M. M. Muhdi · T. A. Hamdam

Marginal wedge resection for chronic osteomyelitis of the iliac bone

Accepted: 6 November 2002 / Published online: 5 April 2003
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Abstract Six patients with chronic osteomyelitis of the iliac bone were treated with marginal resection of the infected segment. All patients were healthy active males without predisposing factors. Their age ranged between 14 and 38 years. All patients had recurrent drainage of abscesses for 2–9 years. In three patients, the infection followed a gunshot injury, in two the infection was haematogenous in origin, and in one the infection followed a surgical bone graft procedure. The outcome was successful for all patients, who have been followed regularly for 2–10 years.

Résumé Six malades avec une ostéomyélite chronique de l'os iliaque ont été traités par résection marginale du segment infecté. Tous les malades étaient des hommes actifs sans facteur prédisposant, âgés de 14 à 38 ans. Il avaient tous des fistules récidivantes ou des abcès depuis 2 à 9 ans. Dans trois cas l'infection a suivi une blessure par arme à feu, deux fois elle était d'origine hématogène et une fois elle était la conséquence d'une prise de greffe osseuse. Le résultat était bon pour tous les malades qui ont été suivis régulièrement de 2 à 10 ans.

Introduction

The incidence of pelvic osteomyelitis is about 10–15% of all skeletal infections [12], although acute osteomyelitis is extremely rare in the absence of any predisposing factors [5]. However, it may follow surgical operations on pelvic organs and urogenital examination with instrumentation [5]. It can also be due to direct extension from a pelvic, intra-abdominal, or retroperitoneal abscess [1]. Haematogenous spread of infection to the pelvis is rare.

In general, osteomyelitis of the pelvis commonly affects the sacroiliac joint and the symphysis pubis [5, 8]. Osteomyelitis of the ilium is rare [7] but may be difficult to diagnose in the acute stage, as pain is deep-seated and may radiate to the thigh or lumbar region. This may lead to unnecessary operations, or drainage of a non-specific inguinal or retroperitoneal abscess [7]. The disease may become chronic as a result of inadequate treatment, and there may then be problems of recurrent infection. Conservative treatment with antibiotics alone, simple surgical debridement of sinuses and scar tissue, or simple drainage of abscess cavities, is often followed by recurrences [3]. Therefore, the aim of this study was to stress the importance of completely removing the diseased portion of an infected iliac crest but leaving a margin of healthy bone.

Material and methods

We studied six healthy young men aged between 14 and 38 years who presented to the Orthopaedic Department of Basrah University with chronic osteomyelitis of the iliac bone. Laboratory investigations included Hb, WBC, ESR, Hb-electrophoresis, blood urea, blood sugar, and bacteriological studies, as well as immunological and serological tests such as tuberculin, Widal, and brucella agglutination. Plain radiographs of the pelvis and both hips were taken, and abdominal and pelvic sonography was used routinely to exclude any collections of pus.

All patients were treated by resection of the infected bone leaving a healthy bleeding margin of at least 3 mm. An antibiotic was given systemically for 2 weeks. The resected specimens were subjected to histopathological examination in order to confirm both the diagnosis and to ensure a healthy margin. The patients were followed for a minimum of 2 years.

Results

None of the patients had any significant medical problems such as immuno-suppression, diabetes, renal failure, sickle cell disease, or an extension from an intra-abdominal or pelvic abscess. The infection involved the left ilium in four patients and the right side in two. In

M. M. Muhdi (✉) · T. A. Hamdam
Basrah Medical College,
P.O. Box 42002 99, Basrah, Iraq
e-mail: mmmad8.b@warkaa.net
Tel.: +964-40-413306; +964-40-219951
Fax: +964-40-219375

Fig. 1a–b Pelvic radiograph of 16-year-old male with haematogenous osteomyelitis in the left iliac wing of 2 years duration. **a** Pre-operatively; **b** post-operatively

three patients, chronic osteomyelitis followed a bullet injury, two were haematogenous (Fig. 1), and one followed removal of bone for grafting. All six patients had undergone several operations including drainage of a soft tissue abscess, or “inadequate” surgery, either for a discharging sinus or removal of necrotic tissue. Almost all the laboratory results were within normal range, except a raised ESR in three patients, and histopathological examination confirmed the diagnosis of pyogenic osteomyelitis.

In three patients, *Escherichia coli* was isolated, probably because they had suffered an associated colonic injury. *Staphylococcus aureus* was responsible for haematogenous osteomyelitis in two patients, and in one patient we could not identify the micro-organism. This was probably due to previous prolonged use of antibiotics. The main radiological finding was of an abscess cavity surrounded by sclerosis in the iliac bone, and this occurred at variable depths.

There was no recurrence of infection within the minimum period of follow-up (2 years).

Discussion

Reports suggest that women are more susceptible than men to suffer pelvic osteomyelitis, particularly involving their pubis and sacroiliac joints, and that the chronicity of their pelvic bone involvement is related to continued infection from the urogenital tract [5]. All our patients were young healthy males, and the site of infection was the iliac bone.

The infecting organisms are usually mixed in pelvic osteomyelitis, although specific types such as salmonella, haemophilus, klebsiella, blastomycosis, fungus, and candida have been reported [1, 2, 5, 10, 11]. In our study, there were three infections with *E. coli* and *S. aureus* was isolated in two patients.

The lack both of clinical awareness and of special investigations such as radioisotope studies, CT, and MRI, which are useful for diagnosing the early stage, was the leading cause of chronicity and recurrence [7, 9]. We also suspect that the lack of experience in performing an adequate surgical clearance may be responsible for the reported high rate of recurrence. Simple radiography of the pelvis helps to clinch the diagnosis, and several views are helpful.

Fortunately, all lesions we studied were surgically resectable, although radical excision may have been required if the lesion was located near the acetabulum or sacroiliac joint [4, 10]. In general, it is essential to remove all necrotic and infected bone and, although the importance of this principle is stressed in the relevant literature, the method of determining the excision margin is not often explained. Many techniques have been used to ascertain whether the bone is alive or dead, and radiological sclerosis may help the determination [6]. We found that the appearance of punctate bleeding (Paprika sign) is very useful, and we also removed bone at least 3 mm away from any areas of sclerosis [13].

The antibiotic regime was limited to a short course of antibiotic delivered parenterally and then orally for a total of 2 weeks. We used neither a prolonged systemic antibiotic course nor local antibiotics, and from this we concluded that the degree of surgical clearance is critical in preventing recurrence. Finally, all our patients had a good systemic and local immune response. This is probably the outcome of excising all infected unhealthy bone and leaving a margin of healthy bleeding bone that allows both a high concentration of antibiotic and encourages good resistance to the infective micro-organism.

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