International Journal of Research in Medical Sciences
Jiménez-Yarza M et al. Int J Res Med Sci. 2024 Jun;12(6):2113-2116
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20241570

Case Report

Spontaneous rupture of extensor pollicis longus after distal radius fracture: a case report

Miguel Jiménez-Yarza[1]*, Fernando Téllez-Pallares[2], Francisco Alberto Olvera-Yarza[2], José Gerardo Solano-Vázquez[3]

[1]Department of General Surgery, Hospital Regional Monterrey-Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado, Monterrey, Mexico
[2]Department of Plastic Surgery, Centro Médico Nacional Siglo XXI-Instituto Mexicano del Seguro Social, Mexico City, Mexico
[3]Department of Plastic Surgery, UMAE Hospital de Traumatología, Ortopedia y Rehabilitación "Dr Victorio de la Fuente Narváez"-Instituto Mexicano del Seguro Social, Mexico City, Mexico

Received: 19 April 2024
Revised: 15 May 2024
Accepted: 16 May 2024

***Correspondence:**
Dr. Miguel Jiménez-Yarza,
E-mail: migueljy17@gmail.com

ABSTRACT

Extensor pollicis longus tendon rupture, rare and linked to trauma or arthritis, is prevalent post-distal radius fractures. Mechanisms include friction and vascular issues. Manifestations occur 4-8 weeks' post-trauma. We present the case of A 31-year-old male, post-motorcycle accident surgery for distal radius fracture, faced extensor pollicis longus tendon rupture. A surgical intervention transposed the extensor indicis proprius tendon, restoring thumb function. Successful closure and splinting showed no movement limitations at the 12-week follow-up, prompting a rehabilitation referral. Distal radius fracture treatments, whether operative or non-operative, entail risks of extensor tendon complications, notably extensor pollicis longus. While direct suture repair is optimal, studies endorse effective restoration of thumb function through tendon grafts, particularly utilizing the extensor indicis proprius. Rupture of the extensor pollicis longus, while uncommon, often occurs with distal radius fractures. Extensor indicis proprius grafting is recommended for superior efficacy over alternatives, emphasizing the need for accurate and timely diagnosis.

Keywords: Fracture, Tendon, Transfer

INTRODUCTION

First described by Duplay in 1876, the rupture of the extensor pollicis longus tendon is a rare occurrence typically associated with traumatic injuries or rheumatoid arthritis.[1,2] Its prevalence ranges from 0.07% to 0.88%, particularly following distal radius fractures[3] According to Helal et al, the incidence of spontaneous rupture following a Colles fracture is less than 0.2%, with 93% of these cases being undisplaced. Numerous mechanisms have been postulated, including factors such as mechanical friction, vascular impairment, and damage incurred during the reduction process.[4] Nevertheless, debates persist regarding the definitive mechanism.[5] Most cases manifest 4 to 8 weeks after the traumatic event.[3] Patients commonly report pain and tenderness at the wrist, with some describing a distinct "ping" sensation at the time of rupture. This condition leads to impaired thumb extension and a compromised pincer grasp.

CASE REPORT

We present the case of a 31-year-old male with no significant medical history, referred to the plastic surgery department due to a sensation of "rupture" and limited movement during extension of the left-hand first finger

(Figure 1). The diagnosis reveals a complete section of the extensor pollicis longus tendon at zone T1, according to the International Federation of Societies for Surgery of the Hand Verdan classification) (Figure 2).[6] 8 weeks' prior, the patient underwent surgery for an open reduction and internal fixation of a displaced distal radius fracture (type III Fernandez) (Figure 3 and 4) resulting from a motorcycle accident.[7]

Figure 1: Preoperative image showing impaired extension function on the first finger of the hand.

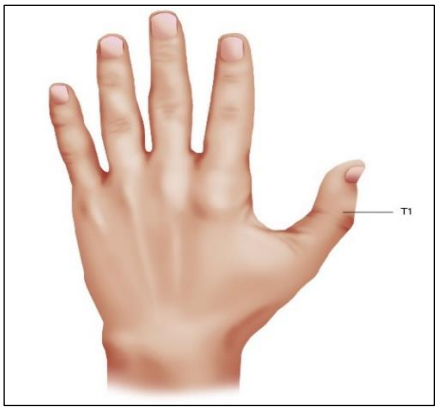

Figure 2: Zone T1, according to the International Federation of Societies for Surgery of the hand (Verdan classification).[6]

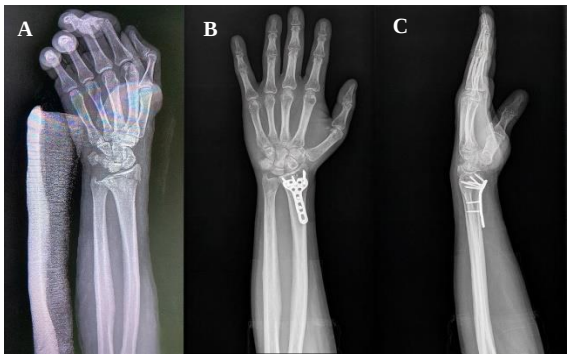

Figure 3 (A-C): Preoperative image showing distal radius fracture, secondly and thirdly; images showing post-surgical radius repair.

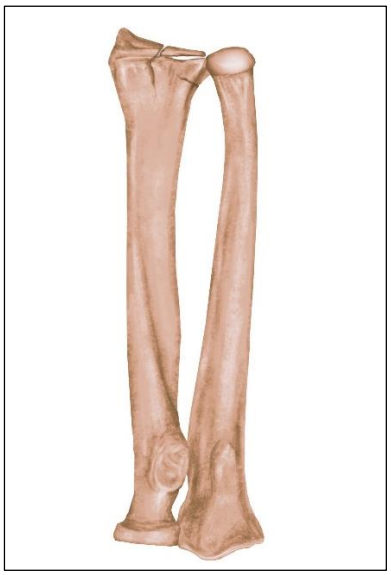

Figure 4: Type III fracture by Fernandez.[7]

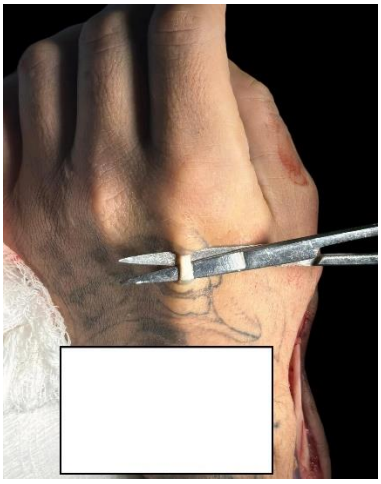

Figure 5: Identification and release of the extensor indicis proprius tendon.

The surgical procedure involved exploring extensor zone T1. Local anesthesia (2% lidocaine), aseptic measures, and antisepsis were applied. A smarch-type ischemia was placed, followed by a 10 cm dorsal incision over the first extensor compartment, extending both distally and proximally. Identification of the entire abductor pollicis longus tendon and extensor pollicis brevis tendon was achieved. The dissection proceeded, revealing the complete extensor pollicis longus tendon with identification of the distal end exhibiting fibrotic tissue and multiple adhesions. However, the proximal end remained unidentified, leading to the decision to perform tendon transposition (extensor indicis proprius to extensor pollicis longus). Incisions were made on the second finger on its dorsal aspect, 1 cm from the metacarpophalangeal joint, to identify and release the extensor indicis proprius tendon (Figure 5). Another incision was made on the extensor retinaculum. Subsequently, the extensor indicis proprius tendon was passed subcutaneously towards the distal end of the extensor pollicis longus (Figure 6). Tenodesis was

executed using a Pulvertaft technique with 3-0 nylon, ensuring the thumb's proper position and verifying extension function (Figure 7). The closure of the skin involved continuous stitches with 4-0 nylon and adequate thumb extension was observed (Figure 8). The ischemia was removed, and a first finger tie splint was applied, followed by bandaging. The procedure concluded successfully. During the follow-up 12 weeks after the procedure, he did not present limitation on movement or finger extension and was referred to the Rehabilitation Department.

Figure 6: Transposition of the extensor indicis roprius tendon towards the distal end of the extensor pollicis longus tendon.

Figure 7: Tenodesis with adequate thumb extension.

Figure 8: Finalized procedure demonstrating adequate thumb extension.

DISCUSSION

Tendon irritation and rupture are recognized complications in both operative and non-operative treatments of distal radius fractures. Notably, the extensor tendons, especially the extensor pollicis longus, are susceptible to rupture due to their close proximity to the radial bony architecture. This injury is attributed to the direct apposition of the tendon over the distal radius, passing through the third dorsal wrist compartment.[8] While direct suture repair is considered the optimal choice, it may not always be feasible. In such cases, tendon grafts and transfers emerge as viable alternatives, with the extensor indicis proprius being the most commonly employed. De Francesco et al reported that, following this procedure, all patients exhibited restored thumb function, showcasing adequate extension, pinch grip, and recovery of thumb abduction to the index finger. The extensor indicis proprius is favored for its 5 cm excursion, fiber length, cross-sectional area, and relative muscle power, closely resembling the extensor pollicis longus and positioning it as an ideal therapeutic approach.[9]

These findings align with the results of Al-Omari et al, who identified surgical tendon transfer of the extensor indicis proprius to the extensor pollicis longus as the most effective management, yielding favorable outcomes.[1]

CONCLUSION

While the rupture of the extensor pollicis longus is an infrequent event, it tends to be a common consequence of distal radius fractures, particularly in undisplaced or minimally displaced cases. Although primary repair is a valid option, some authors advocate for the superior efficacy of extensor indicis proprius grafting in mending the extensor pollicis longus. This approach surpasses alternatives like the extensor carpi radialis longus or the abductor pollicis longus. Managing this condition poses a persistent challenge, necessitating timely and accurate diagnosis to avert enduring complications. Thorough assessment is imperative for selecting the optimal repair strategy tailored to each patient's needs.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Al-Omari AA, AR Altamimi A, ALQuran EA, Ahmad Saleh AA, Alyafawee QM, Audat MZ, et al. Spontaneous Rupture of Extensor Pollicis Longus Tendon: Clinical and Occupational Implications, Treatment Approaches and Prognostic Outcome in Non-Rheumatoid Arthritis Patients: A Retrospective Study. Open Access Rheumatol. 2020;12:47-54.
2. Kim CH. Spontaneous Rupture of the Extensor Pollicis Longus Tendon. Arch Plast Surg. 2012;39(6):680.
3. Song D, Evans R, Arneja JS. Delayed Extensor Pollicis Longus Tendon Rupture following Nondisplaced Distal Radius Fracture in a Child. HAND. 2013;8(2):242-4.
4. Helal B, Chen SC, Iwegbu G. Rupture of the Extensor Pollicis Longus Tendon in Undisplaced Colles' Type of Fracture. Hand. 1982;14(1):41-7.

5. Lee JK, Bang JY, Choi YS, Kim TH, Yu WJ, Han SH. Extensor pollicis longus tendon rupture caused by a displaced dorsal "beak" fragment of Lister's tubercle in distal radius fractures. Handchir Mikrochir Plast Chir. 2019;51(03):199-204.
6. Ishak A, Rajangam A, Khajuria A. The evidence-base for the management of flexor tendon injuries of the hand: Review. Ann Med Surg. 2019;48:1-6.
7. García-Galicia A, Rueda-Mojica JS, Sánchez-Durán MA, Barragán-Hervella RG, Montiel-Jarquín ÁJ, Gaytán-Fernández S. Evolución clínica de trabajadores con fractura de radio distal Fernández III. Tratamiento no complicado quirúrgico y no quirúrgico. Cirugia Cir. 2021;89(3):377-83.
8. Seigerman D, Lutsky K, Fletcher D, Katt B, Kwok M, Mazur D, et al. Complications in the Management of Distal Radius Fractures: How Do We Avoid them? Curr Rev Musculoskelet Med. 2019;12(2):204-12.
9. De Francesco F, Pugliese P, De Francesco M, Pangrazi PP, Riccio M. Brachioradialis Muscle Tendon Transposition in Extensor Pollicis Longus Reconstruction: Anatomical Study and a New Surgical Approach. Hand (N Y). 2022;17(4):780-8.

Cite this article as: Jiménez-Yarza M*, Téllez-Pallares F, Olvera-Yarza FA, Solano-Vázquez JG. Spontaneous rupture of extensor pollicis longus after distal radius fracture: a case report. Int J Res Med Sci 2024;12:2113-6.