Traumatic Extensor Hood Rupture

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Abstract We report a traumatic rupture of the extensor hood of the dominant middle finger in an elite boxer. Surgical repair of the extensor hood with the metacarpophalangeal joint (MCPJ) in 90° of flexion and immobilisation of the MCPJ in flexion for 4 weeks allowed successful return of function to an international level.

Keywords Metacarpophalangeal joint · Extensor hood · Boxer's knuckle

Introduction

Extensor hood rupture is a rare injury associated with boxing and other professional sports [6]. We report a case of an elite boxer with an extensor hood injury treated by surgery. The principles of surgical repair and postoperative rehabilitation of this injury is discussed.

Case Report

A 20-year-old British male right hand dominant light heavyweight elite boxer developed pain on the dorsal side of

his MCPJ following a punch during a fight. Despite the immediate pain he fought on. Two weeks after the fight, his injured metacarpophalangeal joint (MCPJ) was injected with 4 mg of triamcinolone, with no symptomatic improvement.

He continued with pain and was referred to our service with pain over the MCPJ, which was limiting his punching. Clinical examination revealed a swollen middle finger MCPJ, with obvious radial subluxation of the extensor digitorum communis of the middle finger, which was most apparent on flexion. The tendon spontaneously relocated on finger extension.

Radiographs exposed no bony injury. A magnetic resonance imaging (MRI) arthrogram of his MCPJ revealed a longitudinal split in the ulnar extensor hood and also in the joint capsule with marked extravasation of contrast (Fig. 1). He underwent open exploration, debridement and repair of the extensor hood and capsule (Fig. 2). The skin incision utilised for boxers is a longitudinal curved incision that avoids a scar directly over the metacarpal head. The repair was undertaken by cross-stitch technique using a 3/0 polydioxanone suture with the MCPJ in 90° flexion. He was immobilised with the MCPJ in 90° flexion and interphalangeal joints (IP) extended for 4 weeks. He was then allowed free active mobilisation.

Four months following surgery, he achieved full flexion and extension of his MCPJ, which was pain-free. The extensor tendon was central throughout the range of motion. Five months post-surgery, tenderness prevented punching and then he continued with hand and forearm strengthening using squeeze balls, finger bands and free weights. Water-bag punching was reintroduced at 9 months and was increased to heavier water bags in a step-wise manner over a month. Ten months following surgery sparing was introduced. At 12 months he returned to the

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Figure 1 MRI arthrogram—longitudinal split of ulnar extensor hood and capsule.

highest level of international amateur boxing and fought successfully, earning a bronze medal, in the 2008 Olympic games in Beijing.

Discussion

Extensor tendon rupture has been described secondary to trauma [7], inflammatory arthropathies [4] and steroid injection [3]. In boxing, blunt trauma is usually the cause [2]. We have described a case of an elite boxer who developed extensor hood rupture following an acute injury.

Figure 2 Repair of ulnar extensor hood and capsule.

Several previous studies of extensor hood rupture have looked at the outcome of extensor hood repair and suggest that surgery gives favourable outcome compared to non-operative treatment. Their results are summarised in Table 1 [1, 2, 6, 7].

General surgical and rehabilitation principles must be taken into consideration when treating extensor hood rupture in the professional boxer. The location of the surgical incision is vital in our case. The surgical incision was made dorsally on the ulnar side of the metacarpal head, rather than directly over the MCPJ. This was done to minimise the possibility of a tender scar, which could impair punching.

In managing extensor hood rupture, potential complications must be anticipated and taken into account. In a boxer MCPJ stiffness in extension would be very limiting. To avoid that, we performed the repair of the extensor hood with the MCPJ in 90° flexion. In this way the extensor hood was tight in flexion and loose in extension. If stiffness occurred it would be with the MCPJ in flexion, a functional position for boxing. Finally, a variation of the safe position also known as the Edinburgh position [5] was utilised for immobilisation. For 4 weeks, the MCPJ were placed in 90° flexion with the proximal IP joints in full extension. This position avoids potential shortening, stiffness and contracture which could be career ending in an elite boxer. In this position the MCPJ collateral ligaments and the IP joint collateral ligaments and palmar capsule are tight. Again, this would be to ensure a functional position if stiffness did occur.

Table 1 Summary of treatment and rehabilitation of previous published studies of extensor hood repair.

Author	Cases	Average age	Management	Rehabilitation	Outcome
Arai et al. [1]	16	33	8 conservative; 8 surgical	Immobilisation in extension for 3–4 weeks	All eventually needed capsule and hood repair
Bents et al. [2]	1	20	Capsule and hood repaired	Immobilisation in flexion for 6 weeks	Successful return to sport (all)
Hame et al. [6]	11	20–28	Extensor hood repaired	60–70° flexion, 6 weeks, active flexion not extension of interphalangeal joints allowed, first 6 weeks	Successful return to sport (all)
Posner et al. [7]	8	23.8	Capsule and hood repaired	60°+ flexion, 3–4 weeks; dynamic splints, 7–8 weeks post op; no punching, 6 months	Successful return to sport (all), alleviation of pain in non-sportsman

Summary

Our case demonstrates that if certain surgical and rehabilitation principles are applied, boxers can return to the highest level of competition following extensor hood rupture.

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