

lesson of the month (2)

An unique presentation of infective endocarditis

This lesson reports the case of endophthalmitis, a rare presentation of infective endocarditis (IE), two months following cardiac surgery. Although inflammatory markers were increased, blood cultures were negative. Transoesophageal echocardiography demonstrated an aortic root abscess. Culture of tissue obtained at surgery revealed the infective organism to be *Aspergillus fumigatus*, a rare cause of IE in the immunocompetent patient.

Lesson

A 73-year-old man underwent tissue aortic valve replacement (AVR). Despite initial uncomplicated recovery, one-month post-operatively he reported reduced right-sided visual acuity. Ophthalmological examination suggested a diagnosis of unilateral endophthalmitis. On examination he was pyrexial (38°C) and had aortic regurgitation (AR) but no other signs of endocarditis. Investigation revealed normocytic normochromic anaemia (haemoglobin 9.5 g/l), white cell count $9 \times 10^9/l$, C-reactive protein 71 mg/l. Six blood cultures were negative at five days, as were vitreous cultures. Atypical respiratory serology and antistaphylococcal antibodies were negative. Transoesophageal echocardiography demonstrated an aortic root abscess posteriorly (Fig 1). The prosthetic AV was 'rocking' with moderate AR.

A diagnosis of infective endocarditis (IE) with secondary endophthalmitis was made and treatment commenced with intravenous vancomycin, gentamicin and rifampicin, intra-vitreous cefazidime, topical chloramphenicol and oral prednisolone. His case was discussed with the cardiothoracic surgery team and it was agreed that, in the absence of cardiac compromise, surgery should be delayed until he had received a prolonged course of antibiotics. One week later he developed left-sided endophthalmitis. Intravenous variconazole was added to cover for fungal endophthalmitis. In view of ongoing infection, he underwent redo-AV surgery. At surgery, large vegetations were seen on the partially dehiscent bioprosthetic valve with a gross sub-annular root abscess extending into the left ventricular outflow tract. The patient underwent aortic root replacement and bioprosthetic AVR. Samples of the explanted valve grew *Aspergillus fumigatus* and intravenous amphotericin was commenced. Two days postoperatively the patient's condition deteriorated suddenly with the

development of intracerebral haemorrhage, followed by multi-organ failure and he died the following day.

Discussion

Fungal endocarditis is rare, accounting for 1.3% of all cases of endocarditis and affecting only 0.1% of all prosthetic valves. The most common organism isolated is *Candida*, with *Aspergillus* cultured in 25% of cases.¹ *Aspergillus* typically affects the immunocompromised but rarely affects immunocompetent patients. Additional predisposing factors include prior valve surgery, diabetes, malignancy, in-dwelling intravascular catheters, broad-spectrum antibiotics and intravenous drug abuse.² The diagnosis is often delayed³ due to paucity of peripheral signs of IE and a lack of consistent or pathognomonic features. The common features include fever and peripheral emboli

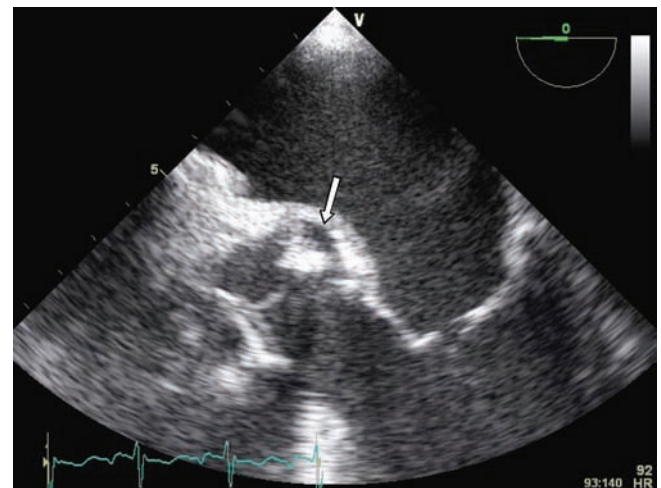


Fig 1. Transoesophageal echocardiography demonstrating an aortic root abscess posterior to the prosthetic aortic valve.

Key learning points

- *Aspergillus* endocarditis is an ominous complication after cardiac surgery and confers a poor prognosis.
- The diagnosis of fungal endocarditis is difficult, leading to delays in treatment, but should always be considered in 'culture-negative' endocarditis, especially in patients with prosthetic cardiac valves.
- Patients with pyrexia of unknown origin following valve replacement should undergo transthoracic echocardiography (TTE) and transoesophageal echocardiography (TOE), and several sets of blood cultures.
- Endophthalmitis is a rare but recognised complication of endocarditis.

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(seen in 83% of patients) involving all major organs and associated with aneurysm formation. Blood cultures are generally negative with positive cultures in only 31% of *Aspergillus* cases.² Often the diagnosis is made at surgery. The prognosis is poor with a high rate of recurrence and survival rate of only 18%.²

Ocular manifestations are seen in fungal endocarditis in approximately 13% of cases, but *Aspergillus* endophthalmitis secondary to endocarditis is extremely rare.⁴ Treatment is with systemic and intra-vitreous antibiotics and, in severe cases, vitrectomy.

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letters to the editor

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Misdiagnosis: analysis based on case record review with proposals aimed to improve diagnostic processes

Editor – Neale and colleagues provide a valuable reminder that misdiagnosis is commonly related to cognitive errors (*Clin Med* August 2011 pp 317–21). They encourage a shift in emphasis from intuitive (system 1) to analytical (system 2) thinking because 'over-reliance on a simple perceptive approach to diagnosis may forestall analysis'. However, general strategies for correcting cognitive biases can be problematic. Croskerry¹ advises against viewing the two systems separately and has promoted a combined approach, emphasising the complexity of decision making in practice. Norman and Eva² have drawn attention to biases inherent in the analysis of errors. They note that similar errors are attributable to several mechanisms but cite some gains from combining the analytic and intuitive. They suggest that simple prompting strategies may be better than formal teaching about cognitive biases. Thus, to avoid the common bias of premature clo-

sure, 'think of the first thing that comes to mind but think of other possibilities'. Some studies provide evidence that teaching more analytical reasoning may sometimes, paradoxically, worsen results.³ Norman and Eva reference a similar point.² None of this, of course, negates the need for analytic thought in context.

We have recently proposed that memorable aphorisms can still be valuable aids to judgement.⁴ While such heuristics (short cuts) have come in for criticism they are not inherently bad (or good) but must be applied in context and reviewed critically. Neale and colleagues seem to be thinking along these lines where they say 'To remind clinicians not to ignore the pelvis perhaps the term 'PR (per rectum)' might be replaced by 'RPE' (rectal and pelvic examination)'. Could this be ripe for an aphorism? This important point about terminology influencing behaviour deserves more study. One of us has observed that the ubiquitous use of abbreviations such as ACS or TIA can cause diagnostic error by turning a verbal short cut into thought cut short.⁵ Few would argue with their sugges-

tion for structural prompts in records. Too often 'clerking' is seen as an end in itself. Physicians will support their call for reflection, resisting speed of throughput at the expense of time for thought.

The authors treat the unfolding case as a series of links in a chain, noting error at various points. However, the linear chain is not always a good model for healthcare. Working with patients is a complex system involving uncertainty and unfolding over time. Within such a system, decisions require a wider process of sensemaking and situation awareness that must include networks of persons, as indeed the authors suggest in their recommendation for more consultation. Encouraging doctors (and others) to challenge diagnoses and voice uncertainty is essential, and inculcating these behaviours and collaborative work habits should start in medical school.

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