



Late rupture of Flexor Pollicis Longus tendon 10 years after volar buttress plate fixation of a distal radius fracture : A case report

Maureen K. MONDA, Allun ELLIS, Shuaib KARMANI

From Brighton and Sussex University Hospitals. Brighton, United Kingdom

We report the case of a complete rupture of flexor pollicis longus tendon in a 30-year old-man 10 years after open reduction and internal fixation of a distal radius fracture with a volar buttress plate.

Keywords : distal radius fracture ; buttress plate ; late tendon rupture.

INTRODUCTION

Open reduction and internal fixation of distal radius fractures is undertaken for unstable and intra-articular fractures. This can be either via dorsal or volar plating or sandwich plating. Dorsal plating is associated with a high incidence of extensor tendon irritation and rupture leading to early removal of metal work (2). Flexor tendon rupture as a result of volar plating of the distal radius is rare. To date there have been in literature 13 case reports of rupture of the flexor pollicis longus (FPL) tendon after volar plating. Several reasons have been mentioned for this, including malpositioning of the plates (1), prominent screw heads (2), poor plate designs (7), physiological disposition of the tendon to rupture due to chronic steroid use (1). We report a case of delayed flexor pollicis tendon rupture not attributable to the above.

CASE REPORT

A 30-year-old man attended our Accident and Emergency department with a one-day history of suddenly being unable to flex the interphalangeal joint of his right thumb. This had come on while he was wringing his hand while washing them. He was a right hand dominant carpenter. He stated that, 10 years earlier, he had a fracture to his distal radius in the affected hand. This was treated operatively in another institution with a volar buttress plate to his distal radius. He denied any symptoms preceding the recent event to his right thumb. He was otherwise fit and well. He was a non-smoker and was not taking any regular medication.

- Maureen K. Monda, MD, Specialty Registrar Orthopaedics.
- Allun Ellis, MD, Senior House Officer Orthopaedics.
- Shuaib Karmani, MD, Consultant Orthopaedics.

Department of Trauma and Orthopaedics, Brighton and Sussex University Hospitals, Royal Sussex County Hospitals NHS Foundation Trust, Brighton, U.K.

Correspondence : Maureen K. Monda, Department of Trauma and Orthopaedics, Brighton and Sussex University Hospitals, Royal Sussex County Hospitals NHS Foundation Trust, Eastern Road, Brighton, BN2 5BE, U.K.

E-mail : mmonda87@yahoo.co.uk

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Fig. 1. — AP and lateral radiographs of the right wrist showing the buttress plate implanted 10 years earlier. The distal radius fracture has healed with a 10° dorsal angulation.

On examination, he was unable to flex the interphalangeal joint of his right thumb. Abduction, adduction and extension at the thumb were unaffected. He had full pronation and supination at his wrist. Sensation was normal. His previous surgical scar was well healed. He did however have a mild swelling adjacent to the radial side of his scar and proximal to the distal wrist crease.

Radiographs (fig 1) showed a well-placed volar buttress plate and well healed distal radius fracture with good bone stock ; the fracture had healed with a 10° dorsal angulation of the distal fragment. The plate was not malpositioned, there was no evidence of plate lift off, neither were the screw heads prominent. There was also a non-united ulnar styloid fracture.

Ultrasound scan confirmed a flexor pollicis tendon rupture. He went on to have an exploration

which showed rupture of his FPL tendon at the wrist and he underwent direct repair of his tendon.

DISCUSSION

Flexor tendon ruptures as a result of distal radius fractures/Colles fractures are less common than extensor tendon ruptures. Pronator quadratus muscle which lies volar to the distal radius, together with distal radius anatomy of the pronator fossae protects the flexor tendons from damage by bony spikes or metal work at the fracture site by reducing cortical/metal work contact (4,5,7-9). In most of these cases the mechanism implied is friction with resulting attrition rupture of the tendon.

Drobetz *et al* in their series had a 10% rupture rate of FPL (2). They suggested that rupture of this tendon after fixation with a volar locking plate was

multifactorial. They attributed this to the sharp edges of the cross-split screws used, abrasion caused by prominence of the screw heads and the ridged coating of the plate used. They also felt the intra-operative trauma and the trauma itself were contributory as well. They suggested routinely removing these plates at 4 months (2).

Fuller described a case of delayed rupture at 5 years due to attrition rupture at the free edge of an Ellis plate placed obliquely at the fracture site (3).

Bell *et al* reported 4 cases of FPL rupture after volar buttress plating. In all 4 cases, the tendon had ruptured over the prominent distal edge of the plate. This was either due to the plate being placed too distally, or the fracture collapsing and making the plate prominent as a result. In their case series all their patients were on steroid therapy and were middle aged (1).

Roberts *et al* described FPL rupture in a 17-year-old boy treated with manipulation and plaster immobilisation (7).

There have been case reports of FPL rupture in tendons physiologically pre-disposed to rupture (1), with commercially available plates placed too distally or becoming prominent after radial fracture collapse (3). In most of these cases the delayed presentation has been between 4-10 months with one case reporting delayed rupture at 5 years (3). In all these cases the age range was in the 50's and some of the patients were smokers.

To our knowledge there are no case reports of delayed rupture in otherwise young, fit and healthy patients 10 years after fixation with a volar buttress plate. In our case, review of the radiographs showed no prominence of the plate over the distal radius. Additionally, the screw heads were flush with the plate. Radiologically, the radial fracture appeared to have healed, however the distal fragment was in a malunited position with 10° of dorsal angulation.

It is likely that rupture of flexor pollicis longus tendon in this case was due to attrition as a result of mechanical stress and chronic inflammation due to the malunited distal radial fragment. As increasing numbers of distal radial fractures are now treated with volar locking plates, accurate reduction of radial fracture fragments is important to prevent attrition rupture of tendons. As late rupture of flexor tendons is increasingly identified due to volar plate fixation of distal radius fractures, early removal of metal work should be considered.

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