THE PRODUCTION OF A ONE-BONE FOREARM AS A SALVAGE PROCEDURE AFTER HAEMATOGENOUS OSTEOMYELITIS

A CASE REPORT

IZHAR-UL-HAQUE

From the University Teaching Hospital, Lusaka

A child with almost total loss of the radius from injudicious diaphysial sequestrectomy after acute haematogenous osteomyelitis developed a severe radial club hand and loss of function. She was admitted to the University Teaching Hospital, Lusaka, where the ulna was “radialised” producing a one-bone forearm and a stable and functional limb. This unusual case is reported to discourage premature diaphysial sequestrectomy and to describe a method of salvage which gave gratifying results.

It is generally agreed that in acute haematogenous osteomyelitis diaphysial sequestrectomy should not be undertaken until living bone is clearly demarcated from dead bone and the involucrum appears able to maintain the length and strength of the bone (Huckstep 1968). This paper describes an uncommon and totally avoidable complication arising as a direct result of ignoring the above principle: unwarranted diaphysial sequestrectomy led to almost total loss of the radius and a radial club hand.

CASE REPORT

A four-year-old girl was admitted to a district hospital in Zambia in April 1978 with a history of swelling of the left forearm and pyrexia of 10 days’ duration. Clinical and radiological examination confirmed a large abscess and a periosteal reaction of the distal radius. A diagnosis of acute haematogenous osteomyelitis was made and the abscess was drained under antibiotic cover. Progressive osteomyelitis resulted in total diaphysial sequestration of the radius. Without exercising patience and waiting for the formation of an involucrum, premature sequestrec-
tomy was performed 11 weeks after the onset of the infection. This produced almost total loss of the radius including the distal radial epiphysis, which was followed by progressive deformity resulting in a radial club hand, an unstable wrist and loss of function (Figs 1 to 3). The patient was then referred to the University Teaching Hospital, Lusaka, in June 1979. On admission the deformity was gross although the sinus had healed. There was no radiological evidence of any regeneration of the radial diaphysis.

Reconstructive surgery was planned with two objectives: the restoration of stability and function at the wrist and the correction of the unsightly deformity. Under general anaesthesia and with a pneumatic tourniquet applied to the arm, the distal ulna and the wrist joint were exposed through a dorsomedial approach. The distal ulna was then mobilised and shifted to the centre of the wrist joint, so as to create a one-bone forearm. As there was gross deformity and overgrowth of the distal ulna, it could only be accommodated by sacrificing the proximal row of the carpus. In its new position the stability of the ulna appeared adequate and fixation with a Kirschner wire to the carpometacarpal bones was found to be unnecessary. A plaster-of-Paris backslab was applied with the forearm in mid-prone position. Postoperative pyrexia settled in 72 hours and all wounds healed by first intention. After removal of the stitches the arm was put in a complete plaster cast.

Six weeks after the operation, the plaster cast was removed. Clinical and radiological examination confirmed the stability of the distal ulna. Physiotherapy was then started to promote active movements at the wrist and to improve hand function. The mother was requested to encourage the child to use the hand and the patient was discharged home after two months.

The child was reviewed regularly as an outpatient. After two years the wrist showed consistent stability with an acceptable degree of active flexion and extension and the child had the ability to handle small and large objects; she was free of pain and the limb was cosmetically satisfactory (Figs 4 and 5). Radiologically, the lower end of the ulna with its fused epiphysis showed a progressive change of shape, confirming its changing function (Figs 6 and 7).

I. U. Haque, FRCS.Ed, Consultant Orthopaedic Surgeon
University Teaching Hospital, P.O. Box 50110, Lusaka, Zambia.
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DISCUSSION
Most authors agree that diaphysial sequestrectomy before the formation of an adequate involucrum is undesirable (Griffiths 1968; Huckstep 1968). When the formation of the involucrum is slow, patience should be exercised to avoid such a serious complication. In the absence of the distal radius a radial club hand is a recognised complication, especially when there has been inadequate splintage and physiotherapy. In osteomyelitis, regeneration of a defect is rare (Bosworth et al. 1966), although regeneration after traumatic diaphysial extrusion of forearm bones has been reported (Varma and Srivastava 1979).

Total loss of the diaphysis of the radius in a child presents a serious challenge to the reconstructive surgeon. There are scattered reports of the production of a one-bone forearm since 1921 when Hey Groves described a patient with a large radial defect which was managed by transplanting the ulna into the distal segment of the radius. Since then occasional reports of a one-bone forearm have been documented, mostly for partial loss of the ulna and occasionally for segmental loss of the radius after resection of a tumour, injury, osteomyelitis or war wounds. The functional results after the loss of the ulna have been good, provided the forearm is in the neutral position, with no supination or pronation (Lowe 1963; Reid and Baker 1973; Castle 1974).

To the author’s knowledge, there is no comparable report of reconstruction after almost total loss of the radius in a child as a result of acute haematogenous osteomyelitis. The salvage procedure described here cannot be compared with the operations for congenital absence of the radius on account of other developmental problems associated with that deformity. A functional and stable wrist produced in the non-dominant arm was considered worthwhile, and the cosmetic result was gratifying.

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REFERENCES
Hey Groves EW. On modern methods of treating fractures. 2nd ed. Bristol: John Wright & Sons Ltd, 1921: 320.