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Single-Bone Forearm Salvage Procedure for a Child with Acquired Radial Clubhand in a Resource Limited Centre: A Case Report

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ABSTRACT

Acquired radial clubhand deformity can be a consequence of large bone gap left by premature extensive radius osteomyelitis sequestrectomy. Single-bone forearm reconstruction is a salvage procedure when other motion-preserving techniques are not feasible. Here we present a child who developed radial clubhand deformity after an untimely sequestrectomy of radius diaphysis. In view of limited microsurgical expertise in our centre, single-bone forearm procedure was done utilising simple Kirshner wires to achieve radio-ulnar fusion. The procedure resulted in pain-free stable wrist, restoration of hand function and improved cosmesis.

Key Words:
radius, hand, deformities, acquired, forearm, reconstruction procedure

INTRODUCTION

Acquired radial clubhand deformity can be a consequence of overenthusiastic radius osteomyelitis diaphysectomy[1]. Single-bone forearm is a salvage procedure when motion-preserving method is not possible, especially for large radial defect but with intact distal radius[2]. Simple Kirschner wires can be utilised to achieve radioulnar fusion in resource-limited setting. Centres with available expertise reported successful single-bone forearm procedure with distraction osteogenesis and vascularised fibular graft methods[3,4].

CASE REPORT

A 9 year-old male child was referred to us for right radial clubhand-like deformity and limitation in performing daily activities. He was forced to modify his hand dexterity due to weak grip and pinch strength. He had previous history of extensive radius osteomyelitis that was treated by sequestrectomy. As a result of the extensive sequestrectomy, the child developed manus valgus deformity.

Examination revealed no signs of infection in the forearm. His right wrist was deviated 60 degrees radially (Fig. 1). The forearm was pronated 90 degrees. Ulnar head was prominent. Grip and wrist strength were markedly reduced. Forearm rotation was absent. Wrist dorsiflexion and palmar flexion were restricted to approximately 0 to 10 degrees. There was no neurovascular impairment. He had full range of elbow and hand movements.

Pre-operative radiographs (Fig. 1) revealed remnant distal radial epiphysis with intact distal radial physeal plate and part of the metaphysis. The distal radioulnar joint was dislocated and the radial head was hypoplastic. There was ulna overgrowth and bowing. Blood investigations including white cell count, erythrocyte sendimentation rate and C-reactive protein confirmed the absence of active infection. Taking into account the child's extensive radial loss and the available surgical expertise in our centre, the patient was offered single-bone forearm salvage procedure.

The patient was operated under general anaesthesia, in a supine position, with the forearm on a radiolucent table. An incision was made over the previous scar on the dorsal aspect of the forearm. The distal right radius and ulna were approached through the same incision. Radial metaphyseal end was freshened until bleeding. The right ulna was osteotomised at the level corresponding to the remaining right radius epiphysis. As there was overgrowth of the ulna, it was impossible to reduce the distal radio-ulnar joint without sacrificing 2cm of the ulna shaft. Care was also taken to avoid excessive ulna shortening, as this would cause loss of tendon tension. The distal radius was moved ulnar-

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