

# Simultaneous Dislocation of Both Interphalangeal Joints in the Same Digit of a 56-Year-Old Woman with Workers' Compensation: A Case Report

Danika Z. Bodmer, BS\*; Kristin M. Loker, MSN†; Deana M. Mercer, MD†

\*School of Medicine, The University of New Mexico Health Sciences Center

†Department of Orthopaedics & Rehabilitation, University of New Mexico Health Sciences Center

## Abstract

Dislocation of the interphalangeal (IP) joints of the fingers, particularly on the ulnar side of the hand, is common; however, simultaneous dislocation of both IP joints of the same finger is uncommon, and no studies have reported this injury in patients with workers' compensation claims. We describe a 56-year-old woman with simultaneous dislocation of distal and proximal IP joints, who was successfully treated using a dorsal blocking splint followed by several months of undergoing occupational therapy. She had sustained the injury from a fall on the ground at work and was promptly treated with open reduction at an outside facility. A nearly full return to previous range of motion and strength was noted by 6 months after the initial injury. Although patients with workers' compensation have been described with worsened clinical outcomes, the combination of immediate treatment and multidisciplinary care may help successfully treat this unusual injury.

## Introduction

Although dislocations of the interphalangeal (IP) joints are common, simultaneously dislocating two joints in the same finger has been rare.<sup>1-4</sup> The first case<sup>5</sup> of distal and proximal IP joint dislocations was described in 1874, and the injury has often been associated with high-impact sports activities and falling. Successful treatment has typically involved an immediate reduction, which can help minimize the risk of unstable reduction and thereby avoid excessive operative treatment using K-wires that can result in further damage to the joints. Treatment with closed reduction has been preferred, with early active range of movement to prevent joint contracture.<sup>6</sup>

However, no study has reported on treatment of this injury in patients with workers' compensation, who have been described with worse clinical outcomes than patients

without work-related claims.<sup>7-10</sup> We present an older woman with workers' compensation who had tenderness in the left ring finger after undergoing operative treatment of simultaneous dislocation of the proximal and distal IP joints at an outside facility. After use of a dorsal blocking splint followed by several months of physical therapy, the patient returned to work-related activity without restrictions.

## Case Report

A 56-year-old female engineer fell on the ground in a parking lot at work, which resulted in simultaneous dislocation of both the proximal and distal IP joints of the ring finger of her left hand (Figures 1A and 1B). Initially, the patient was seen at an outside emergency department where the finger was successfully reduced after two attempts and splinted.

On day 4 after her injury, the patient presented for initial evaluation at our facility, at which time reduction had been maintained. The injured hand was neurovascularly intact without evidence of open wounds at the site of injury. On physical examination, the patient was able to flex and extend at the proximal and distal IP joints; however, she was unable to make a full fist and pass the ring finger into full flexion. Additionally, tenderness and edema were noted over the proximal IP joint. Radiographs showed concentric reduction of the distal and proximal IP joints, with volar avulsion fractures of the distal and proximal IP joints. The patient was treated using a dorsal blocking splint, with the proximal IP joint placed at 30° of flexion for 4 weeks. Occupational therapy was also initiated to minimize edema and provide instruction on flexion exercises. Extension of the proximal IP joint was restricted.

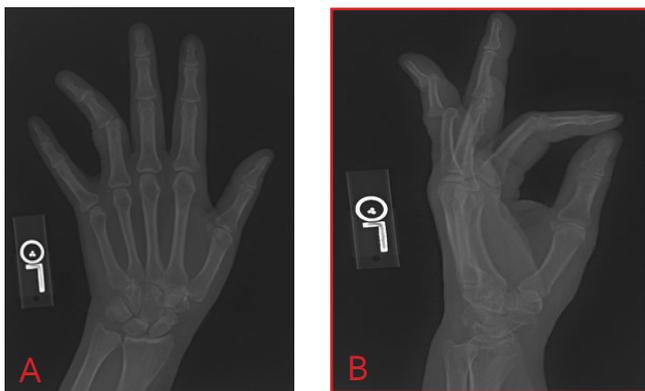
At 4-week follow-up, the patient had continued weekly treatment with occupational therapy with a certified hand therapist. She had moderate, persistent swelling in the left ring finger. Results of a neurovascular examination were normal. Her range of motion in passive and active

flexions had begun improving. The patient was advised to continue therapy on a weekly basis to advance the possible range of motion to include extension. Use of the splint was discontinued at this time.

At 9-week follow-up, persisted swelling with mild discomfort was noted. A full passive extension of the left ring finger was observed, with maximum extension of 5° to 10° at the proximal IP joint. At the proximal and distal IP joints, about 90° and 30° of active flexion were found, respectively. Further treatment to enhance maximum extension of the finger included nightly use of a therapy-manufactured dynamic extension splint. Treatment with occupational therapy was continued on a weekly basis, and work-related activities such as lifting, pushing, pulling, and carrying baggage when traveling were restricted to 4.5 N (10 lb) of maximum force.

At 15-week follow-up, the patient continued to have mild symptoms of pain and swelling over the proximal and distal IP joints. However, attendance of occupational therapy classes and restriction in weight bearing at work had been maintained, with noted improvements in strength and range of motion of the left hand (Figures 2A and 2B). On clinical examination, she could form a full fist and the signs of swelling and range of motion had improved, although a continued limit to maximum extension of her proximal IP joint was observed. Maximum strength was nearly comparable to the uninjured hand in lateral pinch, three-jaw chuck pinch, tip pinch, and grip strength. Limitation of work-related activity and occupational therapy were continued.

At 6 months after initial injury, a maximum extension of 15° at the proximal IP joint was noted (Figures 3A and 3B). The clinical improvement was believed to have plateaued, and the patient returned to unrestricted work-related duties.



**Figure 1.** Preoperative radiographs of the left hand, showing simultaneous dislocation of proximal and distal interphalangeal (IP) joints of the left ring finger. (A) Posterior view. (B) Lateral view, with flexion of thumb IP and index distal IP joints.



**Figure 2.** Radiographs of the left hand at 15-week follow-up, showing swelling over the proximal and distal interphalangeal (IP) joints. (A) Posterior view. (B) Lateral view, with flexion of thumb IP and index distal IP joints.



**Figure 3.** Photograph at 6 months after initial injury, showing nearly full return of range of motion and strength of the left hand. (A) Anterior view, with maximum extension of proximal and distal interphalangeal joints at 15°. (B) Hand successfully positioned into a clenched fist.

## Discussion

To our knowledge, no other studies have reported on patients with simultaneous dislocation of proximal and distal IP joints of the same digit, an uncommon injury, and workers' compensation. Worse clinical outcomes have been described in patients with workers' compensation compared with those without the claim, especially in reported levels of pain.<sup>7-10</sup> However, clinical improvement was noted with our patient after treatment, with a nearly full return to previous levels of range of motion and strength at 4 months after injury.

In the current case, closed reduction was successfully achieved immediately after the injury. Additionally, the patient received immediate care from an orthopaedic hand specialist, in which proper immobilization, restrictions, and occupational therapy were initiated. The recovery of

the patient was noted with mild pain and swelling of the left hand, although a minimal limit persisted in maximum extension of the proximal IP joint. Immediate operative treatment followed by nonoperative techniques may help in successfully treating simultaneous dislocations of proximal and distal IP joints in patients with workers' compensation.

## Funding

The authors received no financial support for the research, authorship, and publication of this article.

## Conflict of Interest

The authors report no conflicts of interest.

## Informed Consent

The patient was informed that the data concerning the case would be submitted for publication, and she provided verbal consent.

## References

1. Jahangiri SA, Mestha P, McNally S. Double dislocation of finger interphalangeal joints. *BMJ Case Rep* 2012;2012.
2. Hara K, Uchiyama S, Kato H. Irreducible simultaneous dislocation of both interphalangeal joints in the little finger: a case report. *Hand Surg* 2009;14(1):39-42.
3. Nakago K, Hashizume H, Senda M, Nishida K, Masaoka S, Inoue H. Simultaneous fracture-dislocations of the distal and proximal interphalangeal joints. *J Hand Surg Br* 1999;24(6):699-702.
4. Hester T, Mahmood S, Morar Y, Singh R. Simultaneous dislocation of both interphalangeal joints in the middle finger. *BMJ Case Rep* 2015;2015.
5. Fu LJ, Dai KR. Simultaneous double dislocation of the interphalangeal joint in one finger [in Chinese]. *Chin Med J* 2013;126(5):974-5.
6. Seki Y. Simultaneous double dislocation of the interphalangeal joint of the same finger: a report of two cases. *Pan Afr Med J* 2014;19:400.
7. Harris I, Mulford J, Solomon M, van Gelder JM, Young J. Association between compensation status and outcome after surgery: a meta-analysis. *JAMA* 2005;293(13):1644-52.
8. Koljonen P, Chong C, Yip D. Difference in outcome of shoulder surgery between workers' compensation and nonworkers' compensation populations [published erratum in: *Int Orthop* 2009;33(2):321]. *Int Orthop* 2009;33(2):315-20.

9. Atroschi I, Johnsson R, Nouhan R, Crain G, McCabe SJ. Use of outcome instruments to compare workers' compensation and non-workers' compensation carpal tunnel syndrome. *J Hand Surg Am* 1997;22(5):882-8.

10. Higgs PE, Edwards D, Martin DS, Weeks PM. Carpal tunnel surgery outcomes in workers: effect of workers' compensation status. *J Hand Surg Am* 1995;20(3):354-60.