Deadly Causes of Chest Pain

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What are the 6 causes of chest pain that can kill?
Case

56 yo M with DM, HTN, and tobacco use complains of Chest Pain while in the CDU
Key Initial Evaluation

- **Gen Appearance** (diaphoresis = bad)
- **Vital Signs** (hypotension = bad)
- **Heart** (Muffled? Regular? Fast?)
- **Lungs** (Equal? Wet? Wheezing?)
- **Extremities** (=pulses?, ➪ cap refill = bad)

➢ Any bad sign = ABC’s and call CDU doc
Key Initial Evaluation

*EKG for all; CXR for most (portable)

Get more information

Location: Central, left, or right

Radiation: Back, neck, arm

Assoc symptoms: SOB, nausea

Timing: Gradual or sudden onset

Provocation: What makes worse or better?

Severity: Scale of 1-10
ACS = STEMI

1. ST elevation in 2 contiguous leads (II, III, aVF) with reciprocal ST depression (V1-V3)
2. 1mm in inferior leads, 2mm in anterior leads
Importance of Repeat EKG’s

- Repeat EKG every 5-10 min while CP ongoing
- Hyperacute T waves is an early and transient EKG finding in early STEMI
Diagnosis?

**Signs**
- Tachycardia > 100 beats per minute
- Tachypnea > 20 bpm
- Hypoxia < 95% on RA
- Lungs clear
- Extremities: equal pulses, +/- unilateral swelling or immobilized or recent injury

**Symptoms**
- SOB or dyspnea - Present in 90%
- Chest pain (pleuritic) - 66% of patients with PE
- Cough
- Sudden onset
- Gen Appearance: anxious
Pulmonary Embolus
Risk Factors

Hypercoaguability
- Malignancy, pregnancy, estrogen use, factor V Leiden, protein C/S deficiency

Venous stasis
- Bedrest > 48 hours, recent hospitalization, long distance travel

Venous injury
- Recent trauma or surgery
PE EKG: Sinus Tachy most frequent finding; Classic S1,Q3,T3 seen in <20%
PE Diagnosis and Treatment

D-dimer - Sensitive in low to mod probability (A neg d-dimer = >99% no PE); not sensitive enough for high probability; Lots of false positives (renal, CA, aortic dissection)

CTA chest = Gold Standard if mod-high probability

IV fluid to maintain BP

Heparin (limits propagation, doesn’t dissolve clot
  Unfractionated or Fractionated (NOAC)

Fibrinolytics (tPA) - if pt is unstable, RV strain
Diagnosis? (tough one)

- **Signs** – BP generally high, but VS variable

- **Symptoms**
  - Chest or back pain – ripping/tearing in 50%
  - Neurologic symptoms in 20%
  - Asymmetric pulses and BP readings L vs. R
  - Pre-syncope or Syncope

- *CP +/- BP AND Neuro symptoms = aortic dissection until proven otherwise*
Aortic Dissection
Risk Factors

- **Bimodal distribution**
  - Young: Connective tissue (Marfan) or pregnancy
  - Older: Most commonly > 50 (mean age 63)

- **Risk factors**
  - Male: 66% of patients
  - Hypertension: 72% of patients
  - Connective tissue dis-30% of Marfan’s
  - Cocaine Use
  - Syphilis
Aortic Dissection Diagnosis and Treatment

- **CXR**- Widened mediastinum (not sensitive)
- **CTaNGIO chest**- Very sensitive and specific or TEE
- **Bedside US** – evaluate aorta and look at heart to r/o tamponade
- **CT surgery early**
- **Blood pressure control**
  - Goal SBP 120-130 mmHg
  - Beta blockers are first line (Labetalol and Esmolol)
  - Then can add vasodilators i.e. nitroprusside
Diagnosis?

**Signs** – VS variable; if severe: tachycardic, hypotensive and hypoxic, distended neck veins, tracheal deviation

**Symptoms**
- Pleuritic chest pain - sharp
- Decreased breath sounds on one side
Tension Pneumothorax
RF, Diagnosis

Trauma (rib fx), iatrogenic (s/p central line placement, thoracentesis), positive P ventilation (vent, BiPap), COPD, connective tissue dis
Tension Pneumo Treatment

- Needle decompression, Chest Tube
Diagnosis?

**Signs**
- Tachycardia, hypotension (if severe)
- Muffled heart sounds
- Lungs clear

**Symptoms**
- SOB or dyspnea
- Chest pain (positional)
- General appearance = Anxious
Cardiac Tamponade - Diagnosis

- Pericardial friction rub; Kussmaul sign=↑JVD w/inspiration
- CXR - large cardiac silhouette; EKG – tachycardia first, then ↓QRS amplitude (low voltage), then electrical alternans
Beck’s Triad
Seen in Acute Tamponade
Risk Factors/Etiology

- Malignancy, s/p radiation therapy
- Renal failure (uremia)
- Pericarditis
- Lupus
- s/p AMI or cardiac cath or CV surgery
- Trauma (usually acute)
- Infections – HIV, TB
Cardiac Tamponade Treatment

- O₂, IVF to increase preload, elevate legs to increase venous return; no NIPPV (Bipap)
- STAT bedside echo, pericardiocentesis (bedside if in shock); Cardiology/Cardiothoracic Sx for pericardial window
Diagnosis?

**Signs**
- Tachycardia, tachypnea, fever (variable)
- Lungs clear
- Extremities: equal pulses

**Symptoms**
- Dyspnea, dysphagia
- Chest pain (pleuritic)-lower chest, epigastric
- Radiation to back (sometimes)
- Sudden onset if after protracted vomiting; Gradual onset if after EGD
Esophageal Rupture, RF

Aka Boerhaave Syndrome

Mackler Triad (50%): middle-aged man h/o dietary overindulgence and overconsumption of alcohol + CP/subQ emphysema after recent vomiting/retching

Tear in the esophagus leads to leaking of GI contents into the mediastinum

Inflammation followed by infection cause rapid deterioration, sepsis and death

Risk Factors: iatrogenic (EGD esp w/dilation), severe retching, trauma, foreign bodies, toxic ingestion
Esophageal Rupture Diagnosis & Treatment

CXR: SubQ and/or mediastinal air

NPO, antibiotics, supportive care, Surgical consult

Small tears managed conservatively
Deadly causes of Chest Pain

- Acute Coronary Syndromes
- Pulmonary Embolism
- Aortic Dissection
- Pneumomotorax
- Cardiac Tamponade
- Esophageal Rupture