Case report

Relapsing bacteraemia due to *Micrococcus luteus* in a haemodialysis patient with a Perm-Cath catheter

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**Introduction**

Infection remains a major complication of permanent catheters used for long-term haemodialysis. The optimal approach to bacteraemia remains to be established and varies with the infecting organism and patient factors such as age and immunocompetence [1]. Species of micrococci are generally considered as non-pathogenic commensals that colonize the skin, mucosae, and oropharynx. However, it is now recognised that Micrococcus spp. can be opportunistic pathogens in the immunocompromized patient [2,3].

We describe a case of *Micrococcus luteus* central venous catheter colonization with bacteraemia in a haemodialysis patient. Persistent bacteraemia, which was unresponsive to several courses of antibiotic therapy, was successfully treated by catheter removal.

**Case report**

A 48-year-old woman with end-stage renal disease due to lupus nephritis began chronic haemodialysis in October 1984. She received a first renal graft in August 1985, which had to be removed because of renal artery thrombosis. The patient continued on chronic intermittent haemodialysis until June 1986, when she received a second cadaveric renal graft. The transplantation was complicated by chronic rejection, leading to renal graft failure in February 1988 when she returned to haemodialysis. After multiple vascular access operations on both arms, the creation of a further peripheral haemodialysis access was impossible. In March 1993 a double-lumen Perm-cath catheter was placed in the right internal jugular vein. Several episodes of infection due to staphylococcus coagulase-negative had responded to vancomycin. From August 1995 until November 1996, several episodes of fever were empirically treated with vancomycin. In each febrile episode blood cultures obtained from the catheter were positive for Micrococcus spp.

In December 96, 30–60 min before the end of the dialysis session the patient began to have episodes of cold chills. Afterwards it was followed by a increase in body temperature (38–39°C), lasting 4–5 h. The symptoms receded and she experienced no fever during the rest of the interdialysis period. The patient always had the same reaction during subsequent dialysis sessions. At that time her only medication was prednisone 5 mg/day and occasional paracetamol. Haemodialysis was performed according to a standard schedule (4 h × 3) using an AN69 membrane filter and a bicarbonate powder cartridge system. The physical examination revealed a poorly nourished woman, with a body weight of 46 kg. There was no sign of an exit-site infection associated with the catheter. No other abnormal findings were found. Serial blood cultures taken through the catheter were always positive for Micrococcus spp., which were biologically identified as Micrococcus luteus. An antibiogram showed that the pathogen was sensitive to vancomycin, cloxacillin, erythromycin, and rifampicin. White blood cell (WBC) counts were repeatedly performed, before (WBC 5.9 × 10^9/l) during (WBC 4.5 × 10^9/l) and after (WBC 4.2 × 10^9/l) dialysis treatments. Catheter angiographic examination was performed because of blood flow reduction during haemodialysis; no dislocation, intraluminal thromboses, or fibrin sheet were demonstrated. She was treated with a 2-week course of vancomycin. The patient’s symptoms failed to improve and treatment with oral cloxacillin was administered for 1 week. Again, this treatment was not successful. Cloxacillin was stopped and replaced by oral azithromycin. A standard dose of 500 mg once daily for 3 consecutive days was given. A total course of 2 weeks was administered. The patient did not respond satisfactorily to treatment and the symptoms did not disappear. The catheter was then removed and cultures demonstrated a massive growth of *Micrococcus luteus*. Blood cultures

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were thereafter always negative. Afterward she remained well on haemodialysis, and to date the Micrococcus has not returned.

**Discussion**

Bacterial infections, generally due to common pyogenic bacteria, remain a major cause of morbidity and mortality in uraemic patients treated with chronic haemodialysis. Micrococcus spp. are usually regarded as non-pathogenic skin commensals. However, Micrococcus spp. can be opportunistic pathogens in immunocompromized patients. There are some reports of micrococci cultured from clinical specimens [2,3]. *Micrococcus luteus* has been implicated as the causative agent in cases of intracranial abscesses [4], pneumonia [5], septic arthritis [6], and meningitis [7]. In addition, strains identified as Micrococcus spp. have been reported recently in infections associated with indwelling intravenous lines, continuous ambulatory peritoneal dialysis fluids, ventricular shunts and prosthetic valves [8–13].

In this patient, micrococcus was initially seen as a possible contaminating micro-organism. However, the absence of micro-organisms other than Micrococcus spp. in several blood cultures, plus the repeated presence of the micro-organism in subsequent blood specimens and in the catheter, suggest strongly that Micrococcus spp. were primarily responsible for the episodes of bacteraemia. On the other hand, the patient had pyrogenic-like reactions during and after the end of the haemodialysis session and was symptom-free during the rest of the interdialysis period. This suggests that during treatment, the blood flow along the catheter mobilizes the bacteria, or its pyrogens substances, which induce production of cytokines that finally cause the clinical symptoms. Since the patient was well during the interdialysis period, we believed that the catheter colonization was always present, but not the infection, even if this distinction is often difficult. However, as staphylococcus and other pyogenic bacteria, rather than opportunistic agents, are the major causes of catheter colonization and secondary infections in dialysis patients, we report the first case of *Micrococcus luteus* central venous catheter colonization with bacteremia in a haemodialysis patient. Adherence of bacteria to the silastic tube, as demonstrated in other micro-organisms, would possibly explain the failure of treatment by antibiotics alone.

In summary, this report emphasizes that *Micrococcus luteus* should be considered as an emerging nosocomial pathogen in immunocompromized patients. Persistent bacteraemia unresponsive to medical management should be treated by catheter removal.

**References**


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