

Esophageal injuries

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Pre-test 1

- What is the most common cause of esophageal injuries?
A. Traffic accidents
B. Gunshot wounds
C. Iatrogenic

Pre-test 2

- Which contrast agent is more likely to cause severe pneumonitis if aspirated?
A. Barium
B. Gastrografin

Pre-test 3

- Which of the following drugs is indicated in treating impacted food in esophagus?
A. Glucagon
B. Primperan
C. Buscopan

Pre-test 4

- When treating esophageal foreign body, which of the followings is considered an emergency?
A. Coin in esophagus causing severe stridor
B. Sharp ended toothpick in esophagus
C. Disk battery in esophagus
D. All of the above

Pre-test 5

- Which of the followings is contraindicated in treating acid ingestions?
A. NG aspiration
B. Cold water lavage
C. Antacids

Agenda

1. Esophageal perforations
2. Esophageal foreign bodies
3. Chemical injuries of the esophagus

Pathophysiology

- Lack of serosal covering
→ anastomotic leak more likely
- Most injuries to the esophagus are **iatrogenic** and tend to occur at natural or acquired areas of narrowing

Pathophysiology

- Toxicity of esophageal rupture
 1. Chemical mediastinitis
 - from regurgitated gastric secretions
 2. Suppurative mediastinitis
 - from infection

Mortality

- Depends on time of definitive treatment:
 - Within **12h**: 5~25% mortality
 - 12~24h: 10~44% mortality
 - Beyond 24h: 25~66% mortality
- Cause of death = severe suppurative mediastinitis; developed within 6~12h

Esophageal perforations

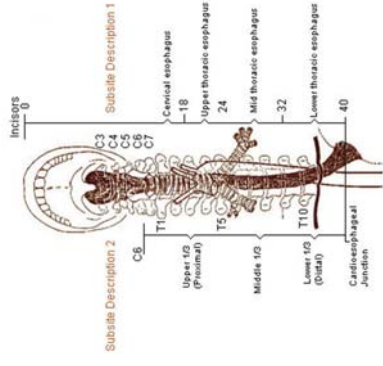
Esophageal perforations

- Etiology
 1. **Iatrogenic** trauma (~66%)
 2. Penetrating trauma
 3. Blunt trauma



iatrogenic trauma

- During efforts to dilate strictures
- During diagnostic endoscopy
 - biopsy, removal of sharp FB
- Sites prone to perforate:
 1. Esophageal introitus at the **cricopharyngeus**
 - narrowest, most commonly perforated
 2. Diaphragmatic hiatus
 3. Left mainstem bronchus



Penetrating trauma

- Caused by stabs or gunshot wounds
- Types:
 1. **Cervical:**
 - more common
 - mainly caused by stab wounds
 2. Intrathoracic / intraabdominal
 - less common
 - mainly caused by gunshot wounds

Blunt trauma

- Rare
- 70% cervical portion
- Mechanism
 1. Intraluminal pressure → rupture
 2. Compression → tear
 3. Contusion → necrosis

Esophageal injury

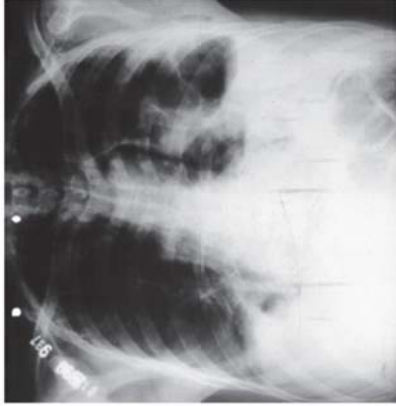
- When to suspect?
 1. Presence of pleural effusion or pneumothorax in patients with **penetrating wound** in thoracic inlet or mediastinum
 2. Cervical, thoracic, or abdominal symptoms after esophageal **instrumentation**

Esophageal perforation

- Symptoms
 1. **Chest/back/shoulder pain**
 2. **Abdominal pain** and tenderness
 - lower esophageal perforation
 3. **Difficult swallowing** (dysphagia)
 4. **Painful swallowing** (odynophagia)
 5. **Hematemesis**

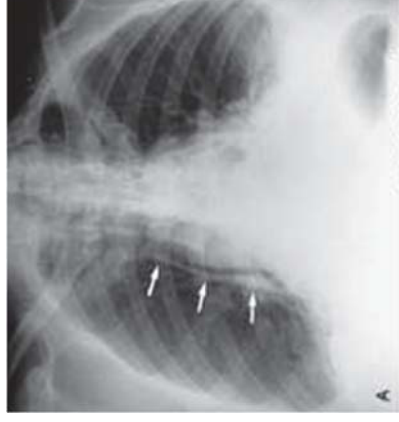
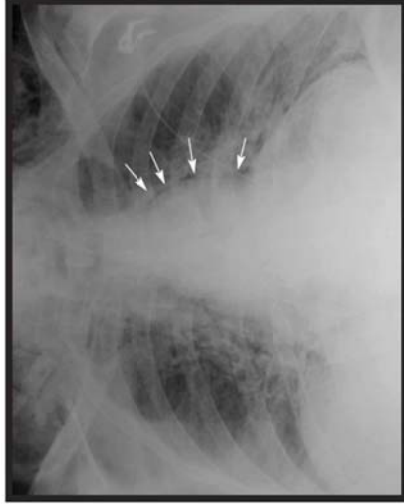
Esophageal perforation

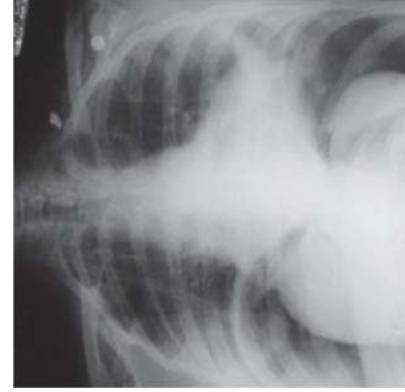
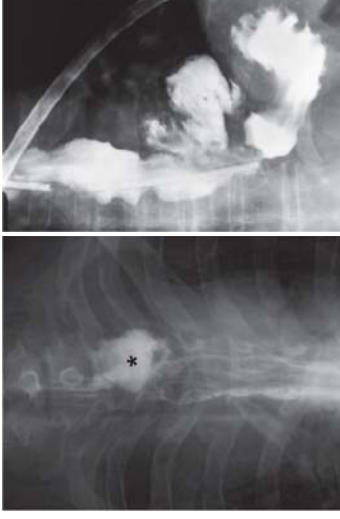
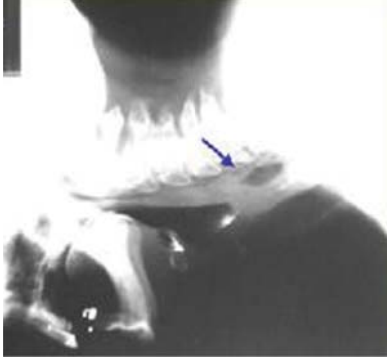
- Signs
 1. **Emphysema / pneumomediastinum**
→ mediastinal / cervical
 2. **Pleural effusions** with increased amylase after chest trauma
 3. **Pneumothorax**
 4. **Fever / sepsis**



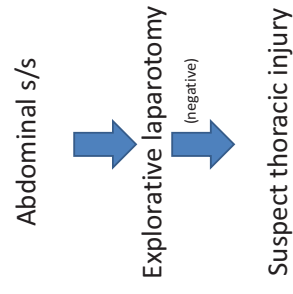
Esophageal perforation

- Diagnostic tests
 1. CXR
 2. Contrast swallows / esophagography
 - **Gastrografin**:
40~50% false negative
cause severe pneumonitis if aspirated
 - Barium:
< 25% false negative
aggravate mediastinitis if leaked
 3. CT scan
 4. Esophagoscopy





Blunt truncal trauma



Esophageal perforation

- Management
 - Surgery
 - esp. if sepsis present
 - Small **iatrogenic** injuries of cervical esophagus or pharynx with contained leak can often be managed nonoperatively
 - 1. NPO + NG drainage
 - 2. Antibiotics - cover **mouth** organisms

Esophageal perforation

- Complications
 1. **Sepsis** – most deadly
Negative contrast swallow / esophagoscopy does not rule out mediastinitis / abscess
 2. **Fistulas**
In neck → heal in 2~3 wk
In chest → sepsis and death
 3. **Strictures**
DO dilation / colon bypass

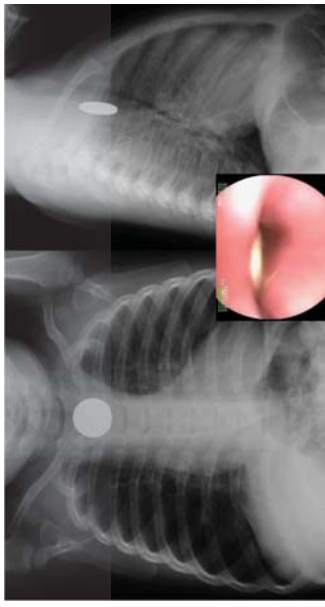
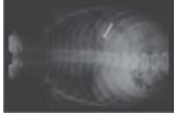
Esophageal foreign bodies

Esophageal FB

- Risks:
 1. Children
 2. Psychiatric disease
 3. Alcohol abuse
 4. Mental retardation
 5. Elderly – dentures
 6. Preexisting strictures – food impaction

Esophageal FB

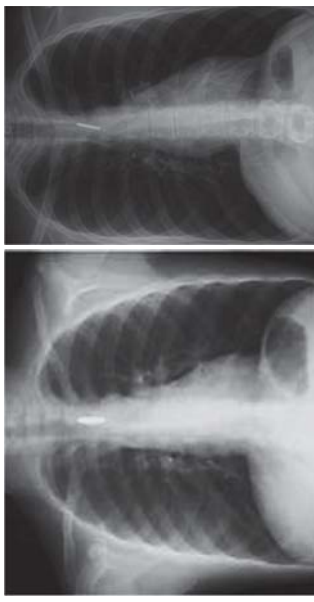
- Emergencies:
 1. Acute obstruction
 2. Sharp or irregular FB
 - e.g. toothpicks, pins, dentures
 3. Disk battery
- Caution:
 1. Keep patient in upright position
 2. Suction for oral secretions



Esophageal FB

- Coins on CXR:

PA → “on face”; lat → “on edge”
- FB removal
 1. Delayed → edema → difficult to removed
→ increased risk of perforation
 2. After removal: check with CXR / endoscope



Esophageal FB removal

Catheter removal - E.g. Foley catheters

- Insert catheter past the object
- Lower head and neck
- Balloon inflated
- Catheter gently pulled back

Esophageal FB removal

Glucagon +/- gas-forming compound

- FB not sharp and patient not compromised
- Glucagon relaxes smooth muscles and LES
- May stimulate nausea
- Dose: 1-2 mg of glucagon intravenously (0.02-0.03 mg/kg in children, not to exceed 0.5 mg)
- May be followed by ingestion of [**E-Z Gas + 240 mL water**]. Hint: use carbonated beverages if E-Z Gas not available

Chemical injuries of the esophagus

Chemical injuries

- S/S: sudden difficult or painful swallowing
- Chemicals
 1. Strong acid → coagulation necrosis
 2. Strong alkali (pH > 12) → **liquefaction necrosis** → muscle layers
- Disk batteries
 1. Severe corrosive injury
 2. Leaking NaOH, KOH, mercury oxide

Chemical injuries

- Endoscopy
 - Do not pass beyond the 1st deep **circumferential** burn → easy perforation
 - Need antistricture management

Mild alkali

- E.g. small amount of bleaches
- May cautiously give **milk**, dilute **vinegar**, or **citrus** juice

Strong alkali

- **Lye** ingestion (鹼液)
 - Contraindications for emetics, charcoal, NG lavage



Acid ingestion

- Early NG aspiration
- Cold water lavage
- **Antacids** are contraindicated (neutralization produces heat)



Corticosteroids

- The use of corticosteroids for caustic ingestions is **controversial**
 - Current tendency – avoid steroids
 - Literature reviews – steroids may be helpful in preventing strictures in severe cases

Take home message

1. Low incidence, high morbidity/mortality
2. Commonly iatrogenic
3. Abdominal presentations probable
4. Check pleural fluid amylase
5. Beware of lye and disk battery
6. Repair within 6~12 h

Thank you