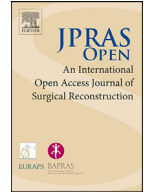


Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

JPRAS Open

journal homepage: [www.elsevier.com/locate/jpra](http://www.elsevier.com/locate/jpra)



## Case Report

# Flexor tendon dysfunction due to a rare fracture of the proximal phalanx: A case report

Raghda Majeed\*, Waseemullah Khan, Adam Sierakowski

St. Andrew's Centre for Plastic Surgery and Burns, Mid Essex Hospitals Trust, Broomfield Hospital, Chelmsford, United Kingdom

### ARTICLE INFO

#### Article history:

Received 6 May 2019

Accepted 10 October 2020

Available online 22 October 2020

#### Keywords:

Flexor tendon

Fracture

Proximal phalanx

Closed injury

### ABSTRACT

Flexor tendon entrapment in fractures of the proximal phalanx is a rare occurrence. This complication has only been reported in association with displaced epiphyseal and diaphyseal fractures. Here we describe a case of an unusual proximal phalangeal fracture pattern with functional hindrance of the flexor mechanism. A 34-year-old man presented with an absent flexor digitorum superficialis (FDS) and flexor digitorum profundus (FDP) function of the ring finger 4 weeks after an injury. X-Ray Examination revealed a bony fragment on the radial volar aspect of the proximal phalanx. USS revealed an intact FDS and FDP tendons. Excision of the bony fragment with tenolysis led to restoration of function.

© 2020 The Authors. Published by Elsevier Ltd on behalf of British Association of Plastic, Reconstructive and Aesthetic Surgeons. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

## Introduction

Flexor tendon dysfunction following fractures of the proximal phalanx is not uncommon. Rarely, such dysfunction can be a manifestation of flexor tendon entrapment in the fracture site.<sup>1</sup> Here, we report a rare fracture configuration of the proximal phalanx; a small osseous fragment directly abutting the flexor tendons preventing their glide. To our knowledge, this fracture pattern and complication has not been reported.

\* Corresponding author.

E-mail address: [r.sarsam@gmail.com](mailto:r.sarsam@gmail.com) (R. Majeed).



**Fig. 1.** Plain oblique radiograph shows a bony fragment on the radial volar aspect of the proximal phalanx of the ring finger.

## Case report

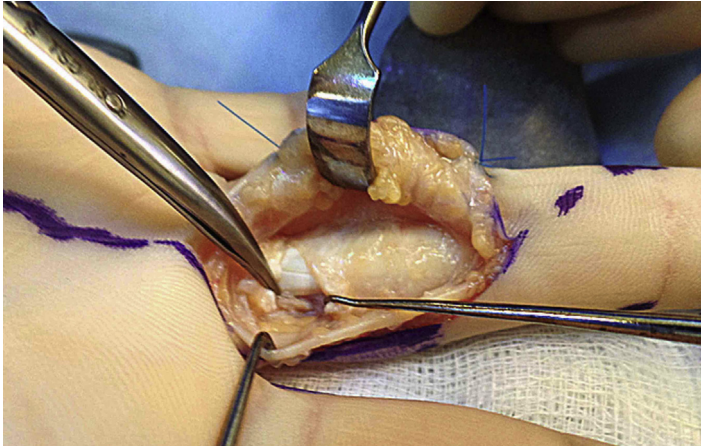
A 34-year old right-handed engineer presented to the emergency department having sustained a right ring finger injury caused by an exercise bench collapsing on him. Initial radiographs taken on the day of injury showed a sliver of bone on the radial volar aspect of the proximal phalanx of the affected finger (Fig. 1). The patient reported inability to flex the finger, however, he was initially managed conservatively.

The patient was referred to our service when his finger movements failed to recover after four weeks. On physical examination, active independent flexion of the proximal and distal interphalangeal joints was absent, whilst passive range of motion in all joints was maintained. Ultrasound examination revealed intact flexor digitorum superficialis (FDS) and flexor digitorum profundus (FDP) tendons, with no evidence of tendon rupture. A fracture fragment was visualised at the midshaft of the proximal phalanx of the ring finger, lying on the radial aspect of FDS.

The patient underwent surgical exploration of the right ring finger. Via a mid-lateral incision, the A2 pulley was partially released and the flexor tendons exposed. A narrow bony fragment was found impinging on the radial side of the flexor sheath with minimal adhesions to FDP and FDS tendons (Fig. 2). The bony fragment was excised and tenolysis was performed achieving good glide of both FDS and FDP. Postoperatively, the patient regained normal active flexion of the ring finger.

## Discussion

While flexion dysfunction after proximal phalangeal fractures is not uncommon, an entrapped tendon as the cause is quite rare. Since its first description by Von Raffler in 1964, only 10 cases of flexor tendon entrapment in a proximal phalangeal fracture have been reported in the English-Language literature.<sup>1-9</sup> Previous reports describe the complication in association with displaced epiphyseal and



**Fig. 2.** Intraoperative photograph demonstrates a bony fragment impinging on the radial side of the flexor tendons of the ring finger.

diaphyseal fractures.<sup>1-9</sup> In this case, however, the inability to actively flex the affected finger was the result of an unusual fracture configuration of the proximal phalanx. A small bony fragment directly impinged the flexor tendons preventing their function.

A literature review reveals that all the reported cases in the adult population were delayed in presentation. Exploration was only warranted when patients failed to regain independent function of the profundus tendon.<sup>1,4,5,8</sup> This case report is no exception. There was a 5-week delay in definitive treatment despite the patient reporting absent finger flexion ever since the injury. Ideally, surgical exploration should have been offered immediately as the chance of this resolving spontaneously with conservative treatment is minimal and delay in treatment leads to more stiffness. A thorough examination and high index of suspicion is required to avoid missing this complication.

High-resolution ultrasonography can differentiate various causes of tendon dysfunction such as adhesions, rupture and tenosynovitis. Pandey et al highlighted its use in accurately diagnosing tendon entrapment in fracture sites and differentiating it from other causes.<sup>8</sup> In our case, ultrasound proved valuable in the evaluating the relationship of the fracture fragment to the flexor tendons and excluding tendon rupture as a cause for loss of active finger flexion.

In conclusion, this report describes a rare fracture configuration of the proximal phalanx, completely impeding flexor tendon function. It emphasizes the importance of careful clinical examination of the hand and suggests ultrasound use as a useful adjunct in the diagnosis and pre-operative planning of such injuries.

### **Declaration of Competing Interest**

None declared.

### **Acknowledgements**

We would like to thank the patient, the library staff and the medical photography department at Broomfield hospital.

### **Funding**

None.

## References

1. Muhammed Sheraz Raza. DmKT. a rare case of flexor tendon entrapment and rupture in proximal phalangeal fracture. Pakistan. *J Plast Surg.* 2015;4:27–31.
2. Al-Qattan MM. Juxta-epiphyseal fractures of the base of the proximal phalanx of the fingers in children and adolescents. *J Hand Surg Br.* 2002;27:24–30.
3. Harryman DT 2nd, Jordan TF 3rd. Physeal phalangeal fracture with flexor tendon entrapment. A case report and review of the literature. *Clin Orthop Relat Res.* 1990:194–196.
4. Hyun Woo S, Sung Kim J, Sik Gong H. A flexor digitorum longus tendon entrapment in a diaphyseal fracture of the proximal phalanx caused by crushing injury. 2005.
5. Jones JM, Schenck RR. Phalangeal entrapment of the flexor tendon—roentgenographic presentation. A case report. *J Bone Joint Surg Am.* 1980;62:136–137.
6. Lee YK, Park S, Lee M. Flexor tendon entrapment at the malunited base fracture of the proximal phalanx of the finger in child: a case report. *Medicine (Baltimore).* 2015;94:e1408.
7. Nogueira A, Alvarez R, Iglesias F. Irreducible phalangeal fracture in a child due to flexor tendon entrapment. *J Hand Surg Am.* 1999;24:924–927.
8. Pandey T, Al Kandari SR, Al Shammari SA. Sonographic diagnosis of the entrapment of the flexor digitorum profundus tendon complicating a fracture of the index finger. *J Clin Ultrasound.* 2008;36:371–373.
9. Rodriguez-Vega V, Pretell-Mazzini J, Marti-Ciruelos R, Jorge-Mora A, de la Mano AC. Simultaneous juxta-epiphyseal proximal phalanx fracture with flexor tendon entrapment in a child: a case report and review of literature. *J Pediatr Orthop B.* 2013;22:148–152.