

SHORT REPORT

Peripheral Vascular Disease in an Individual with Pseudoxanthoma Elasticum

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Background

Pseudoxanthoma elasticum (PXE) is an inherited connective tissue disorder that affects some parts of the body. The incidence has been documented as varying between 1:200 000 to 1:25 000, although there may be many individuals who are not diagnosed due to sub clinical/atypical signs. It is autosomally inherited and has been attributed to mutations in the ABCC6 gene located on chromosome 16p13.1¹ and 43 mutations have been identified to date.²

This is a case report of a 33-year-old lady with PXE who developed peripheral arterial disease (PAD) with no other identifiable risk factors.

Case Report

This 33-year-old lady was referred to the Sheffield Vascular Institute with a two-year history of progressively increasing calf pain on walking shorter distances. The only past medical history of note was a diagnosis of pseudoxanthoma elasticum (PXE), which was diagnosed when she was 15-years-old by her optician, who noted angioid retinal streaks.

She had no identifiable risk factors for peripheral vascular disease: lipid levels and homocysteine levels were normal.

On examination, she had palpable peripheral pulses but her ABPI's were significantly diminished (0.75 bilaterally). An MRA demonstrated a 40–50%

stenosis in the right superficial femoral artery and a 50–60% stenosis in the left superficial femoral artery (Fig. 1). There was also significant distal disease of all tibial and peroneal arteries bilaterally.

Unfortunately, the patient was unable to take statins due to side effects, predominantly lethargy, and aspirin due to an increased risk of GI bleeding, therefore, limiting management options.



Fig. 1. Lower Limb MRA.

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Discussion

Unfortunately there is limited information of PAD associated with PXE. The majority of information available for PXE related arteriopathies is described in relation to cardiothoracic procedures. There have been many cases that have highlighted the need for individuals undergoing bypass grafting, and potentially having PXE to undergo arterial studies prior to surgery.^{3–5}

Occlusive peripheral vascular disease relating to connective tissue disorders is rarely discussed in the literature. Wahlqvist *et al.*, described the phenomena of intermittent claudication as a presenting feature of PXE in two relatively young males.⁶ Their analysis recommended that in the management of a young patient with intermittent claudication, with no other identifiable risk factors, it might be advisable to use fluorescein angiography to demonstrate otherwise undetectable angioid streaks.

Skin biopsies taken from individuals with PXE have demonstrated elastic fibre fragmentation and calcium and proteoglycans accumulation, and these changes were demonstrated in arteries by Kornet *et al.* 2004.⁷ Proteoglycans organise the extracellular matrix by acting as signalling molecules, and are subsequently involved in cell migration and proliferation. Germain *et al.*, analysed carotid artery and radial artery diameter of 27 individuals with PXE, to determine the intima media thickness and vessel distensibility. Patients with PXE had a significantly higher IMT ($p < 0.001$) compared to controls.⁸

Microvascular changes are also described in the literature. In 2004, Perdu *et al.*, demonstrated microangiopathy, characterised by normal capillary density, frequent capillary oedema and a slowing down of capillary blood flow i.e. sludge phenomenon.⁹

The management of individuals with PAD attributed to PXE is difficult because it seems that their vascular disease can not be controlled by lifestyle changes and medication. Revascularisation in claudication is contraindicated because of the diffuse and

distal nature of the vascular disease. However, in cases of critical ischaemia, a thorough peripheral vascular evaluation must be performed and revascularisation should be attempted even with the poor nature of the disease.

It must also be brought to the attention of individuals, that due to the autosomal inheritance of the condition, a thorough family history must be undertaken and potential arterial disease risks of the condition explained to the patient.

References

- 1 PAVLOVIC AM, ZIDVERC-TRAJKOVIC J, MILOVIC MM, PAVLOVIC DM, JOVANOVIC Z, MIJAJLOVIC M *et al.* Cerebral small vessel disease in pseudoxanthoma elasticum: three cases. *Can J Neurol Sci* 2005; **32**(1):115–118.
- 2 OHTANI T, FURUKAWA F. Pseudoxanthoma elasticum. *J Dermatol* 2002; **29**(10):615–620.
- 3 LODGE AJ, DODD LG, LOWE JE. Arterial conduits should be evaluated preoperatively in coronary artery bypass patients with pseudoxanthoma elasticum. *Tex Heart Inst J* 2005; **32**(4):576–578.
- 4 SONG HK, SHARONI E, WILLIAMS Jr B, GUYTON RA, PUSKAS JD. Long term left internal mammary artery graft patency for coronary artery disease associated with pseudoxanthoma elasticum. *Ann Thorac Surg* 2004; **78**(2):691–693.
- 5 ILIOPOULOS J, MANGANAS C, JEPSON N, NEWMAN DC. Pseudoxanthoma elasticum: is the left internal mammary artery a suitable conduit for coronary artery bypass grafting. *Ann Thorac Surg* 2002; **73**(2):652–653.
- 6 WAHLQVIST ML, FOX RM, BEECH AM, FAVILLA I. Peripheral vascular disease as a mode of presentation of pseudoxanthoma elasticum. *Aust N Z J Med* 1977; **7**(5):523–525.
- 7 KORNET L, BERGEN AA, HOEKS AP, CLEUTJENS JP, OOSTRA RJ, DAEMEN MJ *et al.* In patients with pseudoxanthoma elasticum a thicker and more elastic carotid artery is associated with elastin fragmentation and proteoglycans accumulation. *Ultrasound Med Biol* 2004; **30**(8):1041–1048.
- 8 GERMAIN DP, BOUTOUYRIE P, LALOUX B, LAURENT S. Arterial remodeling and stiffness in patients with pseudoxanthoma elasticum. *Arterioscler Thromb Vasc Biol* 2003; **23**(5):836–841.
- 9 PERDU J, CHAMPION K, EMMERICH J, FIESSINGER JN. Microvascular involvement in pseudoxanthoma elasticum. Capillaroscopic findings. *Presse Med* 2004; **33**(8):518–521.

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