

**Delayed rupture of Extensor Pollicis Longus Tendon following distal radius fracture in a young patient.**

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Theme

Delayed rupture of extensor pollicis longus(EPL) is a known complication of distal radius fracture<sup>1</sup>. We present a case report in a 16 year old who may be the youngest patient to have been reported.

Case  
presentation

A right hand dominant 16-year-old male suffered bilateral distal radius fracture after a motorbike accident. This involved falling forward onto both hands while travelling at approximately 35 mph. There was no loss of consciousness. He had sustained bilateral extra-articular displaced fractures of distal radius, the displacement worse on the left (figures 1 & 2). There were no neurovascular deficits. Manipulation under anaesthesia was carried out, followed by stabilisation with plaster casts. Post manipulation check x-rays revealed satisfactory reduction. He was discharged on day 2 and reviewed in outpatients at 1, 2 and 4 weeks. The fractures were stable and appeared to be well reduced with no complications. When reviewed at 8 weeks he mentioned inability to extend the distal phalanx of his left thumb, which was noticed a few days earlier. There was no history of further trauma. Clinical examination revealed loss of extension of the distal phalanx of left thumb suggesting a rupture of extensor pollicis longus (EPL). The tendon was intact on the right side.



Fig. 1



fig. 2

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**Discussion**

Delayed rupture of EPL has been a known complication of distal radius fractures often occurring with minimally displaced fractures<sup>1</sup>. It is also associated with chronic tenosynovitis and rheumatoid arthritis. This was first reported in 1876<sup>2</sup>. The two most accepted theories of the aetiology are the vascular damage and mechanical damage theories<sup>3</sup>.

The mechanical theory proposes that rupture of the EPL tendon occurs after damage to it from the callus or the sharp ends of the fractured bone<sup>4,5</sup>. Even in a minimally displaced fracture the intact extensor retinaculum holds the tendon against the callus. This causes increased friction and the resulting inflammation destroys the lubricating glycoproteins, hyaluronan and lubricin. Thus mechanical damage compromises the integrity of the tendon causing an attrition rupture<sup>4</sup>. One study has shown the gliding resistance of EPL to be the highest compared to the extensor tendons<sup>6</sup>. The tendon changes direction around Lister's tubercle, which acts as a pulley aiding the transfer of force from the muscle belly to thumb<sup>6</sup>. The friction is highest around this point, which is a common site for tendon rupture. When some researchers used avascular grafts to bridge the tendon gaps they did not rupture, leading them to conclude that the aetiology was a combination of both theories<sup>4</sup>.

The vascular theory proposes direct pressure leading to ischemic necrosis as the cause for rupture. Microangiopathic studies have shown the area of tendon in the region of Lister's tubercle proximal to the extensor retinaculum to have a poor blood supply<sup>7,8</sup>. The resulting haematoma and the oedema resulting from the fracture around the wrist<sup>8</sup> further compromises the blood flow to the EPL tendon leading to its degeneration. This would result in rupture of the tendon over time.

On reviewing the x-rays in our case we found that the left radius fracture was more displaced compared with the right. Though satisfactory reduction was achieved post-manipulation we believe the initial insult was from the callus and fractured ends.

At present the patient has been offered an extensor indicis transfer which is a well-accepted way of management<sup>9</sup>.

**References**

1. Bonatz E, Kramer TD, Masear VR. Rupture of the extensor pollicis longus tendon. *American Journal of Orthopaedics*. 2004.
2. Duplay M. Presentation de malades. In: Massen G, ed. *Bulletins et memoires de la societe de chirurgie*. Tome 2. Paris: Libraire de l'academie de medicine, 1876.
3. Jozsa EG, Kannus P. Human tendons: Anatomy, Physiology, and Pathology. Champaign: Human Kinetics. 1997.
4. Helal B, Chen SC, Iwegbu G. Rupture of the extensor pollicis longus tendon in undisplaced Colles' type of fracture. *Hand* 1982.

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5. **Chmell S**, Eight TR, Blair SJ. Rupture of the extensor pollicis longus tendon. *Orthopaedics*. 1983.
  6. **Keiji Kutsumi**, Peter C Amadio, Chunfeng Zhao, Mark E Zobitz, Kai-Nan An. Measurement of gliding resistance of the extensor pollicis longus and extensor digitorum communis tendons within the extensor retinaculum. *The Journal of Hand Surgery*. New York. March 2004.
  7. **Hirasawa Y**, Katsumi Y, Akiyoshi T, Tamai K, Tokioka T. Clinical and microangiographic studies on rupture of the E.P.L. tendon after distal radial fractures. *The Journal of Hand Surgery*. 1990
  8. **Engkvist O**, Lundborg G: Rupture of the extensor pollicis longus tendon after fracture of the lower end of the radius: A clinical and microangiographic study. *Hand* 11:76-86, 1979
  9. **Gelb RI**. Tendon transfer for rupture of the extensor pollicis longus. *Hand Clin*. 1995.