CASE REPORT

The first report of survival post *Rothia aeria* endocarditis

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SUMMARY

A 61-year-old patient presented with drowsiness, decreased appetite and weight loss. On examination he had several splinter haemorrhages and a tender mass over the right temporal region. Respiratory and abdominal examinations were unremarkable and heart sounds were normal with no clinically audible murmurs. He spiked regular temperatures and consequently had several blood cultures taken. Transthoracic and transoesophageal echocardiogram showed a 3 cm mitral valve vegetation. MRI confirmed suspicions of septic emboli in the brain. Blood cultures grew *Rothia aeria* and he was started on benzylpenicillin, rifampicin and gentamicin. After a period of observation he deteriorated clinically and biochemically, surgical intervention therefore ensued with an urgent metallic mitral valve replacement. Nineteen days postsurgery the patient was successfully discharged on outpatient antibiotic therapy and warfarin. In view of complications such as embolisation and cerebral infarction, *R aeria* endocarditis should be managed aggressively and with a high index of clinical suspicion.

BACKGROUND

Rothia aeria is an aerobic, Gram-positive, coccoidal and coccobacillary or filamentous bacterium that belongs to the Micrococcaceae family (see figure 1). *R aeria* however, has only once before been identified to cause endocarditis; which resulted in a fatality after cerebral haemorrhage.^{1 2} Our case notes the first ever survival after *R aeria* induced endocarditis. The high rates of complications associated with *Rothia* species calls for early recognition and aggressive antibiotic therapy.

CASE PRESENTATION

A 61-year-old man with a medical history of hypertension and renal calculi presented with a 6-week history of drowsiness, decreased appetite and weight loss of 10 kg. In addition, he reported of a localised right-sided headache and fevers. He reported feeling generally unwell and having a dry cough but no other specific symptoms such as night sweats, urinary symptoms or chest pain. There was no history of intravenous drug use but he had travelled to Hong Kong 6 months ago and had also had a tooth extracted 5 weeks prior to admission. He lives at home with his wife and has no relevant family history.

An initial physical examination revealed a temperature of 38.8°C, a regular heart rate 105 bpm, blood pressure 99/69 mm Hg and saturations 99% on room air. The chest examination was

Figure 1 Gram stain direct from aerobic blood culture showing filamentous Gram-positive bacilli (x100 magnification).

unremarkable; a respiratory rate of 16 breaths per minute and no lymphadenopathy were noted. On auscultation normal vesicular breath sounds were heard with no clinically audible murmurs. The jugular venous pressure was not raised. Several splinter haemorrhages under the fingernails on both hands were seen, and a urine dipstick showed 3+ blood. A tender, hard 3×1 cm swelling was noted in the right temporal region. He scored 8/10 on an abbreviated mental test score. The abdominal examination was also unremarkable with no splenomegaly or hepatomegaly.

INVESTIGATIONS

Initial blood results showed an elevated C reactive protein, hyponatraemia and a normal white cell count. Two aerobically incubated blood cultures (BACTEC FX, BD diagnostics) taken on admission flagged positive with Gram-positive bacilli. *R aeria* was identified by matrix assisted laser desorption/ionisation (MALDI)-time of flight mass spectrometry (MALDI result 2.357, Bruker Diagnostics) following 48h standard incubation. Drug susceptibility testing showed sensitivity to penicillin and rifampicin. Chest radiograph showed a normal-sized heart with clear lung fields. An urgent transthoracic echocardiogram revealed vegetation on the anterior mitral valve leaflet with mild-moderate mitral regurgitation. Normal left ventricle dimensions and function were also noted. A head CT that was arranged to investigate his reduced cognitive function was unremarkable and an ultrasound of

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the right temporal artery showed a thickened medial wall. Transoesophageal echocardiogram performed 12 days after admission showed a 3 cm vegetation with an MRI confirming previous suspicions of septic emboli in the temporal artery. The resected heart valve was sent for 16S rDNA PCR which confirmed *R aeria*.

OUTCOME AND FOLLOW-UP

After successful medical and surgical valve replacement the patient's symptoms had resolved. In view of his cerebral emboli his antibiotics were converted to intravenous ceftriaxone with twice daily oral rifampicin postdischarge. A peripherally inserted central catheter (PICC) was sited in order for the patient to have outpatient antibiotic therapy. The patient was discharged 4 weeks after admission and was followed up in the community by the outpatient antibiotic team and district nurses. He was treated for a further 6 weeks postsurgery with antibiotics after which the PICC line was successfully removed. Recent review as an outpatient reaffirmed resolution of his symptoms with optimum surgical result achieved. Follow-up in the anticoagulation clinic is ongoing.

DISCUSSION

Rothia dentocariosa is the *Rothia* species that is more commonly known to cause endocarditis. It has also previously been detected as a normal oral cavity commensal in humans.³ *R aeria* on the other hand has been shown to cause acute bronchitis¹ but has only once ever been reported to have caused endocarditis.² In this case a 40-year-old Japanese man presented with fever, headache and arthralgia; he later went on to develop cerebral haemorrhagic infarction and died 15 days after admission.² Other previous reported cases of *R aeria* isolation have highlighted associations with septic arthritis and rheumatoid arthritis.⁴ Our case highlights the first ever survivor after *R aeria* induced endocarditis.

As with all patients who present with fever of unknown origin it is imperative that a thorough history and a clinical examination are undertaken. In particular specific attention should be paid to any risk factors that could predispose the patient to endocarditis. It is well known that a history of preceding dental procedures, history of intravenous drug use, previous endocarditis and underlying heart conditions are major risk factors for the development of endocarditis.^{5–6} Additional complications that may result from endocarditis such as septic embolisation should also be excluded. Septic embolisation itself is thought to occur in between 22% and 50% of cases of infective endocarditis.⁷ Sixty per cent of these cases are thought to result in death.⁸ If valve vegetations are greater than 10 mm in diameter or if the vegetation is sited on the anterior mitral valve leaflet there is an increased risk of cerebral infarction.^{9–11} The patient in our case satisfied both these criteria, interestingly as did the patient who passed away after the first documented case of *R aeria* endocarditis.² Our case demonstrates the importance of a high index of clinical suspicion and the need for prompt investigation and treatment of such complications.

Recent research has indicated that early surgery in patients with infective endocarditis and large vegetations also reduces the likelihood of death and risk of systemic embolization.⁷

This case demonstrates that prompt assessment; timely intervention and aggressive management of complications associated with *R aeria* endocarditis can result in better outcome.

Learning points

- ▶ *Rothia aeria* grown from blood cultures should be seriously considered as a possible cause of infective endocarditis and not merely a normal oral commensal.
- ▶ Sinister complications such as septic embolisation and cerebral infarction should always be excluded in all patients who are found to have infective endocarditis, in particular those that have grown *R aeria*.
- ▶ Surgical intervention should be undertaken earlier if adequate response to intravenous antibiotics has not occurred.

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