

PASTEURELLA MULTOCIDA OSTEOMYELITIS OF THE CERVICAL SPINE IN A PATIENT ON CHRONIC HAEMODIALYSIS

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ABSTRACT

Osteomyelitis due to *Pasteurella multocida* has been frequently documented but virtually all previous cases have resulted from direct inoculation of the organism or contiguous spread of local infection, following animal bites or scratches. Infections often occur in patients with serious underlying illnesses. Haematogenous osteomyelitis due to *P multocida* has very rarely been reported particularly in patients with chronic renal failure. We describe a patient on chronic haemodialysis who developed an acute febrile illness, two months following a monkey bite, caused by haematogenous cervical vertebral osteomyelitis due to *P multocida*.

Keywords: Osteomyelitis, *Pasteurella multocida*

SINGAPORE MED J 1990; Vol 31: 400 - 402

INTRODUCTION

Pasteurella multocida is a small gram-negative coccobacillus which causes haemorrhagic septicaemia in many domestic and wild animals. It may also cause infection in man, most frequently cellulitis secondary to animal bites and scratches. Local complications of infection are not uncommon⁽¹⁾ and include septic arthritis in adjacent joints, and osteomyelitis by direct inoculation or contiguous spread of infection. Infections often occur in patients with underlying illnesses. To our knowledge, only 2 cases of haematogenous osteomyelitis have been previously reported^(2, 3) and chronic renal failure has been documented as an underlying condition in two patients only^(3, 4). We report an unusual case of haematogenous osteomyelitis of the cervical spine, due to *Pasteurella multocida*, in a patient on chronic haemodialysis.

CASE REPORT

A 54 year old Chinese man had been on chronic

haemodialysis since 1985. He was admitted to the National University Hospital with a 3 day history of high fever, chills and rigors. The fever was accompanied by sore throat, nasal congestion, myalgia and severe pain in the neck. He had not had any neck or shoulder pain previously and there was no history of trauma to the region. He had been bitten in the left hand by a wild monkey two months ago but had not developed any local infection or fever following the bite. He had not received any treatment. He did not have any pets and did not have any more recent history of animal bites or scratches.

On admission, the patient had a temperature of 39.5°C. He was unable to move his neck because of pain and there was diffuse tenderness over the back of the neck and upper shoulders with spasm of the paravertebral muscles. The throat and pharynx were normal and the chest was clear. There was no evidence of any animal bites, scratches or cellulitis. There were no neurological deficits.

The white cell count on admission was $9.18 \times 10^9/l$ with 87.3% polymorphs and 6.7% lymphocytes. The erythrocyte sedimentation rate (ESR) was greater than 150 mm/hour. X-rays of the cervical spine showed narrowing of the disc space between cervical 5 and 6 (C5-6) vertebral bodies, and marked irregularity of the adjoining cortical margins of the vertebral bodies suggesting vertebral end-plate destruction (Fig 1). The bony destruction of C6 vertebral body was confirmed on CT scan of the cervical spine (Fig 2). A bone scan revealed an area of increased radioisotope uptake in the same region (Fig 3). *Pasteurella multocida* was isolated from three of three specimens sent for blood culture. Sensitivity testing revealed that the organism was sensitive to penicillin, ampicillin, cefuroxime and gentamicin.

The patient was initially treated with intravenous cefotaxime but when the results of the blood cultures were known, this was changed to intravenous

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Fig 1

Lateral X-ray of the cervical spine at time of presentation, showing C5, C6 vertebral bodies. There is significant narrowing of the C5-C6 disc space. Arrows indicate marked irregularity of the cortical margin of C6 vertebral body suggesting vertebral end-plate destruction.

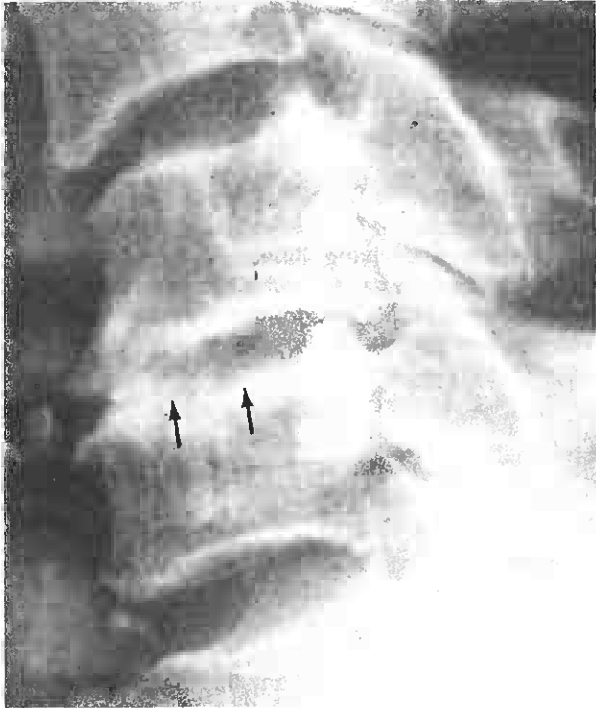


Fig 2

CT scan of the cervical spine at presentation showing bony destruction of C6 vertebral body.

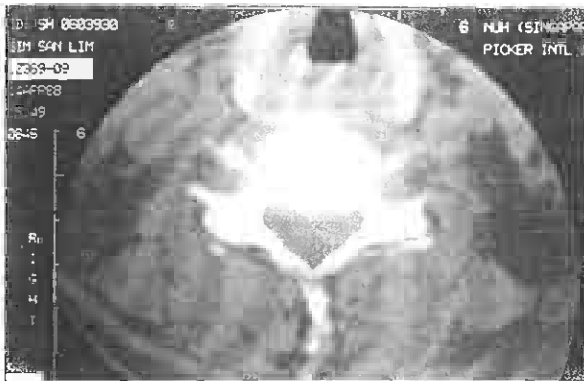


Fig 3

Radioisotope bone scan performed at presentation. Arrow indicates area of increased radioisotope uptake at C6 level.

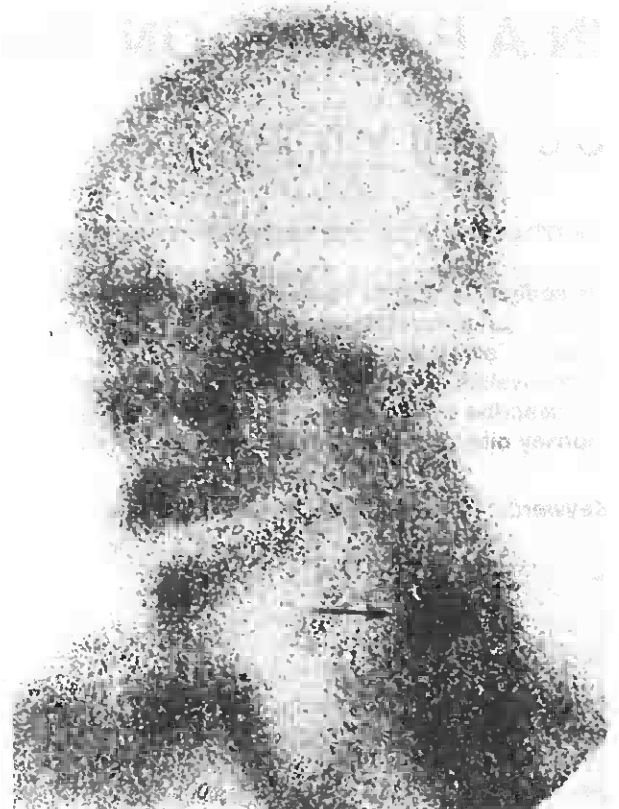


Fig 4

Lateral X-ray of the cervical spine after 4 weeks of antibiotic therapy. Arrow indicates anterior bridging of C5 and C6 vertebral bodies due to new bone formation.



benzylpenicillin at a dose of 500,000 units 8 hourly. Treatment was accompanied by rapid defervescence. The neckache improved gradually and there was no further pain or limitation of cervical movement after four weeks of antibiotic treatment. Repeat X-rays of the cervical spine at that time showed anterior 'bridging' of cervical 5 and 6 vertebral bodies due to new bone formation (Fig 4). Intravenous penicillin was stopped after 4 weeks and the patient was discharged on oral ampicillin, at a dose of 500 mg 6 hourly, for a further 2 weeks. The patient has remained well while on follow-up.

DISCUSSION

There are three main clinical patterns of human *Pasteurella multocida* infection. The commonest form is

local wound infection or cellulitis following animal bites or scratches(5). The second clinical pattern is serious respiratory tract infection, usually in patients with underlying chronic lung disease. The third common presentation is that of systemic infection from *P. multocida* bacteraemia.

Bone and joint involvement is the most frequent serious complication associated with *P. multocida* infection. Virtually all previously reported cases of osteomyelitis due to *P. multocida* have developed due to local extension of soft tissue infection or direct inoculation of the organism into the periosteum by animal bites^(1, 6). Two cases of haematogenous osteomyelitis have been reported; one affecting the lumbar spine in a patient with cirrhosis and the other involving the cervical spine in a patient with polycystic kidney disease^(2, 3). The present patient is different from the 2 previously reported ones as there was a long asymptomatic period between the monkey bite and the clinical occurrence of osteomyelitis. It is possible that the bite had induced a transient *P. multocida* bacteraemia which had resulted in the seeding of a spondylolitic cervical spine. This bony involvement may have remained quiescent for a time until subsequent reactivation caused it to manifest clinically as a subacute osteomyelitis. The presence of a period of quiescence has been previously noted in one review which reported that in four of twenty patients with *P. multocida* osteomyelitis, the skeletal infections became symptomatic, or were reactivated, after periods of quiescence ranging from six months to several years⁽⁶⁾.

In the present patient, the diagnosis of *P. multocida* infection was not initially suspected because the significance of the antecedent animal bite had not been appreciated. *P. multocida* has been isolated from the digestive systems of a wide variety of animals and carriage rates of the organism in the oral or nasal

secretions of healthy animals may be quite high: 70 to 90% in cats, 50 to 66% in dogs and 51% in pigs⁽¹⁾. Furthermore, most clinical infections with *P. multocida* in man have followed animal bites or scratches, most often by cats and dogs^(5, 6) but also following bites by such diverse animals as the rat, lion, rabbit, pig and wolf⁽¹⁾. Awareness of the possible significance of the history of the monkey bite in our patient would have allowed a more appropriate choice of empirical antibiotic coverage early in the course of the illness.

Pasteurella multocida is usually an opportunistic pathogen. In a review of 95 patients, Raffi et al noted the presence of an underlying disease in 72% of cases⁽⁷⁾. The most common predisposing conditions were cirrhosis, malignancies, chronic obstructive pulmonary disease and rheumatoid arthritis. Chronic renal failure has been reported as the underlying disease predisposing to *P. multocida* infection in only 2 cases to date^(3, 4).

The treatment of choice for *P. multocida* infections is penicillin^(1, 8) because of its efficacy, safety and low cost. In serious infections, however, antibiotic therapy should be guided by susceptibility testing of isolates as penicillin-resistant strains have been described in a few human cases^(9, 10). In the treatment of osteomyelitis, it is recommended that parenteral penicillin should be given for four to six weeks⁽¹⁾. The role of surgery is unclear but surgical removal of devitalized tissue may be required in some cases⁽⁶⁾. In our patient, there was excellent response to intravenous benzylpenicillin alone and surgical intervention was not required.

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