

AORTIC DISSECTION/ANEURISM RUPTURE

(Last updated 08/07/2019; Reviewed by: Svetlana Herasevich, MD)

PRESENTING COMPLAINT: Severe chest pain with back or abdominal radiation

FINDINGS

- **A** Normal
- **B** ↑ RR, shortness of breath
- **C** ↓ BP, peripheral pulse deficit, inter-arm variation in pulse/BP (>20mmHg)
- **D** Variable altered
- **E** Pale skin, increased sweating, syncope, abdominal (pulsatile) mass.
- **L_{PC}** CBC-↓Hb, type and crossmatch, lactate, PT/APTT, cocaine screen, creatine kinase, troponin, D-dimer
- **U_{PC}** Pulsatile mass

***V** (verbal), **P** (pain), **U** (unconsciousness), **D** (delirious)

U_{PC} (point of care ultrasound) **L_{PC}** (point of care labs)

OTHER HISTORY

- **Predisposing Conditions**
 - History of hypertension, atherosclerosis, age >60, preexisting aortic aneurysm, vasculitis, collagen disease, family history of aortic disease, aortic surgery, cardiac catheterization, intense resistance training, cocaine, trauma
- **Symptoms**
 - Severe **chest pain** with **back or abdominal radiation**; peripheral **pulse deficit**, inter-arm variation in pulse/BP (>20mmHg); **hypotension/shock**
 - **Potential extension** to coronary/branch vessels, aortic valve and pericardial space: **syncope**, cerebral/myocardial/splanchnic/limb ischemia, **heart failure**, **aortic regurgitation**, **tamponade** or continued **hemorrhage** into pleural or retroperitoneal space, left vagus/left recurrent nerve; distal embolism due to aneurysmal thrombus
 - **Abdominal (pulsatile) mass/distension** (physical exam/bedside ultrasound)

DIFFERENTIAL DIAGNOSIS

Other etiologies of chest pain (MI, PE, pneumothorax) and/or shock

OTHER INVESTIGATIONS

- **Monitoring**

- **ECG:** ST-T changes if associated myocardial ischemia, close blood pressure monitoring - consider arterial line, monitor peripheral pulses
- **Imaging**
 - **CXR:** Wide mediastinum or aorta, pleural effusion (hemothorax), tracheal displacement
 - **ECHO (transesophageal > transthoracic) and/or CT chest (or cardiac MRI):** Location, size and extension/rupture of dissection (Stanford classification: types A/B) or aneurysm (-risk if diameter >4cm); +/- cardiac complications
 - **Abdominal CT/ultrasound**

THERAPEUTIC INTERVENTIONS

- **Immediate treatment**
 - **Shock or airway compromise**
 - Intubation, fluids/transfusion of blood products +/- vasopressors
 - Investigate for hemorrhage (fistula or rupture), valvular or left ventricular dysfunction
 - **Emergent intervention (surgical or endovascular stent-graft):** if acute ascending AD and/or progressive descending AD with complications or symptomatic AAA with rapid expansion/rupture
 - **Medical treatment:** if hemodynamically stable descending AD or asymptomatic AAA (<5cm diameter)
 - **Lower blood pressure and decrease LV contraction velocity:** IV beta blockers (if contraindicated: calcium channel blockers); Goal: SBP = 100-120 mmHg & HR ≤60 bpm; add nitroprusside if needed. Consider arterial line placement
- **Analgesia:** opioids
- **Consults:** cardiothoracic/vascular surgery

ONGOING TREATMENT

- **Serial imaging (US/CT):** assess eventual progression/expansion
- **Treatment**
 - Delayed surgical/endovascular intervention: if complication or expansion of descending aorta dissection or aneurysm, severe uncontrolled hypertension or pain, Marfan syndrome association
 - Continuous medical treatment if uncomplicated descending aorta dissection: transition to oral beta blocker when HR is controlled

CAUTION

- **Diagnosis:** If history of chest trauma (e.g. acute deceleration), rule out aortic isthmus rupture
- **Treatment**
 - Consider associated **stroke as relative contraindication to urgent surgical intervention** due to a risk for hemorrhagic cerebral infarction
 - **Risk of mesenteric ischemia or ischemic colitis** in the post-operative period
 - Monitor renal function in AAA
 - Repeat neurological examination, abdominal examination and renal function assessment in AD to monitor the potential extension of the dissection to main branches of the aorta
 - Risk of sudden death by aorta rupture or acute aortic regurgitation
 - Worse prognosis when acute onset, shock, > 70 yo, associated complications, renal failure

REFERENCES & ACKNOWLEDGMENTS

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