

Case Report**Challenges in diagnosis and management of infective endocarditis by  
*Stenotrophomonas maltophilia*****A case report of an unusual nosocomial infection**

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**Abstract**

*Stenotrophomonas maltophilia* is a Gram-negative bacillus found as a free-living organism in most aquatic and humid environments including hospital drinking water, and often associated with nosocomial infections. It is an uncommon cause of infective endocarditis. In Sri Lanka there are no reported cases in literature.

Here we report a 46 years old patient who presented with fever following Percutaneous Trans Mitral Commissurotomy (PTMC). He was diagnosed as an acute mitral valve endocarditis based on echocardiograph findings and 2 blood cultures taken 6 hours apart which grew *Stenotrophomonas maltophilia*. The patient responded rapidly to targeted antibiotic treatment with piperacillin tazobactam and oral cotrimoxazole for 4 weeks and a further 2 weeks of cotrimoxazole. He remained well at the 3 month follow up.

There is limited information on the best choice of antibiotics and the ideal duration of treatment. Early diagnosis and identification of the organism, prompt treatment with appropriate antibiotics and close collaboration between the clinical and laboratory teams contributed towards the successful management of this case.

*Keywords: Stenotrophomonas maltophilia, endocarditis, PTMC, nosocomial infection*

**Introduction**

*Stenotrophomonas maltophilia* is a glucose non fermenting Gram negative bacillus, found as a free-living organism in most aquatic and humid environments, including hospital drinking water.<sup>1</sup> Although it is an uncommon pathogen in humans, nosocomial infections especially among immunocompromised patients are increasing.<sup>2</sup> Importance of this organism is emphasized due to

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its multiple antibiotic resistance.

*S. maltophilia* is an uncommon agent to cause infective endocarditis with less than fifty cases reported worldwide so far.<sup>1</sup> It has got higher morbidity and mortality rates. There have been no previous cases reported in Sri Lanka.

### **Case Report**

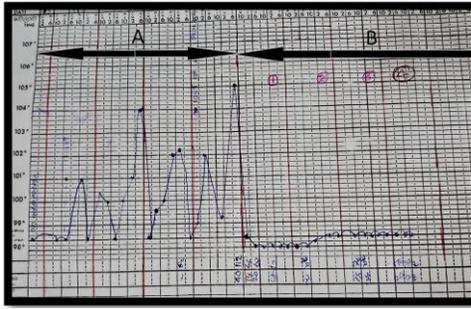
A 46 years old male was admitted to the hospital with high fever associated with chills and rigors for 2 days. He was diagnosed to have tight mitral valve stenosis and had undergone PTMC for the second time (two months following the first PTMC) about three days prior to the onset of fever. He did not give a history of dental procedures or injections of intravenous drugs.

On examination he was febrile. His pulse rate was 71/min and blood pressure was 112/78mmHg. There were no peripheral stigmata of infective endocarditis. His white blood cell count was  $8.7 \times 10^3 /\mu\text{L}$  with 68.4% of neutrophils. The CRP was 74 mg/L. He was started on intravenous meropenem on the suspicion of a nosocomial infection but with poor response.

Two blood cultures were taken six hours apart on the day following admission which became positive for a Gram negative non fermentative bacillus, identified as *S. maltophilia* by RapID™ (Remel) kit with “implicit” accuracy (>99%). Antibiotic sensitivity was performed using the disk diffusion method (CLSI guidelines 2018). Both isolates showed the same antibiotic sensitivity pattern, sensitive to co-trimoxazole and intermediate to levofloxacin. There were large zones for piperacillin-tazobactam, and amikacin (25mm and 18mm respectively) and no zones for meropenem, gentamicin and netilmicin. Minimum inhibitory concentration (MIC) could not be performed due to lack of facilities.

This patient with diagnosed valvular heart disease was admitted with fever following PTMC and two blood cultures grew the same organism, raising the suspicion of infective endocarditis. Transthoracic and transesophageal echocardiographs were therefore done. Both showed a suspicious mass attached to chordae of mitral valve which was 5×3mm in size. There were no other foci of infection such as central lines to cause bacteraemia and therefore, infective endocarditis was considered the most probable diagnosis.

The patient was started on IV piperacillin tazobactam 4.5g 6 hourly and oral cotrimoxazole 1920mg 12 hourly as per antibiotic sensitivity pattern of the isolate. Due to the unavailability of IV cotrimoxazole, high dose oral cotrimoxazole was given.



**Figure 1: Temperature chart of the patient**

A – Meropenem    B – Co-trimoxazole

The response to the treatment was prompt and extremely satisfactory. Fever came down to the baseline from the second day of initiating the antibiotic combination (Figure 1). Similar results have been previously reported.<sup>2</sup> Subsequent transthoracic echocardiographs done at 2 week intervals showed remarkable reduction in vegetation size. The patient improved clinically and CRP came down to 23mg/L within five days of commencing the antibiotic regime. He was given this combination of antibiotics for 4 weeks with an additional 2 weeks of oral cotrimoxazole. On discharge after 4 weeks of IV-oral combination, the CRP was <6mg/L and vegetations

were not detected. He was regularly followed up in the clinic with repeated full blood count and CRP for 3 months during which he showed full clinical recovery with normal investigation reports.

## Discussion

*Stenotrophomonas maltophilia* is a nosocomial pathogen and infections due to this organism have been increased along with their importance in the hospital setting.<sup>1</sup> The risk groups to develop this infection include patients with debilitated illnesses, patients with indwelling vascular catheters and patients who had undergone surgical procedures.<sup>2</sup>

*S. maltophilia* is a rare organism to cause infective endocarditis. Less than 50 cases have been reported worldwide so far with involvement of both prosthetic valves and native valves. Prior valve replacement had been a common predisposing factor. With the loss of intact skin barrier during the invasive procedures, organisms contaminating the medical equipment may be the cause for endocarditis.

Infective endocarditis due to *S. maltophilia* is known to carry a higher rate of mortality and complications.<sup>2</sup> Some patients require surgery irrespective of the longer duration of antimicrobial therapy.<sup>2</sup> Cerebrovascular diseases, congestive cardiac failure and organic abscesses were the observed complications.<sup>1</sup> No complications were noted in this patient.

Treatment of this infection is challenging due to the intrinsic antibiotic resistance of this organism and limited experience. According to the literature, despite in-vitro sensitive zones for certain antibiotics, in-vivo resistance can occur as in piperacillin tazobactam where MIC is required to determine the sensitivity.<sup>3</sup> However, piperacillin tazobactam has been used effectively in infections caused by *S. maltophilia*.<sup>1</sup> Trimethoprim-sulfamethoxazole is considered the first line antibiotic. Being bacteriostatic, addition of other antibiotics is required for synergistic effect. There is evidence of effective combination therapy with aminoglycosides, fluoroquinolones, penicillins and the third and fourth generation cephalosporins<sup>1,4</sup> but both isolates in the present case were resistant to these antibiotics. Intolerance to trimethoprim-sulfamethoxazole with a long duration of therapy can cause difficulty in treatment. Along with the antibiotic therapy, surgical removal of infected indwelling foreign materials should be done if required.<sup>1</sup>

Early diagnosis and identification of the organism, prompt treatment with sensitive antibiotics and the collaborative work and the dedication of the cardiologists and the microbiology team have contributed to the rapid clinical improvement and the ultimate cure of the patient.

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