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**Multiple flexor tendon ruptures due to osteochondroma of the hamate: A case report**

Flexor tendon ruptures hamate osteochondroma

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## **Abstract**

### **BACKGROUND**

Closed rupture of the little and ring finger flexor tendons caused by the hamate is mostly associated with a fracture or nonunion of the hamate hook. Only one case of a closed rupture of the finger flexor tendon caused by osteochondroma in the hamate has been reported. Here, we present a case study to highlight the possibility of hamate osteochondroma as a rare cause of finger closed flexor tendon rupture based on our clinical experience and literature review.

### **CASE SUMMARY**

A 48-year-old man who had been a rice-field farmer for 7–8 h a day for the past 30 years visited our clinic due to the loss of right little finger and ring finger flexion involving both the proximal and distal interphalangeal joints. The patient was diagnosed with a complete rupture of the ring and little finger flexors because of the hamate and was pathologically diagnosed with an osteochondroma. Exploratory surgery was performed, and a complete rupture of the ring and little finger flexors due to an osteophyte-like lesion of the hamate was observed, which was pathologically diagnosed as an osteochondroma.

### **CONCLUSION**

One should consider that osteochondroma in the hamate may be the cause of closed tendon ruptures.

**Key Words:** Flexor tendon; Finger; Closed tendon rupture; Hamate; Osteochondroma; Case report

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**Core Tip:** It is not easy to diagnose osteochondroma in the hamate. Therefore, osteochondroma in the hamate should be considered as a cause when dealing with patients with closed ruptures of the finger flexor tendon. Based on our experience, we also suggest that the surgical treatment of these patients requires careful pre-operative planning and preparation.

## **INTRODUCTION**

Closed ruptures of the flexor tendons other than in nonrheumatic patients are uncommon. These ruptures are frequently caused by intrinsic tendon pathology or structural deformities<sup>[1]</sup>. Closed rupture of the finger flexor tendons caused by the hamate is mostly associated with a fracture or nonunion of the hamate hook<sup>[2,3]</sup>. Only one case of a closed rupture of the finger flexor tendon caused by osteochondroma in the hamate has been reported<sup>[4]</sup>. An osteochondroma is a tumor that arises mainly from the metaphyses of long bones and is the most common form of primary benign bone tumor. However, it is rarely found in carpal bones<sup>[5-8]</sup>. In this report, we present a case study to highlight the possibility of hamate osteochondroma as a rare cause of finger closed flexor tendon rupture based on our clinical experience and literature review.

## **CASE PRESENTATION**

### ***Chief complaints***

A 48-year-old man complained of the inability to flex his right ring finger (RRF) and right small finger (RSF).

### ***History of present illness***

The patient was unable to perform active flexion of the RSF for about 2 wk and active flexion of the RRF for about one week. The condition occurred without pain or a definite episode of trauma.

### ***History of past illness***

He had been a rice-field farmer for 7–8 h a day for the past 30 years.

#### *Personal and family history*

There was no history or evidence of rheumatoid or other inflammatory arthritis conditions.

#### *Physical examination*

Physical examination revealed no swelling or tenderness of the palm. However, he could not actively flex either the proximal or distal interphalangeal joint of the RRF and RSF (Figure 1A-B).

#### *Laboratory examinations*

The patient's rheumatoid serology results were normal.

#### *Imaging examinations*

The radiologist reported no specific findings on preoperative magnetic resonance imaging (MRI) other than ring finger and small finger flexor tendon ruptures (Figure 2).

### **FINAL DIAGNOSIS**

The final diagnosis was multiple flexor tendon ruptures due to osteochondroma of the hamate

### **TREATMENT**

Postoperatively, the wrist was immobilized with dorsal block short arm splint for 2 wk.

### **OUTCOME AND FOLLOW-UP**

The histopathological examination revealed osteochondroma of the hamate with no malignant changes (Figure 4). However, tendon reconstruction could not be performed because the patient did not return to the hospital as he was busy with work.

## DISCUSSION

An osteochondroma is a common tumor that accounts for <sup>6</sup>30% of benign bone tumors and 10–15% of all bone tumors<sup>[9]</sup>. Since most cases are asymptomatic, they are often detected incidentally on radiographs and are commonly found around the knee area. Carpal osteochondroma is very rare and only three cases involving the hamate have been reported<sup>[4,6,8]</sup>. Only one case of carpal osteochondroma associated with a partial rupture of the finger flexor tendon has been reported<sup>[4]</sup>. <sup>3</sup>The low incidence of osteochondromas in carpal bones might be related to the total area of the periosteal surface, which is small in carpal bones compared to long bones or larger tarsal bones<sup>[5]</sup>. In most cases of isolated osteochondromas, conservative treatment with regular follow-up monitoring is conducted<sup>[9]</sup>. However, surgical excision is performed if the tumor size presents an aesthetic problem, pathological fractures or symptoms of nerve or vascular compression appear, limitations in joint movement occur, or tumor exacerbation is suspected<sup>[10]</sup>. Our case involved closed tendon rupture due to a hamate osteochondroma. However, the occurrence of osteochondroma in carpal bones is very rare, and the diagnosis can be very difficult because of its usual occurrence in a long bone and other atypical radiological findings. Similarly, in our case, the size was too small to be detected even on MRI before surgery, but it was found during surgery.

<sup>5</sup>Closed injuries to the flexor tendon are rare and, therefore, can be easily missed initially. The causes of closed rupture of the flexor tendons reported in previous papers were distal radius fractures, nonunions of the scaphoid, tendolipomatosis, dislocations of the lunate, Kienböck's disease, osteoarthritis of the pisotriquetral joint, and fractures or nonunions of the hamate hook<sup>[2,3,11-15]</sup>. Sometimes, closed ruptures of the flexor tendon occur without any underlying pathological conditions. <sup>2</sup>Although the etiology of closed ruptures is unclear, these injuries likely depend on the interplay of several factors, including vascular alterations, repetitive microtrauma, local anatomic features, tendon anomalies, and genetic or other endogenous influences<sup>[16]</sup>.

Closed ruptures of the flexor tendons are usually treated with primary reconstruction through tendon graft interposition or tendon transfer<sup>[17]</sup>. In addition, since

osteochondroma is a benign and slow-growing tumor, it has been reported that there is no problem with primary treatment has been reported, even if accompanied by tendon rupture<sup>[7]</sup>. However, we have limited hand surgery experience at the time of this case. Initially, we planned primary tendon reconstruction via tendon transfer from the third FDS. However, since the third FDS tendon was also frayed and attenuated, tendon transfer could not be performed. As an alternative treatment method, we considered reconstruction using free tendon graft interposition. Two palmaris longus tendons should be harvested to ensure the success of this treatment, but we found this option unsuitable since surgery on this patient was not performed under general anesthesia. Moreover, if the grafted tendon passes through the osteochondroma removal site, there is a possibility of re-rupture due to wear of the tendon. Thus, we performed a Hunter rod insertion instead. However, this was done because of our lack of both experience and thorough preoperative preparation, which would have discovered the osteochondroma before surgery. In this regard, we suggest that careful planning and preparation are needed before surgery for patients with closed ruptures of the flexor tendon.

Rice-field farmers frequently work in small-scale agricultural settings using hand hoes and small sickles. Repetitive movements of the wrist are required to use these tools, and there is <sup>1</sup> full wrist flexion with ulnar deviation. Thus, the FDP tendons of the ulnar digits deviate to an acute angle at the hamate in the carpal tunnel. Moreover, repetition of these movements can produce friction between the flexor tendon and the surface of the hamate, leading to attrition of both the tendon and the surface of the hamate<sup>[18]</sup>. Our patient had been a rice-field farmer for the past 30 years. Long-term repeated movements led to the attrition of both the tendon and the surface of the hamate. Moreover, microtrauma of the hamate because of its irregularity due to an osteochondroma was the main cause of flexor tendon rupture.

One limitation of this case report is that secondary tendon reconstruction could not be performed because the patient did not return to the hospital as he was busy with work.

Therefore, we could not show the final result of his reconstructed fingers, and there was no final follow-up to determine whether the hamate osteochondroma recurred.

### **CONCLUSION**

In the present case, repetitive friction between the flexor tendons and osteochondroma of the hamate may have caused tendon rupture. However, given that it is not easy to diagnose osteochondroma in the hamate, osteochondroma in the hamate should be considered as the cause when dealing with patients with closed ruptures of the finger flexor tendon. Based on our experience, we also suggest that surgical treatment requires careful pre-operative planning and preparation.



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SIMILARITY INDEX

### PRIMARY SOURCES

- 1

G. J. Lee, S. Kwak, H. K. Kim, S. H. Ha, H. J. Lee, G. H. Baek. "Spontaneous Zone III rupture of the flexor tendons of the ulnar three digits in elderly Korean farmers", *Journal of Hand Surgery (European Volume)*, 2014

54 words — 3%

Crossref
- 2

Aaron J. Bois, Geoffrey Johnston, Dale Classen. "Spontaneous Flexor Tendon Ruptures of the Hand: Case Series and Review of the Literature", *The Journal of Hand Surgery*, 2007

33 words — 2%

Crossref
- 3

Manjunath Koti, Savita P. Honakeri, Alexander Thomas. "A Multilobed Osteochondroma of the Hamate: Case Report", *The Journal of Hand Surgery*, 2009

33 words — 2%

Crossref
- 4

f6publishing.blob.core.windows.net

14 words — 1%

Internet
- 5

Martin W. Stenekes, Mike Rüttermann, Paul M.N. Werker. "Rare causes of closed rupture of the flexor tendon", *Journal of Plastic Surgery and Hand Surgery*, 2013

13 words — 1%

Crossref
- 6

Ryutaro Kikuchi, Nobuya Mino, Tadashi Matsukura, Takashi Hirai. "Resected osteochondroma of the rib

13 words — 1%

in an elderly patient", General Thoracic and Cardiovascular  
Surgery, 2010

Crossref

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