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Case Report

Acquired Manus Valgus: A Difficult Problem with a Simple Solution

後天性橈側球棒手:用簡單的辦法去解決困難的問題

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ABSTRACT

Acquired manus valgus or acquired radial-club hand deformity of the wrist is an uncommon entity. Pathological destruction of the distal radius, following infection, trauma, or tumorous conditions in the paediatric population, often leads to radial shortening, ulnar lengthening and angulation, distal radio-ulnar joint dislocation, and radial deviation of the wrist. We report a case of acquired manus valgus treated by centralisation of the ulna on the wrist. At the 2-year follow-up, the patient had a functional, stable, and cosmetically acceptable wrist, with radiographic evidence of ulnocarpal fusion. It is an easy to perform, cost-effective surgery.

中文摘要

後天性橈側球棒手是一種罕見的手部畸形。病理性的橈骨遠端破壞，感染，外傷，或在兒童時的腫瘤，往往導致橈骨短縮，尺骨延長和成角，尺橈關節脫位和手腕的橈偏。我們報告一個利用尺骨置中手術來治療後天性橈側球棒手的病例。兩年後的隨訪，發現患者有功能齊全，穩定和外觀可接受的手腕，而影像顯示尺腕關節融合良好。這是一個容易執行，符合成本效益的手術。

Introduction

Acquired manus valgus or acquired radial-club hand deformity of the wrist is an uncommon entity. Pathological destruction of the distal radius, following infection, trauma, or tumorous conditions in the paediatric population, often leads to radial shortening, ulnar lengthening and angulation, distal radioulnar joint dislocation, and radial deviation of the wrist.^{1,2}

This deformity poses a difficult and challenging problem for the treating surgeon. We report a case of acquired manus valgus treated by centralisation of the ulna on the wrist.

Case report

A 7-year-old boy presented with a history of falling on an outstretched hand while playing in December 2008, and sustained injury around his left wrist. The patient was primarily treated by an osteopath/traditional bone-setter. There was no history of fever. At 6 months after the injury, the patient underwent an incision and drainage procedure around the left distal forearm. An X-ray at that

stage showed distal radial epiphyseal separation. He subsequently had sequestration of the left distal radius with osteomyelitic changes in the ulna. Thereafter, the patient gave a history that the sequestrum came out of the forearm by itself.

The patient presented to us in August 2009 with radial deviation of the left (nondominant) wrist, and scars over the dorsolateral aspect of the distal forearm, and the wrist had healed by secondary intention. Movements of the wrist were grossly restricted, with only wrist jogging motion being present. A clinicoradiological diagnosis of postinfective manus valgus of the left wrist with a gap nonunion left distal-third radius was made (Figure 1).

Reconstructive surgery for deformity correction and stabilisation of the wrist was performed. Under general anaesthesia and with a pneumatic tourniquet applied to the arm, the ulna and wrist were exposed using separate dorsomedial and lateral longitudinal incisions. The lower end of the ulna was cut to remove the cartilaginous physis. A slot in the lunate was made and the lower end of the ulna was impaled into the lunate. The distal ulna was mobilised and stabilised with a Kirschner wire, keeping the wrist in a functional position, after deformity correction. A portion of the distal ulna and proximal carpal row were sacrificed prior to the ulnocarpal fusion. A plaster of Paris above-elbow posterior slab was applied in the midprone position. Strict limb elevation and active finger movements were advised for

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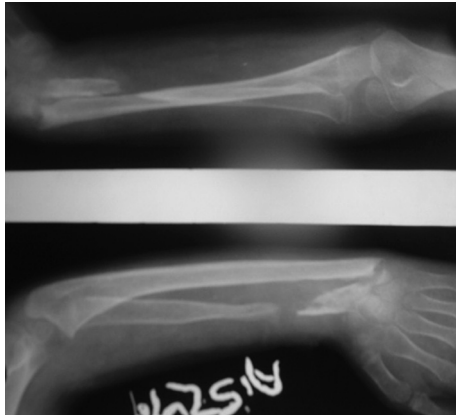


Figure 1. Radiograph showing gap nonunion of the distal radius, with radial deviation of the wrist and hand.

the initial 48 hours. The stitch removal was done at 2 weeks and then an above-elbow cast was applied and the patient was discharged.

The area of ulnocarpal fusion showed sclerosis even at 9 months follow-up. The patient was advised bone grafting at the proposed fusion site. However, due to personal reasons, he could not undergo surgery. He was advised to continue with the below-elbow splint until surgery, which was deferred by 3 months. On his subsequent visit, a sound ulnocarpal fusion had occurred (Figure 2).

The patient was regularly reviewed outdoors. At 2 years' follow-up, the patient had a good hand grip after postoperative rehabilitation. However, the forearm was fixed in the midprone position. He is able to perform good function with his hand and has achieved a painless, stable, and cosmetically acceptable wrist. Radiographs also showed ulnocarpal fusion with wrist remodelling (Figure 3).

Discussion

Acquired manus valgus of the wrist, following haematogenous osteomyelitis of the radius is an uncommon problem. Surgical correction/reconstruction of this deformity is also challenging.

Various treatment methods have been described. Cancellous bone grafting with plating, ulnar shortening, callus distraction using monolateral external fixator, and distraction using Ilizarov apparatus, have been commonly practiced options.^{2–5}



Figure 2. Radiograph at 2 years follow-up showing sound ulnocarpal fusion.



Figure 3. Clinical photographs of the patient at the 2-year follow-up, showing functional and cosmetic results of the left upper extremity, following deformity correction and ulnocarpal fusion.

Malki et al⁶ reported a case of infected nonunion radius with bone loss that was treated by a modified Hey–Groves procedure. They preserved the lower end of the ulna with its triangular fibrocartilage complex, so that the stability of the wrist could be retained. The patient achieved a cosmetically and functionally acceptable wrist.

Recently, correction of this radial club-hand-like deformity has been described using Ilizarov ring or monolateral external fixators. In 2005, Hosny⁷ described the technique of forearm lengthening using the Ilizarov technique in 11 patients with forearm shortening of different aetiology. He achieved good results in eight patients. Complications such as pin-tract infection were seen in all of the patients.

Zhang et al⁵ have reported their experience of using callus distraction technique with monolateral external fixator for the treatment of acquired radial club-hand-like deformity in 13 patients. They achieved satisfactory outcome in all of the patients.

Both Ilizarov and monolateral external fixator are valid options for the correction of acquired manus valgus deformity. However, they require lengthy follow-up and strict compliance on the part of the patient. They also involve extra gadgets that add to the cost of treatment.

In our case, we performed centralisation of the ulna and ulnocarpal fusion to treat the acquired manus valgus deformity of the wrist following osteomyelitis. At 2 years follow-up, the patient has a functional, stable, and cosmetically acceptable wrist, with radiographic evidence of ulnocarpal fusion. It is an easy to perform, cost-effective surgery that can even be performed in a resource-constrained setup, especially in developing countries.

Conflicts of interest

The authors declare that they have no financial or non-financial conflicts of interest related to the subject matter or materials discussed in the manuscript.

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