Kapandjii's Procedure in a Former Far Eastern Prisoner of War with Poliomyelitis of the Affected Limb

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SUMMARY: A case of traumatic radio-ulnar dislocation in a limb previously affected by poliomyelitis is presented. Treatment with Kapandjii's procedure is described and discussed.

Case Report

A 73 year old retired former Battle of Britain pilot was referred with a 3 month history of a painful right wrist. He had a concomitant inability to rotate his forearm and a prominent lump over the "back of his wrist", following a fall. His injuries had initially been investigated at another hospital, but a distal radio-ulnar dislocation had been missed.

He had been invalided out of the Air Force in 1948 because of poliomyelitis affecting the right upper limb. Prior to his recent injury, he had been, despite his handicap, able to use his right hand for many tasks, including playing the piano.

Examination revealed inability to actively extend the fingers and correspondingly impaired power of wrist dorsiflexion. There was a tender prominence over the volar aspect of the ulnar side of the wrist. Supination was 30 degrees deficient as a result of pain and stiffness. X-rays showed a volar dislocation of the Distal Radio-Ulnar Joint (Fig. 1). Image Intensifier Screening demonstrated movement at this dislocated joint, suggesting that the disruption was relatively recent.

Closed reduction proved impossible so, in order to restore forearm rotation, a Kapandjii procedure was carried out. He was discharged in a forearm cast for 6 weeks, carrying out active and passive rotation while in the cast.

At 6 months his pain had disappeared, he had full supination, 60 degrees of pronation, and 45 degrees of both dorsal and palmar flexion. Subjectively he described a decreased span when playing the piano, compared with his pre-injury state. Somewhat more worryingly he described increased wasting of his right hand, and examination showed gross wasting of the hypothenar, interossei and adductor pollicis muscles. X-ray showed that the Radio-Ulnar synostosis was healed (Fig. 2).

It was felt that the residual ulnar nerve symptoms were as a result of the prolonged pressure of the volarly

dislocated ulnar head, and that perhaps the muscles previously affected by polio were both more vulnerable to the effects of a neuropathy and slower to recover. It was hoped that further improvement would occur in time.

Discussion

Traditionally excision of the ulnar head is the treatment for distal radio-ulnar joint disorders (Darrach 1913), indeed this procedure is still widely used with good results reported (1). Despite this, it is felt to have shortcomings in patients who are active and who have anything more than the most minimal of expectations (2,3,4).

Kapandjii's procedure (5) involves firstly arthrodesis of the distal radio-ulnar joint using cancellous screw. This may necessitate the resection of bone from the ulna neck to allow accurate reduction. Once this has been achieved, further resection of 15-20 mm of the ulnar neck, leaving 25-30 mm of distal ulna, is carried out. Then a piece of muscle taking origin from the ulna (pronator quadratus, or one of the flexors or extensors) is inserted between the two ulnar ends. This allows for forearm rotation around the pseudoarthrosis in the ulnar shaft.

This operation has been shown to give excellent results (6), with a recovery of 84% of grip strength, full forearm rotation, and 85% of wrist flexion-extension, compared with the contralateral wrist. It is superior to Darrach's procedure in that it maintains ulnar support for the carpal, allowing transmitted forces to be shared between the distal radius and the ulnar head, preventing ulnar migration of the proximal carpi. The extensor carpi ulnaris tendon retains its stability across the back of the ulnar head, avoiding painful subluxation over the cut end of the ulna in pronation and supination (7). Pain at the distal radio-ulnar joint and ulnar-carpal abutment are eliminated by accurate arthrodesis.

Pain and a sensation of insecurity caused by a mobile distal ulna have been reported in a small number

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Fig 1. Pre-operative X-rays showing volar dislocation of the distal radial ulnar joint.

Fig 2. Postoperative X-ray.

patients (6).

We commend the Kapandjii procedure for the treatment of distal radio-ulnar joint pathology in the non Rheumatoid patient. It allows restoration of forearm rotation and relief of pain with good function in the majority of patients.

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