

Extensor tendon rupture associated with Smith's fracture

A case report

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A 14-year-old boy sustained closed rupture of the extensor digitorum communis, extensor pollicis longus, and extensor indicis proprius tendons following a volarly displaced Salter-Harris Type II fracture of the distal end of the radius. The condition was treated with tendon grafts, but some limitation of metacarpophalangeal flexion remained.

Case report

A 14-year old schoolboy sustained a Salter-Harris Type II fracture with volar displacement of the distal radius during a horizontal bar gymnastic exercise; forced hyperflexion was applied to his right wrist. A greenstick fracture of the lower end of the ulna and an avulsed styloid process of the ulna were also seen (Figure 1). Closed reduction was performed followed by 6 weeks of cast immobilization. After removal of the cast, he was unable to extend the metacarpophalangeal joints of his index, middle, and ring fingers. He was able to extend his thumb when the wrist was held in a neutral position, but not when the wrist was extended.

Surgical exploration was performed 3 months after the injury. Complete rupture of the extensor digitorum communis and extensor indicis proprius tendons was found without any tendinous portions at the proximal side. The long thumb extensor tendon was found to be trapped at the fracture site and completely frayed. The extensor digiti minimi tendon was intact. Tendon grafting was performed using the palmaris longus and plantaris tendons.

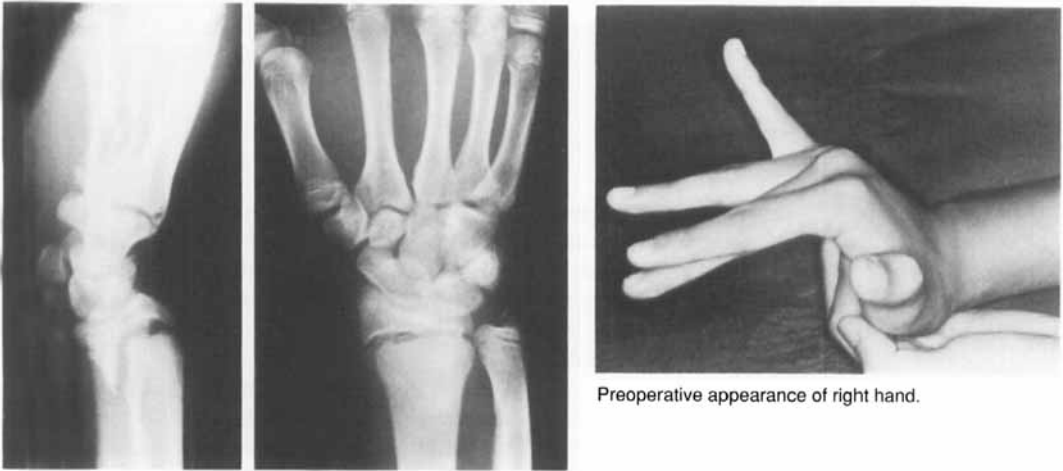
On examination 2 years after the operation, the boy had normal motion of his thumb and complete extension of his second through fifth fingers, but flexion of the metacarpophalangeal joint of these fingers was limited to 60° when the wrist was held in a neutral position.

Discussion

Several reports have mentioned the entrapment of the extensor pollicis longus tendon associated with Smith's fracture (Hunt 1969, Morrissy and Nalebuff 1977, Murakami and Todani 1981). As a mechanism of the entrapment, Hunt (1969) emphasized the pronation force of the distal fragment. Thomas and Kershaw (1988) reported entrapment of the extensor digitorum communis tendons associated with Smith's fracture. Mackay and Simpson (1980) first reported rupture of the extensor tendons associated with Smith's fracture. They transferred the abductor pollicis longus tendon to the finger extensors with satisfactory results. Itoh et al. (1987) described 3 cases of extensor tendon involvement associated with Smith's fracture. In these, 2 cases had entrapment only and 1 case had a rupture. Rupture of the extensor pollicis longus tendon associated with Colles' fracture occurs late and mostly in nondisplaced fractures (Kwedard and Mitchell 1940, Smith 1946, Trevor 1950). Trevor (1950) emphasized avascular necrosis as the cause of the tendon rupture. In Smith's fracture the mechanism of the tendon rupture is quite different: the muscular tendon unit is stretched during extreme wrist flexion, and the sharp dorsal edge of the proximal fragment may tear the tendon or it may be entrapped in the fracture.

References

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Smith's fracture of the distal radius 2 weeks after injury.

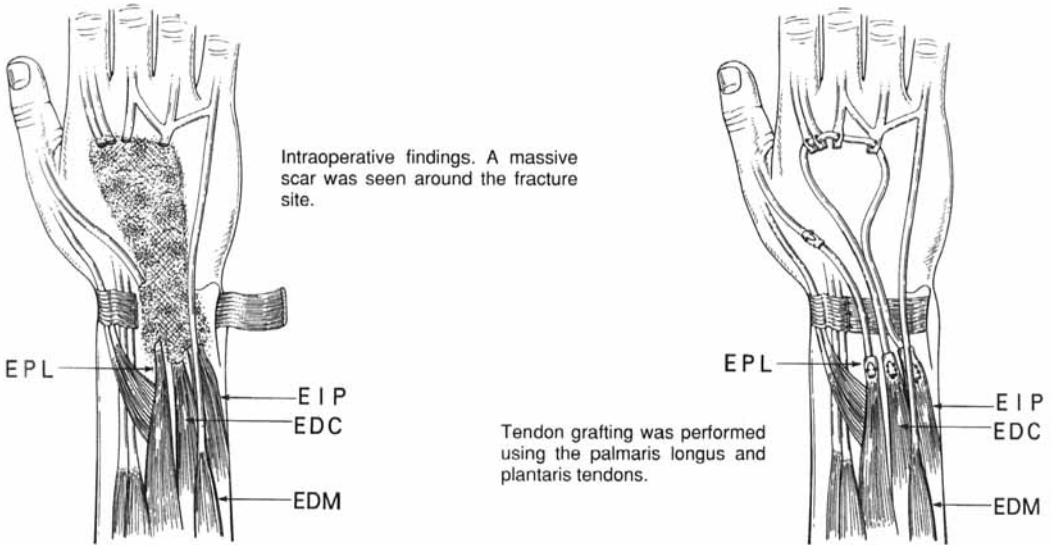


Figure 1. A 14-year-old boy with closed extensor tendon ruptures after Smith's fracture.

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