



Emergency Ultrasound

Abdominal Aortic Aneurysm

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Objectives

- Indications for focussed emergency aortic ultrasound
- Technique
- Images
- Pitfalls

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Indications

- Rule in strategy
- Any patient with suspected abdominal aortic aneurysm
 - Suspected from
 - Suspicious history
 - Clinical examination

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Aortic Anatomy

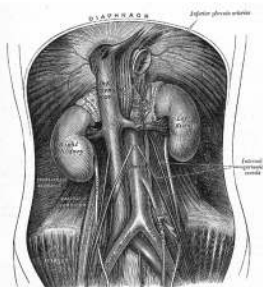
- Left of midline
- IVC to the right
- Tapers
 - External diameter
 - 3cm epigastrium
 - 1.5cm bifurcation
- Diameter measured from outside wall
- Bifurcates just below umbilicus (L4)

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Anatomy

- Coeliac axis 1-2cm below diaphragm
- SMA 2cm below coeliac axis
- IMA 4cm above bifurcation



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Technique

- Lower frequency probe
- 2.5 – 3.5 MHz
- Curvilinear
- Lower frequency – better penetration, definition poorer



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**EMERGENCY
ULTRASOUND**

Technique


- Supine patient
- Examine in two planes
 - Transverse
 - Longitudinal

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Transverse

- Looking at patient from their feet
- Probe marker to the right of the patient = liver to left of screen
- Start just below xiphoid
- Left lobe liver – acoustic window



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**EMERGENCY
ULTRASOUND**


Transverse

- Pressure to displace bowel
- Identify aorta at diaphragm
- Identify liver, IVC and spinal column
- Aorta / IVC = anechoic
- Spine = hypoechoic

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**EMERGENCY
ULTRASOUND**

Transverse image



**EMERGENCY
ULTRASOUND**

Transverse image



**EMERGENCY
ULTRASOUND**

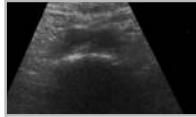
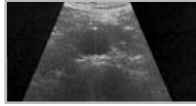
| | |
|---|---|
| <h3>IVC</h3> <ul style="list-style-type: none"> ■ RIGHT SIDE ■ THIN WALLED ■ COMPRESSIBLE ■ TRANSMITTED PULSATILITY ■ ALMOND ■ VARIES | <h3>AORTA</h3> <ul style="list-style-type: none"> ■ LEFT SIDE ■ THICK WALLED ■ WILL NOT COMPRESS ■ PULSATILE ■ ROUND ■ CONSTANT SHAPE ■ SMA DEMONSTRATED |
|---|---|

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Transverse image



- Follow aorta to bifurcation
- Measure diameter every 3-4cm
- Measure diameter
 - Subxiphoid
 - Midway (SMA origin)
 - Bifurcation



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Longitudinal (sagittal)

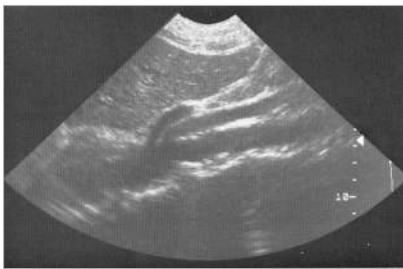


- Marker point to head
- Left of midline
- Start epigastrium



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Normal longitudinal image

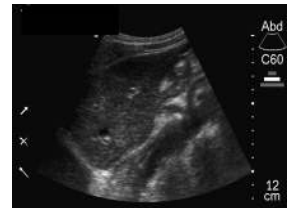


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Longitudinal



- Identify SMA
- Measure at 3-4 cm intervals to bifurcation

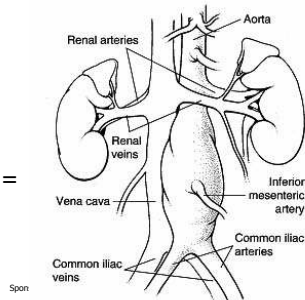


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Anatomy of aneurysms



- 90% AAA infra-renal
- 95% Fusiform
- > 3cm diameter = AAA



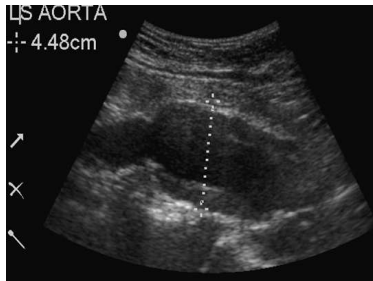
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Transverse image AAA



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Longitudinal image AAA



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Pitfalls – unable to obtain image



- Overlying bowel gas / pneumoperitoneum
- Patient in pain

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Pitfalls



- Identify IVC not aorta
- Not measure external diameter
- Inaccurate measurement overestimate or underestimate aortic diameter / tortuous aorta

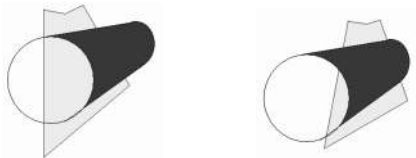
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Transverse inaccurate measurement



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Longitudinal inaccurate measurement



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Pitfalls



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Pitfalls



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ANY QUESTIONS ?



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Summary



- Rule in strategy
- Transverse and longitudinal views
- Identification of the aorta
- Measurement
- Pitfalls

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