

Septic arthritis caused by treatment resistant *Pseudomonas cepacia*

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Abstract

A case of septic arthritis of the knee caused by *Pseudomonas cepacia* following an intra-articular corticosteroid injection in a patient with a history of osteoarthritis is presented. This is the second report of this agent causing infection in a diarthrodial joint, which proved difficult to eradicate despite in vitro antibiotic sensitivity.

About 5-10% of all cases of septic arthritis occurring in adults are caused by Gram negative bacilli.^{1 2} The two most important factors predisposing to the development of Gram negative arthritis are intravenous drug use and an impaired host defence.^{1 3}

Pseudomonas cepacia, an organism traditionally regarded as having low pathogenicity in humans, has become recognised as an important nosocomial pathogen.^{4 5} Two reports of *P cepacia* arthritis treated successfully on the basis of in vitro antibiotic sensitivities have appeared.^{6 7} In one of these septic arthritis of the ankle followed repeated intra-articular steroid injection from a contaminated vial of methylprednisolone.⁷ We report a case of *P cepacia* causing septic arthritis of the knee that remained culture positive for 44 days despite intravenous antibiotics, repeated needle aspiration of synovial fluid, and open synovectomy.

Case report

A 72 year old woman with a history of osteoarthritis was admitted for evaluation of severe right knee pain, swelling, and fever. One week before admission she had received an intra-articular corticosteroid injection into her right knee.

The past medical history was unremarkable except for allergy to penicillin. Physical examination showed a pleasant, disoriented woman. Her temperature was 37.6°C, blood pressure 150/94 mmHg, pulse 104/minute, and respiratory rate 20/minute. Positive findings included marked warmth, tenderness, and swelling of the right knee. A stool specimen was positive for occult blood. An x ray examination of the knees showed changes of moderately severe osteoarthritis with joint space narrowing and osteophyte formation.

Treatment with vancomycin and tobramycin was started. After 72 hours Gram negative rod isolates were transferred from chocolate blood agar medium to MacConkey medium and found to be lactose and oxidase negative. *P cepacia* was identified using the criteria outlined by

Antimicrobial susceptibility of *P cepacia* isolates

Antimicrobial agent	Sensitivity*	MIC* (µg/ml)
Amikacin	R	>32.00
Ampicillin	R	>16.00
Cephazolin	R	>32.00
Cephmandole	R	>32.00
Cefoxitin	R	>32.00
Chloramphenicol	R	16.00
Gentamicin	R	>16.00
Piperacillin	S	16.00
Ticarcillin	R	>128.00
Trimethoprim/ Sulphamethoxazole	S	<0.50/9.50
Tobramycin	R	>16.00
Imipenem	I	8.00
Ticarcillin	R	>128.00
Ceftriaxone	S	16.00
Ceftazidime	S	<4.00

*S=sensitive; R=resistant; I=intermediate; MIC=minimum inhibitory concentration.

Otto and Pickett⁸ as modified for the APIC rapid non-fermenting technique strips (Analytab Products, Plainview, NY).⁹ Blood and spectrum cultures remained negative. Antimicrobial minimum inhibitory concentrations were determined by the microtitre dilution technique (table).

The antibiotic was changed to trimethoprim-sulphamethoxazole. Synovial fluid cultures from the right knee remained positive for *P cepacia*. Eight days after admission the patient underwent open synovectomy. After 13 days trimethoprim-sulphamethoxazole was discontinued because of drug rash and renewed fever. Intravenous chloramphenicol was begun. After initial improvement, fever and effusion recurred. Intravenous ceftazidime was started. On the 36th day repeat open drainage and synovectomy were performed. The patient was then transferred to this institution. Repeat synovial cultures showed *P cepacia* with an identical antimicrobial susceptibility profile. Intravenous ceftazidime (2 g every eight hours) was continued; serum peak concentrations were 190 µg/ml and bactericidal titres were >1/256. Daily aspiration of synovial fluid was performed with a large bore needle. The synovial fluid white blood cell count gradually decreased to less than 1.25×10^9 cells/l. Cultures became negative after eight days. Subsequent x rays of the right knee showed progressive joint space narrowing and confluent subchondral bone plate erosions. During this period the patient underwent colectomy to control recurrent severe colonic bleeding due to arteriovenous malformation. The knee pain slowly resolved and the patient's nutritional status improved. After 60 days antibiotics were discontinued.

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Discussion

Pseudomonas cepacia is ubiquitous in the environment and has been isolated from many human sources as well as aqueous solutions and equipment found in hospital.^{4 10-13}

Treatment of *P cepacia* is often difficult. It is reported to have in vitro sensitivity to trimethoprim-sulphamethoxazole,¹⁴ chloramphenicol,¹⁵ and cefoperazone.⁶ It is generally resistant to polymyxins, aminoglycosides, first and second generation cephalosporins, and traditional anti-pseudomonal penicillins such as ticarcillin.¹⁰ In marked contrast with the previously cited report in which the *P cepacia* organism was found to be sensitive to gentamicin,⁷ the organism recovered was more typical. It was not only gentamicin resistant, but also proved difficult to eradicate in vivo despite the use of third generation cephalosporins to which in vivo sensitivity was shown.

Doctors evaluating otherwise healthy patients presenting with septic arthritis following open trauma, surgery, or joint injections must be alert to the possibility of such unusual organisms causing infection. Even with the available antibiotic armamentarium, treatment will continue to pose a major challenge.

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