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Screening of Abdominal Aortic Aneurysms

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ULTRASOUND CT MRI X-RAY SERVICES

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Viamo
performance to go

INTRODUCTION

There has been much interest in screening abdominal aortic aneurysms (AAA), where studies indicate a prevalence of 5% to 10% in men aged 65 to 79 years. The major complication is rupture which is a surgical emergency and has a high risk of mortality: 80% for patients reaching hospital and 50% for those undergoing surgery for emergency repair.

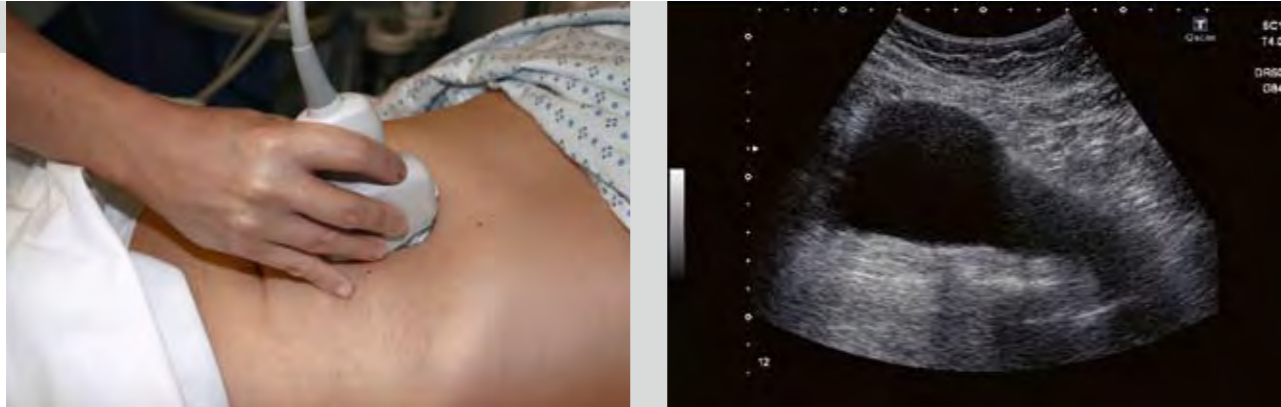
Many studies have therefore been carried out to assess the true benefits of population-based screening to detect, monitor and repair abdominal aortic aneurysms before rupture. Currently elective surgical repair is recommended for aneurysms discovered to be larger than 5.5 cm to prevent rupture.

In a recent metanalysis of four randomised controlled trials for screening AAA, studies involving 127,891 men and 9342 women showed a significant decrease in mortality and of ruptured aneurysms in men but not women. It was thus concluded that a screening program for men was cost effective and was more so with time over a ten-year period but remained unproven for the female population.

EQUIPMENT AND TECHNIQUE

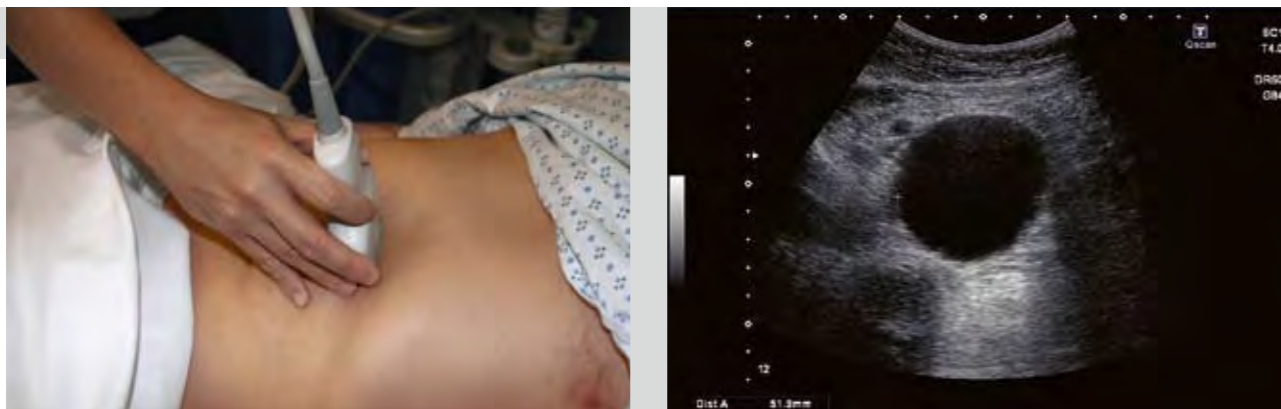
Ultrasound is an easy and non-invasive technique for assessing the abdominal aorta. The advancement and high quality of portable ultrasound systems, such as the Viamo by Toshiba Medical Systems, lends itself to screening a population in the community. Its manoeuvrability also enables quick bed-side assessment of patients with suspected leaking AAA in an emergency setting.

Figs. 1



The patient is scanned supine and the probe is placed in longitudinal scan (LS) starting at the epigastrium and is traced to the bifurcation (Fig. 1). The presence of overlying bowel gas may require gentle compression to completely visualise the length of the aorta. An AAA may be classified as saccular or fusiform and it is also important to know if the iliac arteries are involved.

Figs. 2



The probe is then turned into the transverse plane (TS) (Fig.2) and if possible, the location of the aneurysm below or above the renal arteries is determined. The maximal diameter of the aneurysm is also measured and an estimate of the amount of thrombus is also made with the aid of colour Doppler assessment.

A step-by-step guide is provided below:

1. Ensure patient is comfortable in supine position
2. Probe in LS starting at epigastrium and scanning to just below the umbilicus
3. Assess the entire AA and proximal iliac vessels
4. Gentle compression and remember not to push too hard if an AAA is present as this may induce a leak.
5. Turn probe TS, again scanning from the epigastrium down towards the bifurcation of the aorta
6. Determine relation to renal vessels but this may not always be possible. If a AAA is detected the patient will need to undergo a CT angiogram particularly if surgery is to be considered.
7. Turn on colour Doppler and assess lumen size and thickness of intima.

Fig. 3



Fig. 4



Fig. 5



Fig. 3 shows a longitudinal scan of a patient with a saccular AAA measuring 5 cm. Note that the iliac vessels are non aneurysmal. Fig. 4 shows the maximal diameter of this aneurysm in TS, and the colour Doppler image in fig. 5 shows the true lumen size and the relative thickness of the intima.

CONCLUSION

Screening programs for men aged 65 and over have been introduced in the United Kingdom owing to the strong evidence of cost and mortality benefit demonstrated by several randomised controlled studies. Ultrasound remains the imaging modality of choice for screening AAA and the availability of high-quality portable ultrasound systems allows good assessment, not only in the emergency setting but within the general community and polyclinics.

A step-by-step guide of how to scan the aorta has been provided.