 20% of stab wounds (SW) have injuries → **10%** require surgery



Immediate Concern: Airway

- Immediate definitive airway control
- Rapid sequence intubation common
- Best with fiberoptic visualization

Indications

Hematoma

Hemoptysis

Subcutaneous emphysema

Bruit or thrill

Neurologic deficit

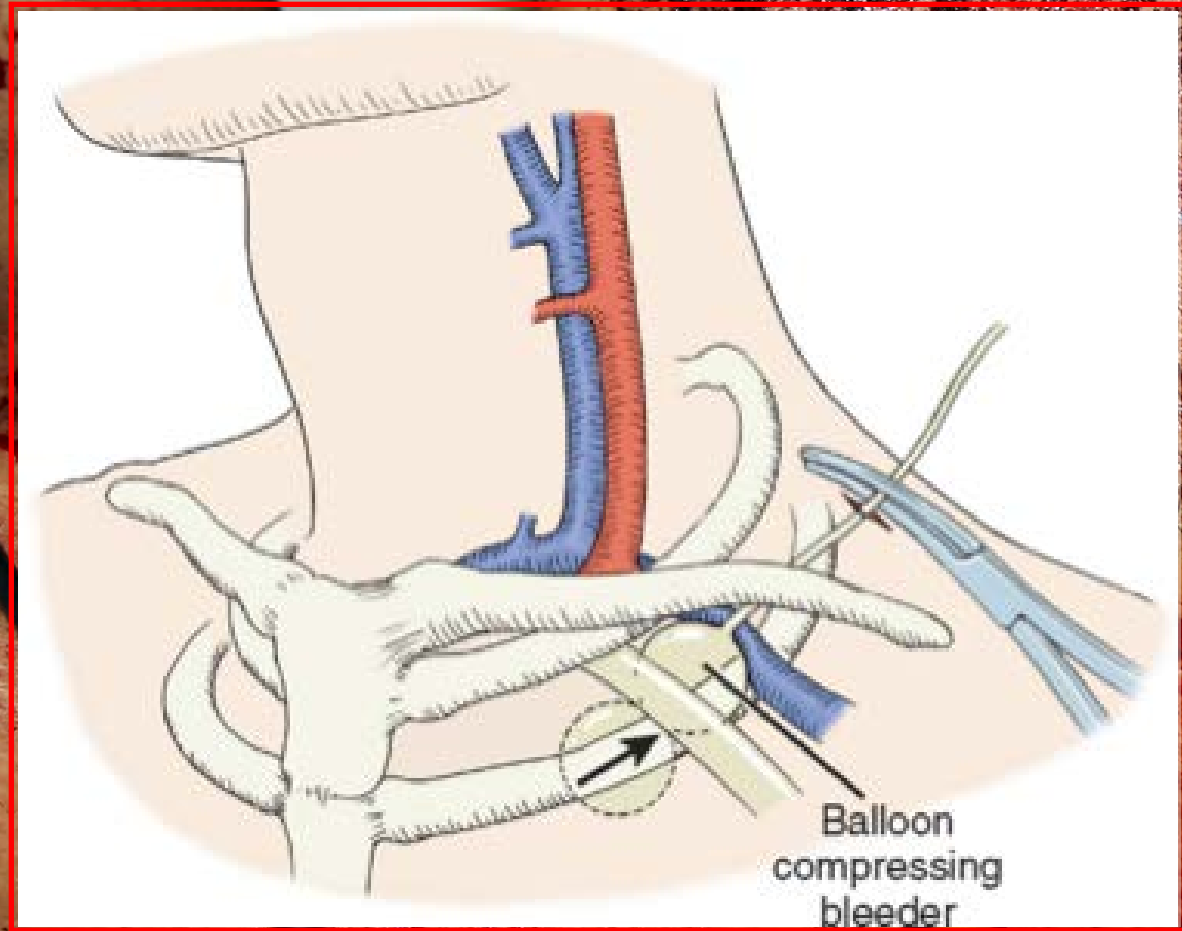
Stridor

Abnormal voice



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Immediate Concern: Bleeding Control



Lose the Collar ?

- No role in penetrating neck injuries
- Key signs were exposed neck in 22%
 - Expanding hematoma
 - External hemorrhage
 - Subcutaneous emphysema
- C - spine injuries in 3.7%
 - Collar may have benefited 1.4%

PLATYSMA

Mandatory Exploration

- Pre – WWII, pts treated expectantly →
35% mortality rate
- Exploration for ALL pts reduced
mortality, but 58% negative exploration
- Role for “Selective Non-operative
Management”?

What Next ?

Unstable

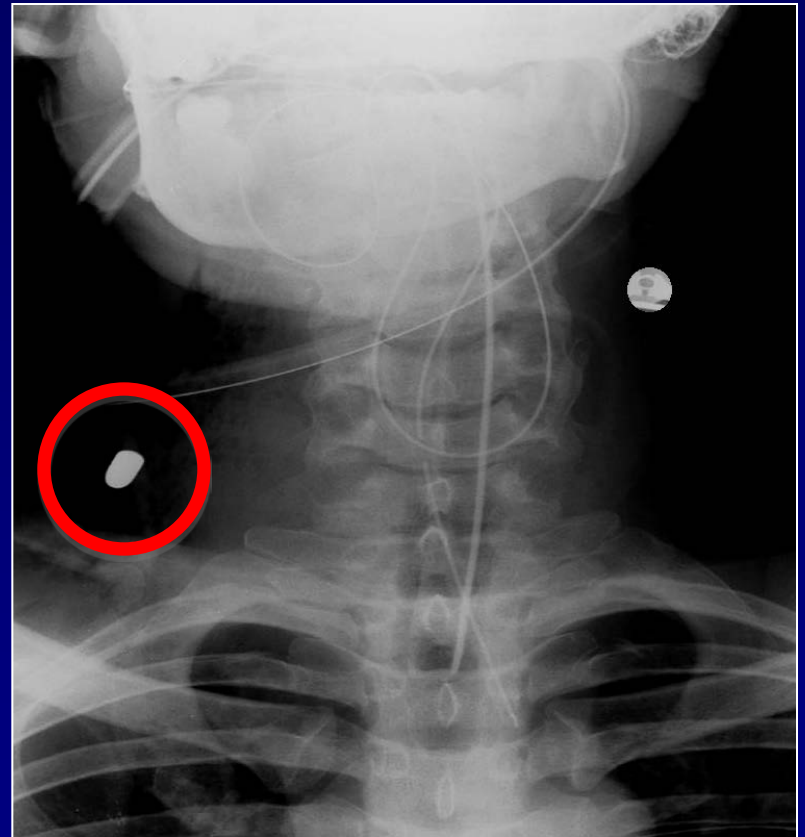
Stable

- External bleeding
- Expanding hematoma
- Massive emphysema
- Airway compromise



Initial Imaging

- **Chest X-ray →**
rule out
pneumothorax
- **Neck X-rays →**
localize foreign
bodies

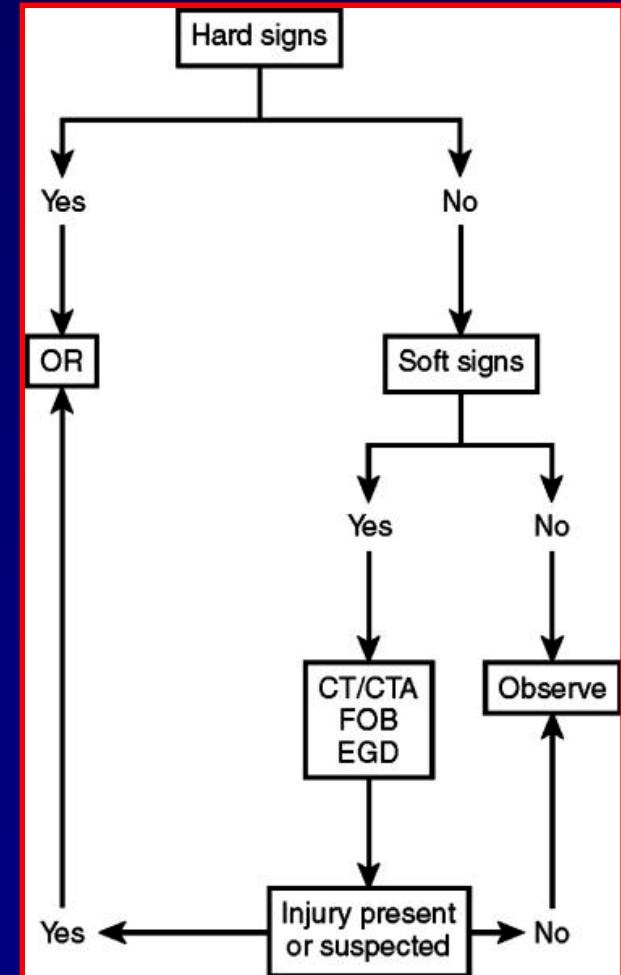


Exam Predicts Injuries

- Older reports claimed PE unreliable
- Last 20 years suggest PE good predictor of injury
 - ~ 95% sensitivity
- Low threshold for imaging

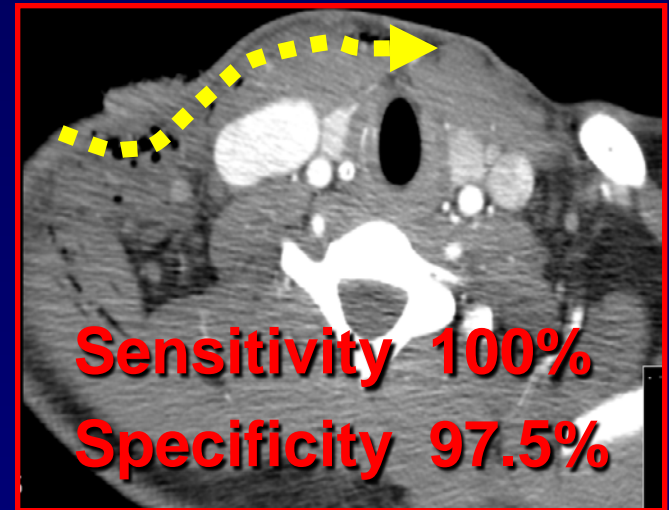
Selective Exploration

- **Selective management is safe for asymptomatic or hemodynamically stable Zone II injuries**



Role of CT Angiography

- **Delineate trajectory**
 - ↓ work up in 30-60%
- **Definitive imaging**
 - Resource dependent
 - Misses esophageal perforations !



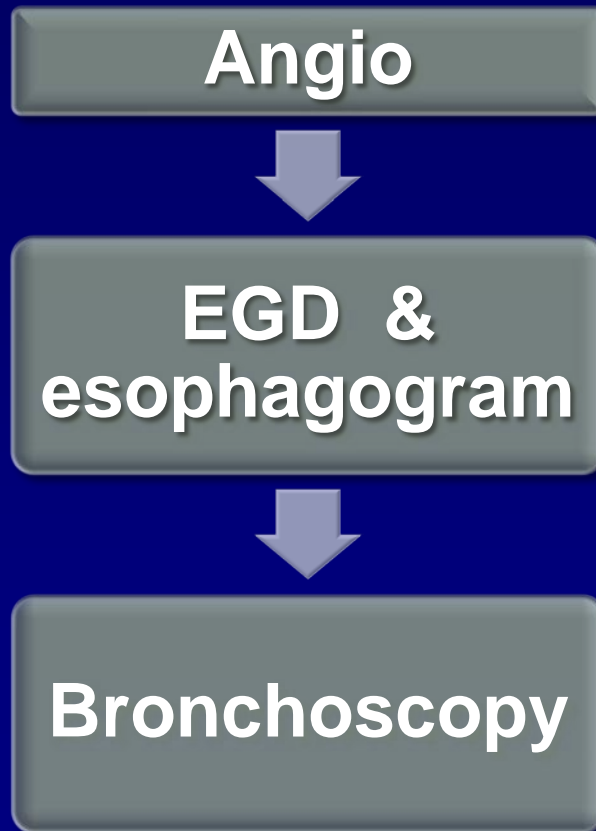
Injured Esophagus

- **Injuries carry high morbidity & mortality**
- **Diagnostic delays ↑ morbidity**
- **Either esophagogram or esophagoscopy**
- **NPO & IV antibiotics safe**



Changing Algorithms

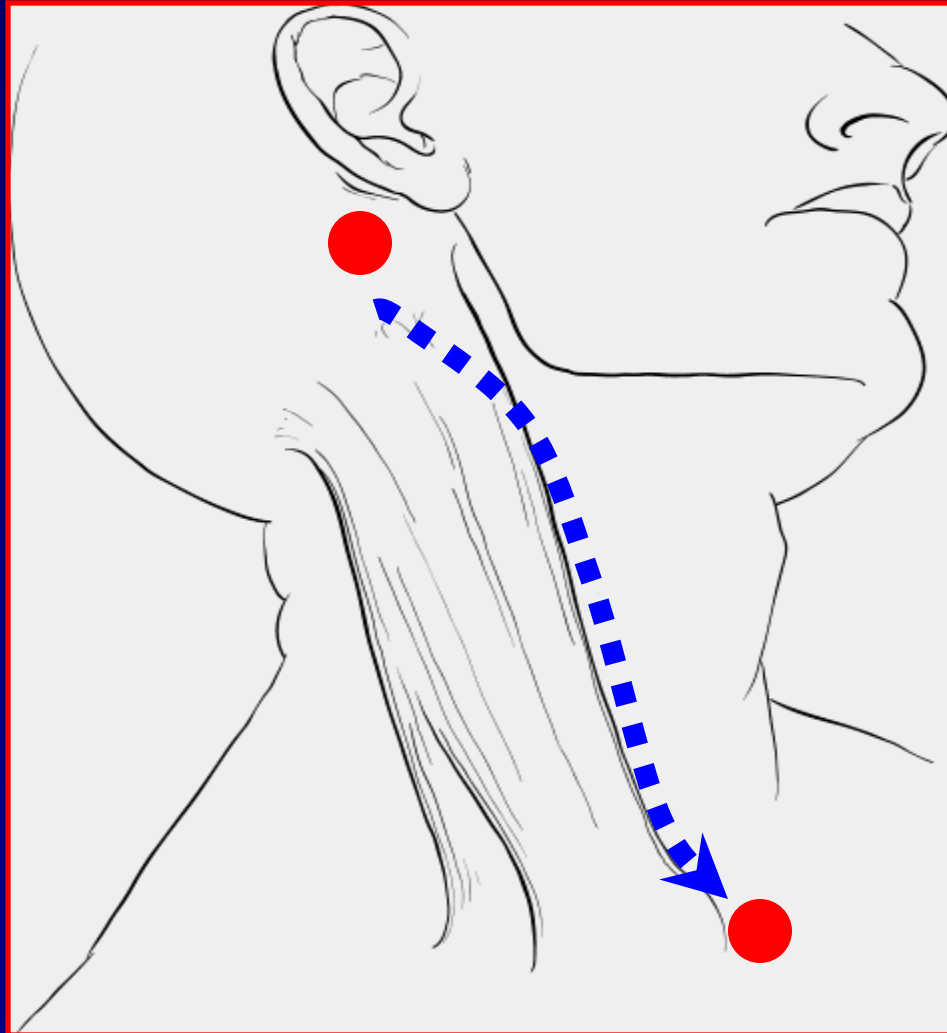
OLD



NEW

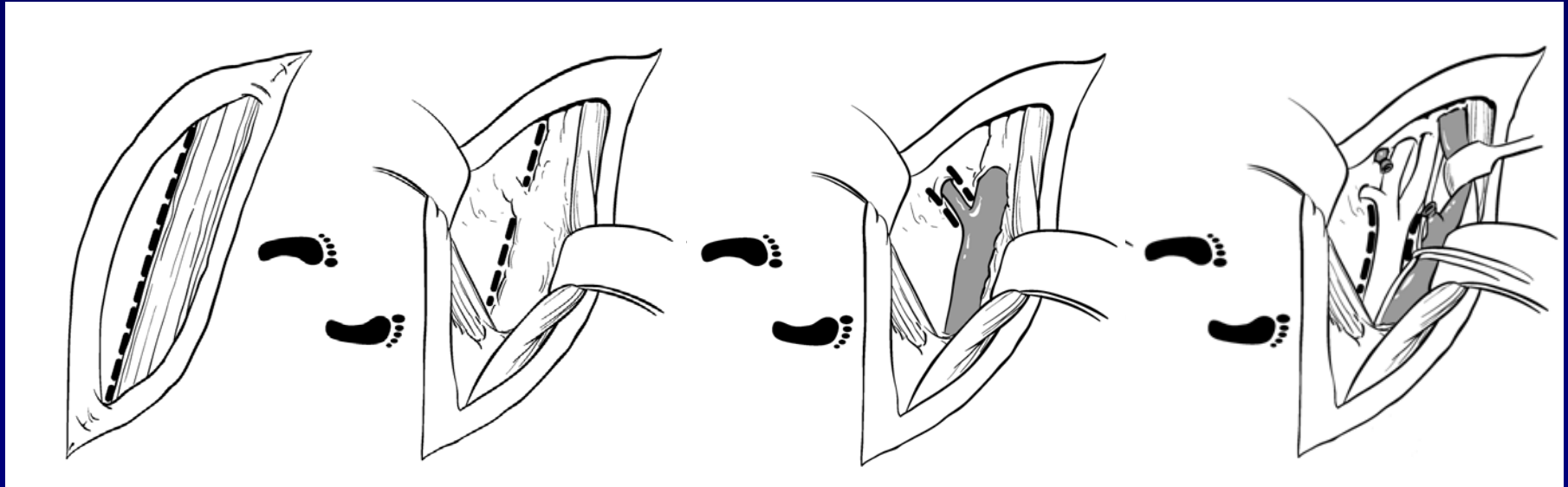


Operative Principles



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Operative Principles: “Trail of Safety”

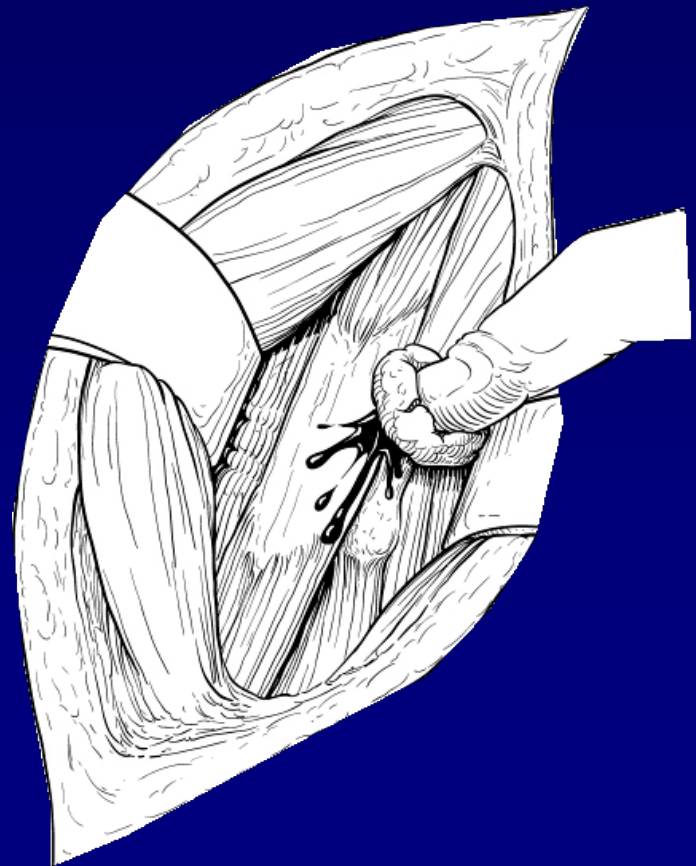


Mind the vagus nerve !

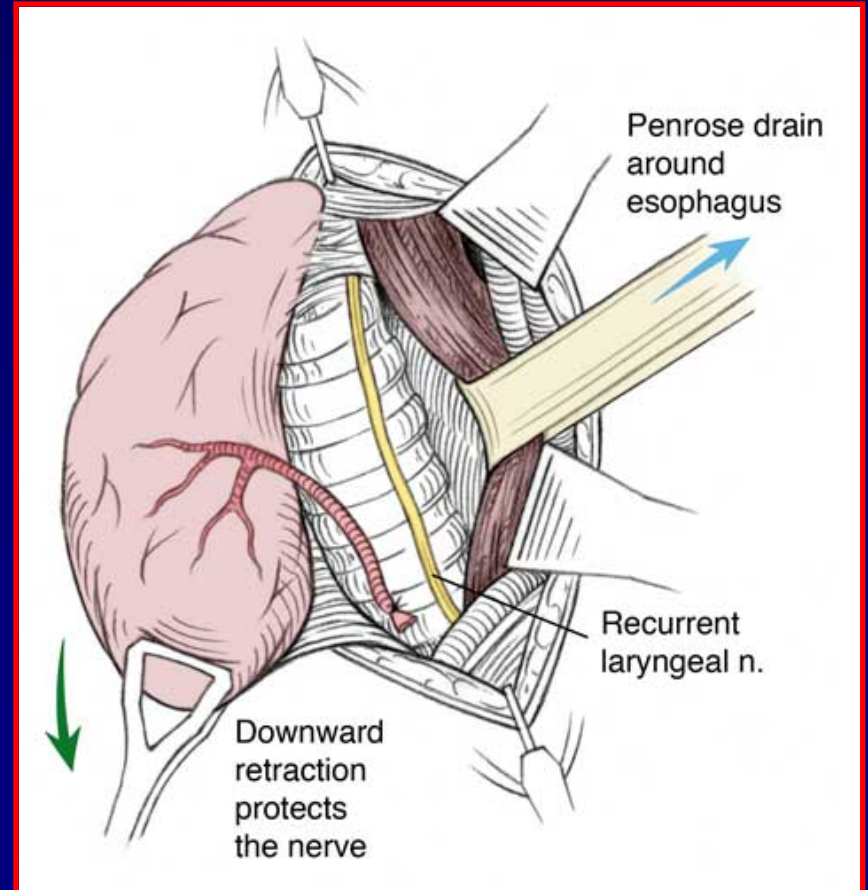
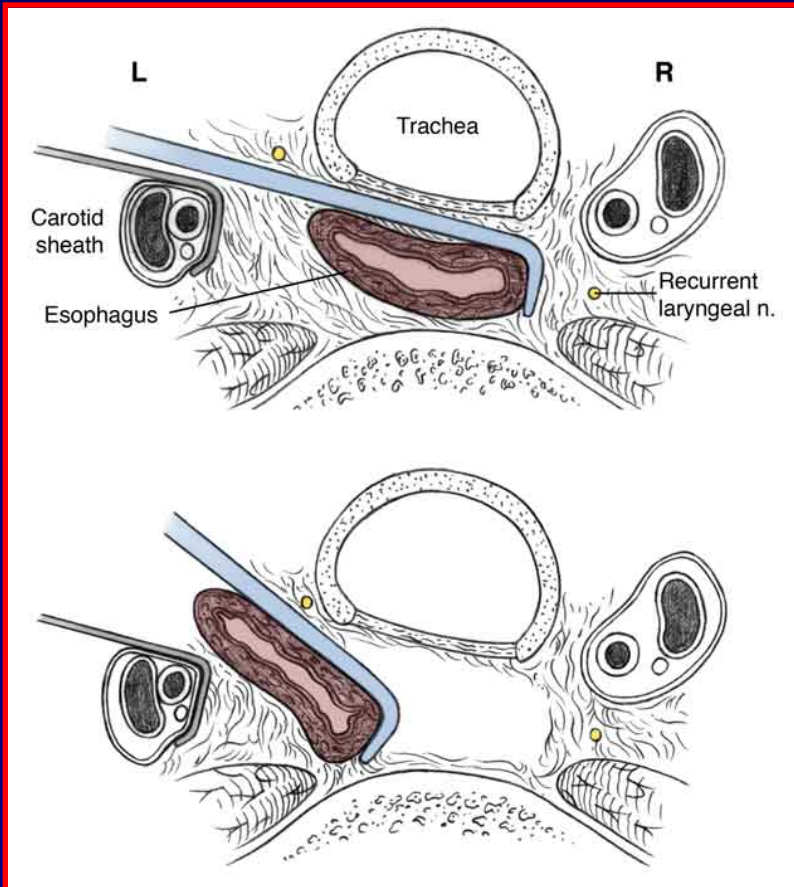
Carotid Injuries

- **Debridement & repair**
- **Interposition graft**
- **Pericardial patch**
- **Ligate injured ext. carotid artery**

Vertebral Artery Injury



Esophageal Injury



Tracheal Injury

- **Simple injury**

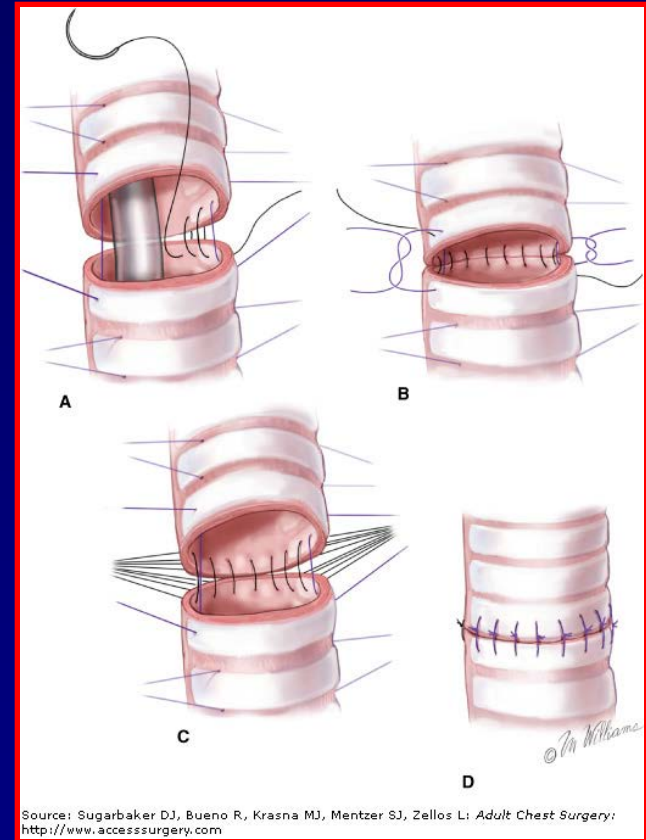
- **Close the injury**

- **Absorbable suture**

- **No tracheostomy**

- **Complex injury**

- **Immediate vs. delayed reconstruction**



Summary

- **Address life-threatening concerns first**
- **Unstable patients require exploration**
- **Controversial management of zone II neck injuries**
- **CT angiogram use emphasized in new algorithm for zone II injuries**
- **Follow the “Trail of Safety”**



A 26-yr old M presents with an isolated GSW in Zone II of the right neck. There is a pulsatile neck hematoma with subcutaneous emphysema. The pt has left-sided motor weakness and GCS 9. Initial SBP is 80 mmHg. The most appropriate initial mgmt of this patient's airway would be:

- A. laryngeal mask
- B. orotracheal intubation**
- C. cricothyroidotomy
- D. tracheostomy
- E. esophageal tracheal airway

The next procedure in the above patient would be:

A. bronchoscopy of the neck

B. angiography

C. neck exploration

D. upper endoscopy

E. Doppler ultrasound of the neck

References

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