Rare disease

Kytococcus schroeteri prosthetic valve endocarditisTaher Yousri,¹ Mohammad Hawari,² Rasheed Saad,² Steve Langley²¹ Department of Trauma and Orthopaedics, University Hospital Bristol NHS Trust, Bristol, UK² Department of Cardiothoracic Surgery, Southampton University Hospital, Southampton, UK

Correspondence to Taher Yousri, taheryousri@yahoo.co.uk

Summary

We report the case of a 64-year-old male patient with a prosthetic aortic valve who presented with clinical features of endocarditis confirmed by transoesophageal echocardiography. His blood cultures were positive for a very rare and newly described organism—*Kytococcus schroeteri*. The patient underwent aortic valve replacement and a 6-week course of intravenous antibiotics. This is the fifth reported case of endocarditis associated with this organism.

BACKGROUND

Endocarditis is rarely associated with *Kytococcus schroeteri* and has only been reported four times previously in the literature. We report our experience in the management of this interesting case.

CASE PRESENTATION

A 64-year-old man with a previous history of two aortic valve replacements—the first one with aortic homograft for severe aortic stenosis in a bicuspid valve and the second one 16 years later with Carbomedics valve for severe aortic regurgitation—was referred to our hospital to evaluate him for emergency surgery for prosthetic aortic valve endocarditis and aortic root abscess.

He initially presented 2 weeks before referral with a fever of 38.7°C of 3 days' duration, malaise, lethargy and anorexia. Trans-thoracic echocardiography could not reveal any

vegetation but showed severe aortic regurgitation. His blood cultures isolated a Gram-positive organism, initially thought to be *Staphylococcus*, so the patient was started on intravenous vancomycin for presumptive endocarditis. Two days later, the isolated organism proved to be a *Micrococcus* species sensitive to rifampicin, gentamycin, linezolid and ticoplanin. Further studies on the isolated organism showed it was not a typical *Micrococcus*. The 16S rRNA of the isolate was analysed and results were compared to the sequences obtained from the National Center for Biotechnology Information. This showed the organism to be *Kytococcus schroeteri*.

The patient continued treatment with vancomycin 500 mg twice daily, rifampicin 600 mg twice daily and gentamycin 80 mg once daily. The patient did not show much improvement and he progressively became more short of breath. Transoesophageal echocardiography was done,

Figure 1 Transoesophageal echo showed echo-free space around the aortic valve and severe aortic valve regurgitation.

which showed severe aortic regurgitation and an aortic root abscess (figure 1).

On admission to our high dependency unit, the patient underwent further investigations and repeat transoesophageal echocardiography confirmed the previous findings. His investigations showed normal white cell count and a C reactive protein of 52. He also developed atrial fibrillation that was chemically cardioverted.

The patient underwent emergency aortic valve replacement. There was complete dehiscence of the aortic prosthesis in the region of the non-coronary sinus. Beneath this, there was a false aneurismal cavity 3×1.5 cm, which had contained what was effectively ventricular aortic discontinuity. The aortic valve showed extensive fibrinous deposits on the valve and the valve sutures most likely due to endocarditis. The valve was excised and size 22 mm homograft root with valve was sutured in place. The patient was weaned smoothly off bypass and he was transferred to the cardiac intensive care unit.

OUTCOME AND FOLLOW-UP

The patient recovered following his aortic valve surgery and the 6-week course of antibiotics. He was reviewed in the clinic 6 weeks post-discharge with no evidence of further infection or complications.

DISCUSSION

Despite the improvements in prosthetic valve design and material, prosthetic valve endocarditis (PVE) remains a serious complication occurring in up to 3.7% of patients who undergo primary or redo replacement surgeries.^{1 2}

A variety of microorganisms are involved in the pathogenesis of PVE. In early cases, *S epidermidis* is the responsible bacterium in most cases, followed by *S aureus*, *Enterococci* and fungi. However, in late PVE, *Streptococci* are the main causative organisms together with *S aureus*, *Enterococci* and the HACEK group (*Haemophilus*, *Actinobacillus*, *Cardiobacterium*, *Eikenella* and *Kingella*).^{1 3 4}

Micrococci rarely cause endocarditis. These organisms are usually regarded as contaminants from skin and mucus membranes. However, they are being reported as emerging pathogens in immunocompromised patients and have been described in severe infections.⁵ The genus *Kytococcus* was established in 1995 with the type *K sedentarius*. It was classified as a member of the family *Dermatophilaceae*.⁶

K schroeteri is a new micrococcal species that was first described in 2002.⁷ Cells are spherical and occur usually in pairs or tetrads. Colonies are between 1.5 and 2.5 mm in diameter after 48 h of incubation, muddy yellow, non-haemolytic, circular, convex and smooth, and they develop rather slowly. This species is negative by oxidase test, positive for alkaline phosphatase, arginine dihydrolase and pyrazinamidase, and negative for lecithinase, β -galactosidase and urease. It hydrolyses gelatin and Tween 80 but does not hydrolyse esculin or starch. The optimum growth temperature is 37°C. *K schroeteri* is resistant to

penicillin G, oxacillin and erythromycin, and susceptible to imipenem, chloramphenicol, ciprofloxacin, gentamicin, tetracycline, vancomycin and teicoplanin. The type strain is strain Muenster 2000.⁷

K schroeteri is likely to emerge as an increasingly important bacterial pathogen as five infections due to *K schroeteri* were described within a 5-year period: four cases of *K schroeteri* endocarditis and recently a fatal *K schroeteri* bacteraemic pneumonia in a patient undergoing chronic corticosteroid treatment.⁸

Sequencing of the 16S rRNA is the diagnostic tool for the correct identification of *K schroeteri*. However, Gram positive cocci that are arranged in tetrads and which are oxacillin resistant and arginine dihydrolase positive should raise a concern of a possible *Kytococcus* species.^{6 9}

Learning points

- *K schroeteri* is a newly described organism, which rarely can cause endocarditis.
- This organism can be misdiagnosed and should be suspected if Gram positive cocci are cultured but are oxacillin, penicillin G and erythromycin resistant.
- Sequencing of the 16S rRNA is the diagnostic tool for the correct identification of *K schroeteri*.
- *K schroeteri* is sensitive to imipenem, chloramphenicol, ciprofloxacin, gentamicin, tetracycline, vancomycin and teicoplanin.

Competing interests None.

Patient consent Obtained.

REFERENCES

1. Piper C, Körfer R, Horstkotte D. Prosthetic valve endocarditis. *Heart* 2001;**85**:590–3.
2. Agnihotri AK, McGiffin DC, Galbraith AJ, et al. The prevalence of infective endocarditis after aortic valve replacement. *J Thorac Cardiovasc Surg* 1995;**110**:1708–20; discussion 1720–4.
3. Vlessis AA, Khaki A, Grunkemeier GL, et al. Risk, diagnosis and management of prosthetic valve endocarditis: a review. *J Heart Valve Dis* 1997;**6**:443–65.
4. Karchmer AW. Infective endocarditis. In: Braunwald E, Zipes DP, Libby P, eds. *Heart Disease: A Textbook of Cardiovascular Medicine*. Vol 1. Sixth edition. Philadelphia, PA: WB Saunders Co 2001:1723.
5. Seifert H, Kaltheuner M, Perdreau-Remington F. *Micrococcus luteus* endocarditis: case report and review of the literature. *Zentralbl Bakteriol* 1995;**282**:431–5.
6. Stackebrandt E, Koch C, Gvozdiak O, et al. Taxonomic dissection of the genus *Micrococcus*: *Kocuria* gen. nov., *Nesterenkonia* gen. nov., *Kytococcus* gen. nov., *Dermacoccus* gen. nov., and *Micrococcus* Cohn 1872 gen. emend. *Int J Syst Bacteriol* 1995;**45**:682–92.
7. Becker K, Schumann P, Wüllenweber J, et al. *Kytococcus schroeteri* sp. nov., a novel Gram-positive actinobacterium isolated from a human clinical source. *Int J Syst Evol Microbiol* 2002;**52**:1609–14.
8. Mohammedi I, Berchiche C, Becker K, et al. Fatal *Kytococcus schroeteri* bacteremic pneumonia. *J Infect* 2005;**51**:E11–13.
9. Mnif B, Boujelbene I, Mahjoubi GR, et al. Endocarditis due to *Kytococcus schroeteri*: case report and review of the literature. *J Clin Microbiol* 2006;**44**:1187–9.

This pdf has been created automatically from the final edited text and images.

Copyright 2010 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.

BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Please cite this article as follows (you will need to access the article online to obtain the date of publication).

2 of 3
Yousri T, Hawari M, Saad R, Langley S. *Kytococcus schroeteri* prosthetic valve endocarditis. *BMJ Case Reports* 2010;10:1136/bcr.06.2010.3064, date of publication

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles

This pdf has been created automatically from the final edited text and images.

Copyright 2010 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.

BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Yousri T, Hawari M, Saad R, Langley S. *Kytococcus schroeteri* prosthetic valve endocarditis. *BMJ Case Reports* 2010;10.1136/bcr.06.2010.3064, date of publication

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow