Mesenteric Duplex Ultrasound

What could possibly go wrong?

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Mesenteric Duplex Ultrasound
What could possibly go wrong?

No disclosures

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Objective:

Describe common diagnostic pitfalls / problems in vascular abdominal duplex ultrasound examinations –

- Abdominal aortic aneurysms
- Celiac artery
- Superior mesenteric artery
- Renal arteries
- Venous misadventures
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Abdominal aortic aneurysms -
Be certain they are measured accurately

(Xverse: Use harmonic imaging !)
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Abdominal aortic aneurysms -

Fundamental  
Tissue Harmonics
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Abdominal aortic aneurysms –

Measure a true diagonal
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Abdominal aortic aneurysms –

Measure a true diagonal

4.3cm
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Abdominal aortic aneurysms –

30-40% of patients with peripheral aneurysms will also have an aortic aneurysm
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Celiac artery disease - Celiac artery stenosis

Atherosclerotic disease?
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Celiac artery disease –

- >70% stenosis
  - PSV > 200 cm/sec
- Total / near total occlusion
  - Absent flow
- Reversed common hepatic artery flow

Note reversed flow
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Celiac artery disease -
Celiac artery stenosis

Atherosclerotic disease?
Celiac artery compression?
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Celiac artery disease - Celiac artery stenosis

Median arcuate ligament syndrome
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Celiac artery disease - Celiac artery stenosis

Median arcuate ligament syndrome
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Celiac artery disease - Celiac artery stenosis

Median arcuate ligament syndrome
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Celiac artery disease -
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Celiac artery disease - Splenic artery aneurysm

- ~50% Incidental finding
- ~5% present with rupture
- 25 - 40% mortality
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Celiac artery disease - Splenic artery aneurysm

• ~ 50% Incidental finding
• ~ 5% present with rupture
  • 25 - 40% mortality
• Rupture during pregnancy
  • ~ 75% maternal mortality
  • ~ 95% fetal mortality
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Celiac artery disease - Splenic artery aneurysm

- < 2cm safely observe
- Sonographic followup
- Elective repair in young women
- > 2.5cm repair
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Celiac artery disease –

- Absent Doppler flow
- Total / near total occlusion of hepatic artery
- Technically difficult
- Common celiac / SMA trunk
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Superior mesenteric artery disease - Angle correction matters!!
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Superior mesenteric artery disease - Angle correction matters!!
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Superior mesenteric artery disease - Angle correction matters!!

For all mesenteric velocities, be very careful about angle correction.
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Superior mesenteric artery disease - Angle correction matters!!

For all mesenteric velocities, be very careful about angle correction. Avoid areas of sharp curvature (or set angle correction to 0°)
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Renal artery disease –
Instruct the patient -

- Hydrate
- Hydrate
- Hydrate!!
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Renal artery disease -
Angle correction matters!!
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Renal artery disease - Angle correction matters!!

Angulated probe
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Renal artery disease -
Angle correction matters!!
Be familiar with alternate acoustic windows

If at first you don’t succeed, …
move on!!
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Renal artery disease -
Be familiar with alternate acoustic windows
Mesenteric Duplex Ultrasound

Renal artery disease -
Be familiar with alternate acoustic windows
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Renal artery disease - Renal artery stenosis

Atherosclerotic disease?
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Renal artery disease - Renal artery stenosis

Atherosclerotic disease?

PST
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Renal artery disease - Renal artery stenosis

Fibromuscular dysplasia?
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Renal artery disease - Renal artery stenosis

Fibromuscular dysplasia?
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Renal artery disease - Renal artery stenosis

Fibromuscular dysplasia?
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Renal artery disease - Renal artery stenosis

Fibromuscular dysplasia?
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Renal artery disease - Elevated renovascular resistance

Acceleration time used in indirect testing will not likely be a valid measure
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Do not forget the renal vein – (Required for accreditation)
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Stents - Renal

Appropriate diagnostic criteria?

In-stent restenosis criteria:

- Bakker (1999): 226 cm/sec
- Rocha-Singh (2008): 225 cm/sec
- Fleming (2010): 250 cm/sec
- Mohabbat (2009): 280 cm/sec
- Chi (70%, 2009): 395 cm/sec
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Stents - Mesenteric

Appropriate diagnostic criteria?

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Stents - Mesenteric

Appropriate diagnostic criteria?

Abu Rahma et al, J Vasc Surg 2012

Celiac > 363 cm/s
SMA > 412 cm/s
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Abdominal venous problems - Pelvic congestion syndromes

The Nutcracker
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Abdominal venous problems -
Pelvic congestion syndromes

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Abdominal venous problems -
Pelvic congestion syndromes

May-Thurner
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Abdominal venous problems - Pelvic congestion syndromes

The Nutcracker

May-Thurner
Mesenteric Duplex Ultrasound

Abdominal venous problems - Portal hypertension

Valsalva

Release