G. J. Velan
J. Leitner
Y. Folman
R. Gepstein

Brucellosis of the spine with a synchronous *Staphylococcus aureus* pyogenic elbow infection

Received: 18 April 1996
Revised: 6 August 1996
Accepted: 12 August 1996

G. J. Velan (✉)
Department of Orthopedics,
Rabin Medical Center, Hasharon Hospital,
Petach-Tiqua, Israel

J. Leitner · R. Gepstein
Spinal Care unit,
Meir Hospital, Kfar-Saba, Israel

Y. Folman
Orthopedic Department,
Hilel Yafe Hospital, Hadera, Israel

Abstract *Staphylococcus aureus* osteomyelitis and pyogenic arthritis has a different pattern in the elderly than in the young. The axial skeleton is the most frequent site of infection and treatment is usually by intravenous antibiotics. We report a case of *Staph. aureus* septic arthritis of the elbow with concomitant osteomyelitis of the spine that was thought to be due to *Staph. aureus*,

but culture of debrided material from the lesion grew *Brucella* in culture. We suggest that in the elderly it is advisable to obtain a tissue culture diagnosis and not to instigate therapy based on positive blood cultures or a concomitant infection.

Key words Spine · Osteomyelitis · *Brucella* · Synchronous infection

Introduction

A rare case of synchronous methicillin-resistant *Staphylococcus aureus* (MRSA) septic arthritis of the elbow with spinal infection caused by *Brucella melitensis* shows the necessity of definitive culture diagnosis when treating spinal infection in the elderly.

Brucellosis of the spine, infrequent in North America and western Europe, is a common disabling disease in the Mediterranean basin, *Brucella melitensis* from goats being the main isolated organism [6]. Brucellosis of the spine affects farmers who are in contact with cattle, goats, or sheep and the consumers of unpasteurized milk [10]. There are no pathognomonic symptoms or signs and a high index of suspicion is required in order to diagnose this disease correctly. Most of the afflicted have a positive *Brucella* titre [7], which is currently the mainstay of the diagnostic workup for brucellosis.

In pyogenic osteomyelitis and septic arthritis, the chief offending organism is *Staphylococcus aureus*. An increasing number of elderly patients is affected, and the spine is the most common site of infection [3]. It is common prac-

tice to assume a vertebral lesion with radiographic characteristics of a pyogenic infection is due to *Staphylococcus aureus* when this organism is isolated from the blood or a joint aspirate [8].

Case report

K.M., a 79-year-old man, an Arab agricultural worker, had a 2-month history of vague low back pain radiating down his right lower extremity. Clinical examination by an orthopedist and lumbar spine X-ray did not reveal any pathology that could account for his pain.

A month later the patient suffered septic arthritis in his left elbow due to MRSA. Blood and joint fluid cultures were positive for MRSA and intravenous treatment with vancomycin was started. He was discharged 1 week later in an acceptable condition with outpatient parenteral vancomycin therapy. The patient returned 1 week later complaining of severe upper back pain and anal incontinence. Upon examination he was febrile and visibly suffering. Body temperature was 37°C, blood pressure was 130/80 mmHg, and pulse rate was 80 and regular. Abnormal findings were an enlarged spleen and mild left elbow bursitis. Neurological examination revealed right L5 root palsy, hypoesthesia below the D10 dermatome, and weak anal sphincter tone.

Laboratory results were compatible with a mild infective process, blood cultures grew *Staph. aureus* of the MRSA type.

Fig. 1 CT axial image of T9 showing an extensive lytic lesion of the anterior elements with destruction of the posterior wall

Plain X-ray of the thoracic spine showed a lytic lesion in the T8 and T9 vertebral bodies. Bone scan demonstrated pathological concentrations of radioisotope in the sternum and thoracic and lumbar spine. CT axial imaging of the thoracic spine (Fig. 1) showed marked destruction of the anterior elements of T9 and T8, destruction of the posterior wall, and involvement of the vertebral canal.

It was assumed that the patient's lesion was due to MRSA, debridement of the lesion was carried out through an anterior approach, and the defect in the vertebral bodies was filled with autologous bone graft.

Tissue culture was negative for MRSA but *Brucella* was isolated.

The postoperative period was uneventful. The patient was transferred to a rehabilitation center since no neurological improvement was seen in the immediate postoperative period.

Discussion

The incidence rate of osteomyelitis in the elderly is currently on the rise [3] and the axial skeleton is the most

common site, the vertebral bodies being mainly affected [2, 5]. Though *Staph. aureus* is the cardinal pathogen, and in the young a positive blood culture is a good enough basis to determine the diagnosis, it is erroneous to rely on this in the elderly. Several authors [4, 5] have pointed out that in elderly patients a synchronous urinary tract or pulmonary infection can be misleading, delaying the correct identification of the offending organism in vertebral pyogenic osteomyelitis. The diagnosis of the causative organism in vertebral pyogenic osteomyelitis in the elderly should therefore not be based on blood or joint aspirate cultures. Every effort should be made to obtain tissue for culture, either through CT-guided needle biopsy, which has a 60–96% success rate [1, 9], or an open procedure if the former has not allowed identification of the infecting organism.

The patient reported here had many risk factors for brucellosis [3] and his symptoms were typical of spinal brucellosis [4]. The concomitant elbow MRSA infection most probably masked the brucella infection in the thoracic spine. The onset of neurological symptoms drew attention to the spinal infection, which was then attributed to hematogenous spread of MRSA from the infected elbow. The identification of *Brucella* as the offending organism in a direct tissue culture proves that peripheral culture can be misleading in the investigation of vertebral osteomyelitis. The elbow MRSA infection most probably lowered the patient's immune status and enabled the rapid proliferation of the spinal *Brucella* infection.

Conclusions

Cultures of peripheral blood or other bodily fluids can be misleading in the elderly when there is evidence of a pyogenic vertebral infection. The high prevalence of other asymptomatic infections in the elderly makes obtaining tissue diagnosis mandatory before the commencement of antibiotic treatment.

References

1. Bender CE, Berquist TH, Wold LE (1986) Imaging-assisted percutaneous biopsy of the thoracic spine. *Mayo Clin Proc* 61: 942–950
2. Cahill DW, Love LC, Rehtine GR (1991) Pyogenic osteomyelitis of the spine in the elderly. *J Neurosurg* 74: 878: 886
3. Espersen F, Frimodt-Møller N, Thandrup-Rosdahl V, Skinhøj P, Bentzen W (1991) Changing pattern of bone and joint infections due to *Staphylococcus aureus*: study of cases of bacteremia in Denmark, 1959–1988. *Rev Infect Dis* 13: 347–358
4. Frederickson B, Youn H, Orlans R (1978) Management and outcome of pyogenic vertebral osteomyelitis. *Clin Orthop* 131: 160–167
5. Gepstein R, Folman Y, Lidor C, Barchillon V, Catz A, Hallel T (1992) Management of pyogenic vertebral osteomyelitis with spinal cord compression in the elderly. *Paraplegia* 30: 795–798
6. Pajapakse CN (1995) Bacterial infections: osteoarticular brucellosis. *Baillieres Clin Rheumatol* 9: 161–177
7. Sadat Ali M, al-Mousa MS, al-Salem AH (1991) Brucellosis as a cause of backache. *Trop Geogr Med* 43: 148–151
8. Sapico FL, Montgomerie JZ (1979) Pyogenic vertebral osteomyelitis: report of nine cases and review of the literature. *Rev Infect Dis* 1: 754–776
9. Stocker DJ, Kissim CA (1985) Percutaneous vertebral biopsy: a review of 135 cases. *Clin Radiol* 33: 469–577
10. Tekkök TH, Berker M, Özcan OE, Ozgen T, Akalin E (1993) Brucellosis of the spine. *Neurosurgery* 33: 838–844