Osteomyelitis variolosa: a report of two cases

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ABSTRACT

We present 2 patients with osteomyelitis variolosa in both elbow joints—sequelae of smallpox. The condyles were elongated and the central portions of the distal humeri were absorbed and the elbow joints were unstable. One of the patients sustained a closed fracture of the distal humerus. The fracture united uneventfully following stabilisation and bone grafting. At the 13-year follow-up, the patient had satisfactory elbow function.

Key words: osteomyelitis; smallpox; variola virus

INTRODUCTION

Smallpox was eradicated from the world in 1980. Orthopaedic manifestations and sequelae of this disease are largely forgotten. In countries where smallpox was endemic, bone lesions or deformed joints, particularly those of the elbow, may be sequelae of smallpox. We present 2 patients with osteomyelitis variolosa in both elbow joints.

CASE REPORTS

Case 1

In June 1994, a 64-year-old man presented with a closed fracture of the right humeral shaft following a roadside accident. The neurovascular status of the limb was normal. The patient was of short stature. The medial and lateral humeral condyles of both elbows were elongated and prominent, and the central trochlear and capitulum portions were excavated (Fig. 1). The flexors and extensors of both elbows were poorly developed with reduced bulk. There was multidirectional instability in the left elbow; the stability of the fractured right elbow could not be assessed. The flexion-extension arc of the left elbow (and the right elbow before injury) was 10° to 110°.
Deformities were also observed in both feet (Fig. 2). He had deep-pitted scars all over his face and body (Fig. 3). All his deformities had been present since childhood.

The medullary canal of the fractured humerus was narrow and sclerosed. After limited open reduction, the fracture was stabilised with a 3-mm stainless steel malleable ulnar square nail and bone grafts (Fig. 4a). Plating was not performed because of poor soft-tissue cover, as the distal humeral shaft was almost subcutaneous, with marked muscle wasting. The arm was protected in an above-elbow plaster of Paris cast for 2 months until clinicoradiological bone union was achieved. At the 13-year follow-up, bone union was good (Fig. 4b) and the elbow range of movement had

Figure 1 Radiographs showing (a) a fracture of the distal humerus and deformed right elbow joint, (b) the elongated medial and lateral condyles of the left elbow with shallow trochlear and capitulum portion.

Figure 2 Radiographs showing deformities of both feet. The left foot is affected more severely. The ankle joints are shallow, and the left calcaneum is shortened.

Figure 3 Deep-pitted smallpox scars on the face.
been preserved (20°–110°). The patient was not willing to undergo nail-removal surgery.

**Case 2**

In November 2003, a 53-year-old man presented with pain and swelling of the left elbow after falling on his outstretched hand. Radiographs did not reveal any bony injury, but showed laxity of both elbows in mediolateral directions and deformities similar to case 1 (Fig. 5). The radiographic features were sufficiently diagnostic of osteomyelitis variolosa. The range of movement of both elbows was 20° to 120°. No abnormalities were found in other joints. The patient was treated with analgesics and splinting for 3 weeks, followed by mobilisation. He regained his pre-injury status gradually.

**DISCUSSION**

In 1980 the World Health Organization declared that the world was free of smallpox. Nonetheless, sequelae of the disease may occasionally occur in previously endemic countries. During a smallpox epidemic, 0.25 to 0.5% of all patients and 2 to 5% of affected children were expected to have osteoarticular sequelae.

80% of these involved the elbow, 20% the hands and wrists, and 18% the ankles and feet. Variolar involvement of the knees, hips, shoulders, skull, spine, thorax, or pelvis was rare. A review of studies into osteomyelitis variolosa over the past...
Table

Studies on osteomyelitis variolosa in the past 50 years

<table>
<thead>
<tr>
<th>Studies</th>
<th>No. of patients</th>
<th>Elbow involvement</th>
<th>Bones affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cockshott and MacGregor, 1958 &amp; 1959</td>
<td>34</td>
<td>80%</td>
<td>Humerus, radius, ulna, femur, metacarpals, phalanges, carpal bones, tibia,</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>fibula, metatarsals, tarsal bones, facial bones</td>
</tr>
<tr>
<td>Davidson and Bulawayo, 1963</td>
<td>82</td>
<td>Unknown</td>
<td>Humerus, radius, ulna, tibia, fibula, metacarpals, phalanges</td>
</tr>
<tr>
<td>Jaffari and Hussain, 1969</td>
<td>31</td>
<td>61%</td>
<td>Humerus, radius, ulna, tibia, fibula, femur, calcaneum</td>
</tr>
<tr>
<td>Mohindra and Tuli, 1969</td>
<td>1</td>
<td>100%</td>
<td>Humerus, radius, ulna, metacarpals, phalanges, tibia</td>
</tr>
<tr>
<td>Gupta and Srivastava, 1973</td>
<td>20</td>
<td>75%</td>
<td>Humerus, radius, ulna, tibia, fibula, femur, patella, metacarpals, phalanges,</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>thoracic spine, pelvis</td>
</tr>
<tr>
<td>Nathan and Nguyen-Buu-Trung, 1974</td>
<td>1</td>
<td>100%</td>
<td>Humerus, radius, ulna, metacarpals, phalanges, tibia, fibula, calcaneum</td>
</tr>
<tr>
<td>Lentz and Noyes, 1979</td>
<td>1</td>
<td>100%</td>
<td>Humerus, radius, ulna, phalanges, metatarsals, talus, cuneiforms</td>
</tr>
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</table>

50 years shows a predominant involvement of the elbow joint (Table). The reason for this predilection for the elbow is not known. It is hypothesised that high stresses in the joint predispose it to localisation during vireaemia.

The differential diagnosis includes achondroplasia, pseudohypothyroidism, sequelae of bacterial septic arthritis, chronic burns, leprosy, and congenital dysplasias. Bilateral elbow joint involvement affecting all 3 bones is rarely seen in simple pyogenic osteomyelitis. The joints can be subluxated, flail, ankylosed, dislocated or show precocious osteoarthritis. The bones can be irregular, sclerosed or thickened. Deformity and irregularity of short tubular bones, and fracture of the deformed medial condyle have been reported. Enquiry for a history of smallpox is suggested when obscure joint deformities and growth inequalities of the extremities are seen. Despite distortion of the medullary structure, the fractured bones tend to heal normally.

REFERENCES