

Palpating for abdominal aortic aneurysms within a specialist podiatrist and nurse-led peripheral arterial disease service: A pulse too far?

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Abdominal aortic aneurysm (AAA) detection may not spring to mind as a priority for Clinicians working primarily with diabetic foot disease and it is certainly not common practice for such clinicians to be actively looking out for them. However as specialist podiatrist and nurse-led peripheral arterial disease (PAD) services emerge in the NHS (working closely with existing vascular and diabetic foot teams), the theme of opportunistic palpation of the abdomen for AAAs during the PAD assessment now requires some consideration.

Deaths from AAA

AAA may be defined as a permanent and irreversible localised dilation of a vessel; in this case the vessel being the aorta as it passes through the abdomen. AAA, if undetected and untreated, can rupture suddenly and has accounted for around 8000 deaths per year in the UK (Sakalihan et al, 2005). Mortality from ruptured AAA can be as high as 90% (Prance et al, 1999) and about one third of undetected and untreated AAA will go on to rupture (Fleming et al, 2005). Conversely, in people who have been screened, found to have AAA and offered elective repairs, the total mortality for elective repairs and AAA ruptures is 3% (National Abdominal Aortic Aneurysm Screening Programme [NAAASP], 2013).

Risk factors for AAA

AAA occurs predominantly in men >65 years of age with a history of smoking and hypertension. Family history also increases the likelihood of AAA. Although approximately 6-times more prevalent in men than women, women >65 years of age with a history of smoking or heart disease are also at increased risk of AAA (DeRubertis et al, 2007). Women also have a 4-fold higher risk of rupture from AAA, compared with men (Norman and Powell, 2007).

Interestingly, in people with diabetes, a negative association with AAA has been reported in various studies, along with slower AAA enlargement and fewer rupture repairs (Lederle, 2012). Although the reasons are not yet fully understood, it has been suggested that the advanced glycation associated with diabetes can induce cross-linking of collagen lattices in the aortic media, ultimately reducing aortic wall degradation and stress, which is considered fundamental to AAA formation and progression (Lederle, 2012).

The NHS' National AAA Screening Programme

Analysis of a large, multicentre AAA screening study has shown that screening will significantly reduce the overall number of deaths from ruptured AAA, even when taking into account the post operative deaths following elective surgical repair intervention. This has led to the development of the NAASP (www.aaa.screening.nhs.uk). The need to improve AAA outcomes has also been a major driver of the current centralisation of NHS vascular surgical units in the UK (Holt et al, 2007).

The overwhelming majority of ruptured aneurysms occur in men over 65. This has driven the development of the NHS AAA screening programme, which aims to reduce deaths from ruptured AAA by up to 50%. The programme invites all men for a one off ultrasound examination of the abdomen in the year they turn 65. The ultrasound examination is done by a trained AAA technician, takes about 10 minutes and is highly sensitive and specific for detecting both the presence of and size of AAA. The possible outcomes from the screening are summarised in *Table 1*.

During 2011–12, around 93% of all men aged 65 years were offered an AAA screen and overall, 75% (107 000) invited men attended, which resulted in 1600 aneurysms being found. There

Table 1. Listed here are the four possible outcomes of abdominal aortic aneurysm (AAA) screening in men, depending on the diameter of the abdominal aorta. [Adapted from www.aaa.screening.co.uk]

Classification	Size (cm)	Action
Normal	<3	Discharged
Small	3–4.4	Invited back for annual scan
Medium	4.5–5.4	Invited back for 3 monthly scans
Large	≥5.5	Referred directly to a surgeon

were 190 elective AAA repairs and three related postoperative deaths (NAAASP, 2013).

Detecting AAA by palpating the abdomen

Palpation of the abdomen for an excessively pulsatile abdominal aorta is part of the normal clinical vascular assessment in many vascular clinics and has previously been recommended as part of the periodic health examination of older men (Oboler and Laforce, 1989). It is known to be only moderately sensitive in detecting AAA, but appears to be highly sensitive in people with a large AAA, if they do not have a large girth (Fink et al, 2000). Abdominal palpation is taught as part of undergraduate medical programmes and has been included in the training and examination of advanced practitioners (nurses or allied health professionals). A 10-minute training session for AAA palpation and interpretation, is detailed in the study by Fink et al (2000). The same author has suggested that any definitive or suggestive findings for AAA on physical examination should have the diagnosis confirmed by appropriate imaging, such as ultrasound.

Other clinical indicators of AAA

Most patients with AAA are asymptomatic. Outside of the national AAA Screening Programme, AAA is usually found incidentally, in patients who have undergone imaging or investigations for other reasons. Where symptoms are present, along with a pulsatile abdomen, they can involve back, abdominal or groin pain, sometimes with distal embolisation or more rarely acute thrombosis (Sakalihasan et al, 2005).

Palpating for AAA during PAD assessment

Although PAD is not a key risk factor for AAA,

the prevalence of AAA in people with PAD has been found to be much higher (up to 13%) than in the general population (Barba et al, 2005). In the SIGN (2006) guidelines for PAD, it is specifically recommended that, "individuals with a history of intermittent claudication should have an examination of peripheral pulses and palpation of the abdomen for an aortic aneurysm". This guidance is aimed at clinicians assessing and diagnosing PAD in primary care settings.

Clinical PAD assessment should include palpation of foot, popliteal and femoral pulses along with ankle-brachial pressure index (NICE, 2012). It is common practice in vascular clinics to also palpate the abdomen for the possibility of AAA, while the patient is lying down. Palpation of the abdomen opportunistically for detection of potential undiagnosed AAA has recently been included in the peripheral vascular disease (PVD) competency dimension for advanced podiatrists (McCardle and Fox, 2013). It has been suggested that this competency is considered in line with local vascular team preference.

During broad multidisciplinary consultation on the draft PVD competency dimension, palpation of the abdomen for AAA caused the most debate and identified a split in professional clinical opinion on whether it should be included or not. Concerns raised were around:

- The lack of direct association between AAA and PAD.
- Diagnostic accuracy of abdominal palpation.
- The potential for false positive and false negative results.
- Causing unnecessary worry in patients.
- Consenting patients adequately.
- Variability of verbal messages given during and following palpation.

The decision to include abdominal palpation in the published PVD competency dimension stemmed from the SIGN Guidelines recommendations for PAD (SIGN, 2006) and from experiences of clinicians piloting abdominal palpation. It has been piloted within a specialist podiatry and nurse-led PAD service (Fox et al, 2012) and by a principal podiatrist working in a neighbouring NHS Trust, who had undergone advanced practitioner training and mentorship from her vascular team colleagues (Chaudhry, 2013).

The results of opportunistic abdominal palpation and the subsequent detection rate of AAA in people presenting for lower limb PAD assessment to these services are summarised in *Table 2*, alongside the recently published NAAASP statistics. It is also of note that in the Manchester PAD service, of the approximately 250 people checked, a total of 17 were referred on due to excessively pulsatile aortas and of these 8 were subsequently confirmed to have AAA via Duplex imaging.

Cases identified initially by abdominal palpation

The following case studies are taken from patients who have attended the podiatrist and nurse-led PAD service in Manchester.

Case study 1

A 68-year-old man attended for a PAD assessment in January 2012. He was found to have mild PAD and was referred to his GP for medicines review and to a supervised exercise programme. His abdomen was not palpated opportunistically. In July 2012 at his PAD review, he was found to have stable PAD. At this appointment his abdomen was palpated opportunistically for AAA. He was found to have a pulsatile, expansile abdominal aorta. He had no abdominal, lower back or groin symptoms and was otherwise well. He was referred to his GP, for consideration of further vascular opinion. A vascular surgeon saw him approximately 4 months later, in November 2012. The AAA was confirmed by Duplex scan and found to be large. In December 2012, he underwent an elective endovascular aneurysm repair. In April 2013, he was reviewed, had healed uneventfully, his walking distances had improved and he was well.

This case was highlighted in a national newspaper to raise awareness around AAAs and PAD. He was quoted as saying, "My surgeon told me the aneurysm was over 10.5 cm. I needed surgery straightaway. If it hadn't been investigated I don't think I'd be here today. I'm horrified when I look back and realise how much danger I was in and didn't even know it."

Case study 2

A 73-year-old man was seen on 24 December 2013 for PAD assessment, due to vague leg symptoms. He had no abdominal, lower back or groin symptoms and was otherwise well. He was found to have normal arterial flow in the legs. His abdomen was palpated opportunistically during PAD assessment and his aorta was found to be pulsatile and expansile. He was referred directly for an urgent outpatient vascular appointment. In early January 2014 he was seen by the surgeon, who confirmed an AAA 7.4 cm in diameter. His options were discussed and he chose to proceed with elective surgery.

Discussion

Although the NAAASP has had a major impact on the detection of life threatening aortic aneurysms, there are a significant proportion of the target population who do not attend for screening (>25%) and there are other people likely to have AAA (e.g. men aged >65 years and women with a history of smoking or heart disease) who are not eligible for this programme. For people with undetected AAA who are not screened, incidental detection (e.g. during computed tomography scan / X-ray) or reporting family history of AAA to the GP may lead to the detection of AAAs.

Table 2. Abdominal aortic aneurysm (AAA) detection from the National AAA Screening Programme (NAAASP) and from opportunistic palpation during specialist nurse-led and / or podiatrist-led peripheral arterial disease (PAD) services in Manchester (Fox et al, 2012) and Stockport (Chaudhry, 2013).

Service	NAAASP	Podiatrist and nurse-led PAD service (Manchester)	Podiatry-led PAD assessment (Stockport)
Year	2011–12	2011–12	2012–13
Population	107 000 men screened	~250 people palpated	576 people palpated
AAAs confirmed	1600	8	12
Elective endovascular aneurysm repair (<i>n</i>)	190	2	Not reported
Detection rate (%)	1.5	~3.2	2.1

"If death from undetected and untreated ruptured abdominal aortic aneurysm in the at-risk population is to be minimised, opportunistic abdominal palpation in people attending for peripheral arterial disease assessment needs to be considered."

Opportunistic abdominal palpation as part of a clinical examination is perhaps the only other common trigger for diagnostic AAA investigations (Fink et al, 2000).

In specialist podiatrist and nurse-led PAD assessment services, opportunistic palpation of abdomens for AAA has resulted in detection rates that compare well to the detection rates for people attending the national screening programme. We have not found any published data to compare our AAA detection rates in Manchester and Stockport with other vascular clinics, where opportunistically abdominal palpation commonly takes place. Previously undetected and untreated aneurysms have been found in people attending our clinics, including large ones that have required urgent surgical repair.

As vascular service reconfiguration and redesign occurs throughout the NHS with centralisation of vascular surgery in "hub" centres, it is likely that more specialist podiatrist and nurse-led PAD services will be provided in "spoke" settings; either outlying hospitals, primary care centres, or diabetic foot clinics. There is an opportunity for all such PAD assessment clinics to consider including abdominal palpation as part of the overall clinical assessment.

Patients lying flat for an ankle-brachial pressure index assessment are in an ideal position for this quick, simple non-invasive and moderately sensitive AAA examination technique. The issues of concern around abdominal palpation raised above, can all be dealt with within a reasonable clinical governance framework. A suggested route for specialist podiatrist and nurses to acquire vascular competencies and demonstrate clinical governance has been put forward previously and is summarised below (Fox, 2013):

1. Identify current vascular competencies, using the PVD competency dimension.
2. Complete a post-graduate Level 6 / 7 vascular disease module (e.g. Edge Hill University).
3. Undergo a supervised 6-month placement in a vascular clinic, with a vascular surgeon mentor, to develop vascular diagnostic and clinical management experience (e.g. 50 hours in total).

Conclusion

If death from undetected and untreated ruptured AAA in the at-risk population is to be minimised, opportunistic abdominal palpation

in people attending for PAD assessment needs to be considered, to supplement the national AAA screening programme. This quick, simple clinical test would identify life-threatening AAA in people who are not eligible for or do not attend the AAA screening programme.

An integrated approach from the vascular clinical community on this issue is essential and any clinicians palpating for abdominal aneurysms will need to be adequately trained within vascular clinics. Specialist podiatrists and nurses who are already providing PAD assessment as part of diabetic or high-risk foot services will need to discuss this with their local consultant vascular surgeons. ■

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