Rare disease

Native valve infective endocarditis due to *Achromobacter xylosoxidans* in an apparently immunocompetent individual

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Summary

A 79-year-old woman presented with fever, lethargy and weight loss. Clinically, the patient was confused, frail and had a systolic murmur. Her temperature was 38 °C and she remained persistently febrile. Initial investigations revealed neutrophilia with an elevated C reactive protein level. Multiple peripheral blood cultures grew *Achromobacter xylosoxidans*, a Gram-negative rod, which is a very rare cause of infection in patients who are immunocompetent. Subsequent transoesophageal echocardiography confirmed endocarditis with obvious vegetations on the mitral valve. The patient was treated with intravenous meropenem and cotrimoxazole in line with microbiology guidance. Surgical intervention in the form of mitral valve replacement was considered, but the patient was felt to be at prohibitive risk.

After 6 weeks of intravenous antibiotics, a repeat transoesophageal echocardiogram showed no improvement in the mitral valve vegetation, which had increased in size. At this stage, her clinical course was complicated by major upper gastrointestinal bleeding requiring transfusion, multiorgan failure and ultimately death.

BACKGROUND

Achromobacter xylosoxidans is a rare cause of bacteraemia and is usually only seen in patients who are immunocompromised. *A xylosoxidans* infections should be managed with a team approach involving clinical microbiologists, cardiologists, surgeons, and so on. *A xylosoxidans* is known to be a cause of prosthetic valve endocarditis but is very rarely found in those with native valves. *A xylosoxidans* is a difficult organism to eradicate, often resistant to antibiotics. In cases of endocarditis, surgical intervention should be considered early if the patient is clinically fit.

CASE PRESENTATION

A 79-year-old woman presented with a 2-week history of fever, lethargy and weight loss. The patient had become increasing unwell, with fever and signs of acute delirium. The patient had a background of atrial fibrillation, transient ischaemic attacks and hypertension. The patient was otherwise well and independent with regard to daily living activities. The patient took only antihypertensive medications, simvastatin and warfarin.

On examination, the patient was confused and disoriented with regard to time and location.

Her temperature was raised at 38 °C. Heart rate, blood pressure and oxygen saturations were within normal limits. Examination of the cardiovascular, respiratory and abdominal systems did not reveal any obvious abnormality. There were no neurological findings apart from the new onset of confusion.

The right knee was swollen and tender but with a normal range of movement. There was a small ulcer in the medial gaiter area of her right leg, which contained healthy granulation tissue with no evidence of infection.

INVESTIGATIONS

Initial investigations revealed a raised white cell count of 13 000, with raised neutrophil count of 12 000. C reactive protein was elevated at 229 mg/L. There were signs of acute renal impairment with a raised urea of 21 mmol/L. Creatinine was within normal limits. Alkaline phosphatase was raised at 450 IU/L but other liver function tests were normal. International normalised ratio was raised to >10 INR. Initial chest x-ray showed cardiomegaly with small pleural effusions but no obvious consolidation (figure 1A). Urine analysis was normal. A knee aspirate, swabs from the ulcer and stool and urine cultures did not yield any organisms. The patient had an ongoing fever throughout the first 2 days of admission and three sets of peripheral blood cultures taken on different days within 5 days contained the bacterium *A xylosoxidans*. This organism was resistant to all antibiotics with the exception of meropenem and tazobactam. A CT scan of the brain, chest, abdomen and pelvis did not reveal any abnormality that would explain a source of sepsis.

A transoesophageal echocardiogram (figure 1B) performed 10 days following admission to exclude endocarditis revealed vegetations present on the mitral and aortic valves. The mitral vegetations increased in size on repeat

Figure 1 A. Chest x-ray showing cardiomegaly and pleural effusions. B. Transoesophageal echocardiography (TOE) showing long vegetation on mitral leaflet and colour Doppler demonstrating mitral regurgitation. C. CT image at level of left atrium. D. Fused CT/gallium-67 hybrid scan showing increased uptake in region of left atrium/mitral valve. E. Repeat TOE after 6 weeks of intravenous antibiotics: vegetation now measures 17 mm in length.

transoesophageal echo 6 weeks later (figure 1E) despite intensive intravenous antibiotics.

DIFFERENTIAL DIAGNOSIS

Bacterial endocarditis should always be considered in patients who are febrile with murmurs and raised inflammatory markers.

Once the diagnosis of *A xylosoxidans* infection is established, possible immunocompromise in the patient should be considered and underlying malignancies etc. ruled out.

TREATMENT

The patient had a peripherally inserted central catheter line inserted soon after the diagnosis was established. The patient received a complete course of 6 weeks of intravenous meropenem and cotrimoxazole, as per microbiology guidance.

OUTCOME AND FOLLOW-UP

The repeat transoesophageal echocardiogram showed the vegetation on the mitral valve had increased significantly in size. A gallium-67 uptake scan showed diffuse increase in uptake in the mediastinum, which was localised to the left atrium/mitral valve area when the nuclear medicine images were fused with CT images (hybrid imaging by software registration)(figure 1C–D).

Mitral valve replacement surgery had been contemplated early in her course and her case discussed with the cardiac surgeons. However, the patient was very frail, clearly at

high surgical risk, and not eager to undergo high-risk surgery.

Unfortunately, the patient had a significant upper gastrointestinal haemorrhage on day 50 of intravenous antibiotics. Her haemoglobin level dropped to 6 g/dl and urgent endoscopy revealed a large necrotic duodenal ulcer, which was managed medically. Over the next 72 h, the patient developed multiorgan failure and died.

DISCUSSION

A xylosoxidans was first described in 1971 by Yabuuchi and Ohya, who isolated the organism from the ear discharge of six patients with recurrent otitis media.¹

It is an aerobic Gram-negative rod which is a pathogen most commonly associated with bacteraemia in patients who are immunocompromised.² It is a rare cause of community acquired and nosocomial infection but is most commonly found in patients with an underlying malignancy and cardiovascular disease.³

Two recent reviews of patients with *A xylosoxidans* bacteraemia revealed the commonest clinical presentations were primary bacteraemia, intravenous catheter related infection and pneumonia.^{4 5} Less commonly, the clinical presentation was meningitis, abdominal infections, endocarditis and pyelonephritis. Ramos *et al* reported 100% mortality from the three cases of infective endocarditis secondary to this organism.⁴

There are four case reports in the literature of prosthetic valve endocarditis secondary to *A xylosoxidans*.^{6 7 8} Martino *et al* in 1990 described one case of *A xylosoxidans* related

native valve endocarditis in a patient undergoing bone marrow transplantation with an indwelling central venous catheter.⁹

To the best of our knowledge, cases of native valve infective endocarditis secondary to *A xylosoxidans* in previously healthy patients without underlying malignancy have not been reported in the literature previously.

Learning points

- ▶ *Achromobacter xylosoxidans* is a rare cause of bacteraemia and is usually only seen in patients who are immunocompromised.
- ▶ *A xylosoxidans* is known to be a cause of prosthetic valve endocarditis but is very rarely found in those with native valves.
- ▶ *A xylosoxidans* is a difficult organism to eradicate and it is often resistant to usual antibiotics. In cases of endocarditis, surgical intervention should be considered early if the patient is clinically fit.

Competing interests None.

Patient consent Obtained.

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Storey A, Wilson A, McWilliams E. Native valve infective endocarditis due to *Achromobacter xylosoxidans* in an apparently immunocompetent individual. *BMJ Case Reports* 2010;10.1136/bcr.06.2010.3104, date of publication

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