Abdominal Aorta Ultrasound Cheat Sheet

Clinical Application

Basics

- 90% mortality rate of rupture
- Suspect AAA in any pt >60 yo with abdominal or back pain
- Screen all > 60 yo males with hx of HTN or smoking at least once
- Small AAAs (<4.5 cm) rupture less frequently than larger AAAs

Sensitivity & Specificity

- High sensitivity for presence of AAA
- Poor sensitivity for acute rupture
- Rupture usually into retroperitoneal space & US isn't great at detecting retroperitoneal bleeds

Anatomy

Normal Anatomy

- Aorta bifurcates at umbilicus (T5)
- 1st branch: celiac trunk
- Hepatic and splenic artery come off CT
- 2nd branch: super mesenteric artery
- SMA is about 1 cm caudal to CT & runs parallel to aorta

Anatomy of AAA

- Two types of AAA: fusiform and saccular
- Fusiform: dilation of entire circumference
- Saccular: asymmetric out pouching
- Fusiform more common
- Majority of AAA are infrarenal
- Aneurisms can extend into iliacs

Technique

Basics

- Curvilinear probe (best) or phased array
- Start just caudal to xyphoid process
- End caudal to bifurcation (umbilicus)
- Transverse view: probe marker to pt's rt
- Longitudinal view: probe marker to pt's head
- Adjust gain until vessel lumen is black (makes identifying an intra-luminal thrombus easier)
- Always scan in both planes (trans & longitude)

Images

- Identify vertebral body to get oriented
- Vertebral body: horseshoe shaped with hyperechoic anterior & posterior shadowing
- Aorta is anterior & slightly left of vertebral body
- IVC is anterior & right of vertebral body
- Identify the CT, SMA, and bifurcation

Measurements

- Measure in transverse view
- Measure from outer wall to outer wall
- Normal aorta: < 3 cm

Pathology

Dissections

- A dissection looks like a flap in the vessel area
- Flaps are the intima floating out into the vessel
- Watch out for these. They can be subtle!

Aneurisms

- Aneurisms look like a widening of the aorta
- Scan the whole length of the abdominal aorta, so you don't miss one!
- Saccular aneurisms are easier to miss than fusiform, so look for them

General

- Measure from outer walls, otherwise a mural thrombus or plaque may cause you to underestimate diameter
- Transverse views at a slight angle can exaggerate the diameter
- Ectatic aortas are not straight and can take an irregular track through abdomen
- Just because there isn't intraperitoneal fluid doesn't mean there isn't an acute rupture (aortas are retroperitoneal)
- Aorta and IVC can be confused in longitudinal view: aorta is rounder, less compressible, & has brighter thicker walls
- If clinical suspicion for AAA is high & ultrasound is equivocal, get a CT with contrast

Tips and Tricks

- Bowel gas & body habitus can make imaging difficult

Bowel Gas

- Apply steady pressure to move gas
- Jiggle the probe to move bowel aside
- Fan to view through windows in loops of bowel

Obesity

- Have pt lie completely flat
- Flex pt's hips & knees to relax ab muscles
- Lower probe frequency to improve sound wave penetration