

Findings that shed new light on the possible pathogenesis of a disease or an adverse effect

# Atypical mycobacteria in a superficial femoral artery occlusion

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## Summary

There is indirect evidence that atherosclerosis may occur in association with bacterial infection. The authors report the case of a young woman who presented with right calf claudication caused by a short occlusion of the superficial femoral artery. Histological examination of the excised segment of artery revealed atheroma and atypical mycobacteria within adventitial caseating granulomata. The possible causes are discussed.

## BACKGROUND

This is the first proven case of mycobacteria infecting atherosclerotic artery.

## CASE PRESENTATION

A 42-year-old woman presented with right calf claudication at 200 m, which resolved on resting. She was an occasional smoker, was non-diabetic and had no family history of arterial disease. Five years previously she had sustained a ligamentous injury to her right knee which had eventually been treated by physiotherapy. Right sided pulses were absent beyond a normal femoral pulse. The ankle-brachial pressure index of the left leg was 1.0 and the right leg 0.6.

## INVESTIGATIONS

A duplex ultrasound scan identified a 3 cm long occlusion in the adductor segment of the superficial femoral artery (SFA) with three vessel run-off, and no other lesions elsewhere. Magnetic resonance angiogram confirmed the ultrasound appearance in the right leg and normal arteries in the left. Her random cholesterol was measured at that stage and found to be 9 mmol/l.

## TREATMENT

Three months later, her walking distance had diminished so a bypass of the occluded segment was planned, rather than angioplasty, which was considered to offer a lesser chance of long-term success. At operation, the occluded segment of SFA at the level of the adductor hiatus was unusually dilated and hard, but with macroscopically normal vessel proximal and distal to this. Because of the unusual appearance, and the bulk of a lesion in a cramped anatomical site, it was decided to remove the diseased segment to make room for an interposition graft of autologous long saphenous vein taken from the ipsilateral upper thigh.

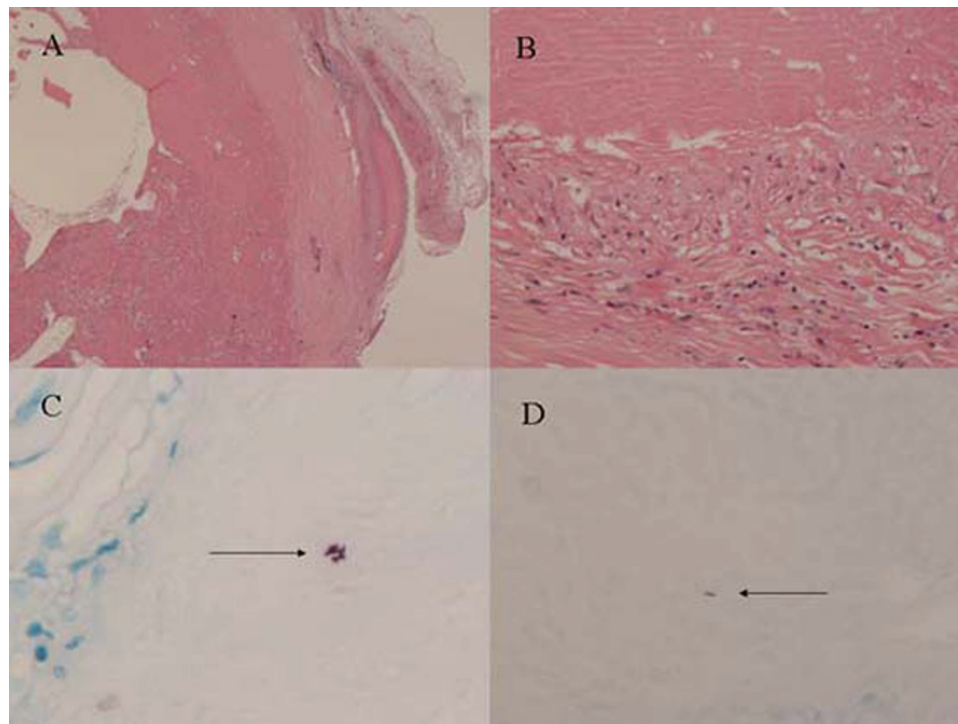
## OUTCOME AND FOLLOW-UP

The postoperative recovery was uncomplicated and subsequent graft surveillance has been satisfactory. The resected artery was sent for histological examination. This confirmed the presence of atheroma with recanalisation of the vessel. In addition caseating granulomatous inflammation in the adventitia was noted and mycobacteria, positive with Wade Fite staining, and negative with Ziehl-Neelsen staining were seen (figure 1). Subsequent tuberculin testing was strongly positive but the Quantiferon TB gold test was negative, implying the strongly positive tuberculin skin test was due to environmental mycobacteria infection. The patient was commenced on a statin postoperatively. A presumptive diagnosis of infection with an atypical environmental mycobacterium has been made and treatment commenced with rifampicin, ethambutol and clarithromycin for 24 months.

## DISCUSSION

The finding of mycobacteria apparently infecting an atheromatous segment of artery has not previously been reported. The finding in this case was serendipitous because the occluded arterial segment is not usually removed, nor sent for histological examination during surgical revascularisation. It is unclear whether the presence of mycobacteria in this vessel was a primary or a secondary event. The patient had hypercholesterolaemia, and had a history of trauma to the knee, so these could have combined to accelerate atherosclerotic degeneration at a site known to be vulnerable to atherosclerotic disease. However she is young, with a history of only occasional cigarette consumption and from a high socioeconomic group.

The evidence for mycobacterial involvement in atherosclerosis relates to heat shock proteins (HSPs),<sup>1</sup> present in healthy individuals to protect polypeptide synthesis and repair proteins that have become denatured.<sup>2</sup> HSP60 has now been found in serum and is also expressed on cell surfaces.<sup>3</sup> It has been postulated that homology between



**Figure 1** (A) Area of granulomatous inflammation with caseation (H&E  $\times 2$  magnification), (B) Area of granulomatous inflammation with caseation (H&E  $\times 20$  magnification), (C, D) Wade Fite staining showing atypical mycobacteria (arrowed) ( $\times 60$  magnification).

human and bacterial HSPs allows antibodies produced in response to bacterial infection to cross-react with the human HSPs on endothelial cells, provoking an inflammatory reaction and early atherosclerosis.<sup>4-6</sup>

HSP60 has been identified as localising to atherosclerotic lesions in arterial wall, HSP70 in inflammatory cells in advanced atherosclerotic disease.<sup>7</sup> Anti-HSP65 antibodies have been found in patients with carotid plaque<sup>8</sup> and titre levels of anti-HSP65 have been correlated to the severity of carotid lesions.<sup>9</sup> A correlation has been reported too between anti-HSP60 antibodies and anti-*Chlamydia pneumoniae* antibodies.<sup>10</sup>

### Learning points

- The finding of atypical mycobacteria in an isolated area of atheroma may or may not indicate a role of HSPs; however, it does raise the issue of whether biopsy of atherosclerotic lesions should accompany revascularisation more frequently.

**Competing interests** None.

**Patient consent** Obtained.

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