

Floating phalanx; simultaneous double dislocation of the interphalangeal joint in a finger: A case report and literature review

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ABSTRACT

Isolated proximal and distal interphalangeal joint (DIPJ) dislocations are widely seen as a result of sporting injuries and major trauma. The combination of dorsal dislocation of the DIPJ in the same finger concomitant to traumatic dorsal dislocation of the proximal interphalangeal joint (PIPJ) is a rarely seen injury. The case is, here, presented of a 65-year-old female patient with proximal and DIPJ dislocation of the right-hand ring finger accompanied by volar and dorsal plate injuries in the proximal and distal joints. With this case, it was aimed to introduce a new term of “floating phalanx” into medical literature. The treatment was applied to the patient of closed reduction under peripheral block and the application of an aluminium finger splint in semiflexion. In a 24-month follow-up period, the 4th finger of the patient was observed to be stable and has pain-free range of movement. This case is an uncommon case of volar and dorsal plate avulsion fractures with PIPJ and DIPJ dorsal dislocation treated successfully with closed reduction and conservative treatment with excellent functional results.

Keywords: Interphalangeal joints dislocation; phalanx dislocation; volar plate injury.

INTRODUCTION

Following hyperextension damage caused by volar and dorsal plate avulsion injuries, the double dislocation of the interphalangeal joints in the same finger is rarely seen.^[1] Treatment and rehabilitation are necessary for the patient to regain the pre-trauma level of function. Conservative treatment is considered first for these patients, with reduction followed by immobilization for 2–4 weeks.^[1] In the case presented in this paper, a 65-year-old female patient was treated conservatively for volar and dorsal plate avulsion fractures concomitant to traumatic dorsal dislocation of the proximal and distal interphalangeal joints (DIPJ) in the ring finger. The reduction was achieved by closed manipulation, followed by splinting in the “intrinsic plus” position. The patient was followed up for 4

weeks with an aluminium finger splint and early mobilization was started after removal of the splint. In the 36-month follow-up period of the patient, pain-free joint range of motion was obtained. The aim of this case presentation was to draw attention to the rarely seen pathology of a double interphalangeal joint dislocation concomitant to a volar and dorsal plate avulsion fracture injury which occurred as a result of hyperextension and was successfully treated conservatively.

CASE REPORT

A 65-year-old female presented at the Emergency Orthopedics Polyclinic with complaints of pain, swelling, and deformity in the right-hand ring finger following a fall onto the fingers of the right hand after being struck by a motor vehicle. Informed

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consent was obtained from the patient. In the examination of the patient, there were swelling and deformity in the right-hand ring finger and the neurovascular examination was normal. On full anteroposterior and full lateral radiographs taken of the right-hand ring finger, dorsal dislocation was observed of the middle phalanx, of the proximal phalanx and dorsal dislocation of the distal phalanx on the head of the middle phalanx were also seen (Fig. 1a and b). The mechanism causing these kinds of injuries comes from force onto the fingertips, while the fingers are in hyperextension, first creating injury to the distal joint volar plate with dislocation of the distal joint and with continuation of the force, with the effect of the force loaded on the proximal joint, injury to the volar plate in the proximal, and then dislocation of the proximal joint.^[1]

The patient was admitted for treatment. Under peripheral block, by applying hyperextension and traction first to the distal joint then to the proximal joint, closed reduction was applied, and then, the stress test was made on both joints to check stability. In the physical examination made after reduc-

tion, the neurovascular examination was seen to be normal. An aluminium splint was then applied in the “intrinsic plus” position (Fig. 2a and b). On the radiograph taken of the patient, the reduction in both joints was seen to be complete. After 4 weeks, the aluminium finger splint was removed, radiographs were taken of the patient (Fig. 2c and d), and physical therapy was started. In the last follow-up of the patient at the 72th month, her physical examination was performed and her final radiographies were taken (Fig. 3a, b). Patients’ pain-free range of movement was seen in the proximal and DIPJs with the proximal joint at 0–90° and the distal joint at 0–70° (Fig. 4a-c). No instability was determined in either joint in the coronal plane. In the 72th month, the DASH score of the right hand of the patient was evaluated as 86.

DISCUSSION

The first case of a double dislocation of a digit was reported in 1874 by Bartels.^[2] The PIP and DIP joints are hinge type joints, formed of the joint capsule, collateral ligaments, volar plate,

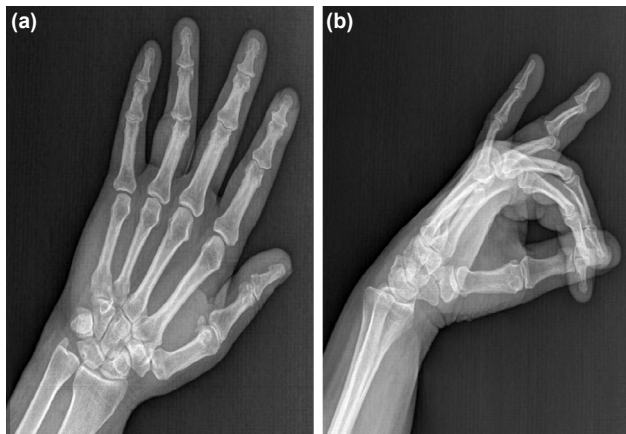


Figure 1. (a) On full anteroposterior radiographs taken of the right-hand ring finger, (b) On full lateral radiographs taken of the right-hand ring finger.



Figure 2. (a) An anteroposterior radiographs after reduction, (b) a lateral radiographs after reduction, (c) an anteroposterior radiographs after the aluminium finger splint was removed, and (d) a lateral radiographs after the aluminium finger splint was removed.

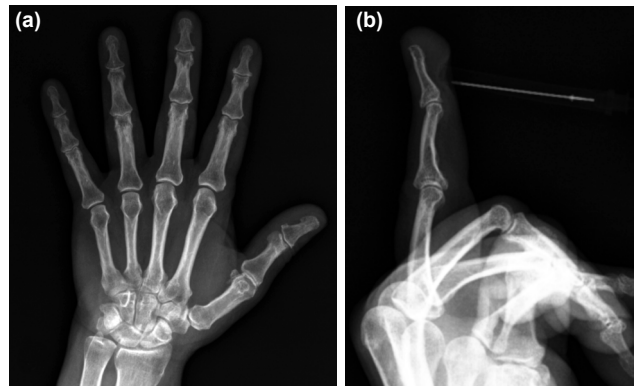


Figure 3. (a, b) Anteroposterior and lateral radiography of the patient at 72th month follow-up.

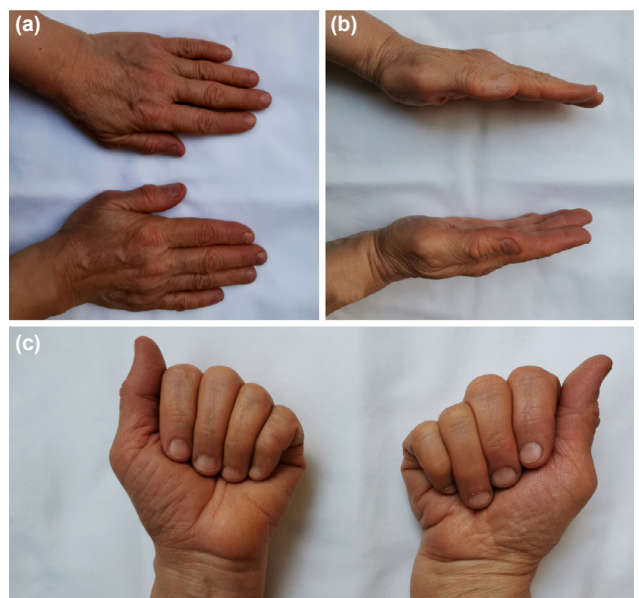


Figure 4. (a-c) Clinical photograph showing the joint motion of the right-hand ring finger at the 42th month of the patient.

and central slip. These structures form a tight-fitting “box” with a very narrow joint space. Proximal and DIPJ injuries occur following high-energy trauma.^[3,4] Dorsal dislocation at the PIP joint and a dorsal dislocation of the DIP joint occurring concurrently with a volar and dorsal plate avulsion fractures has not previously been reported in the orthopedic literature.

In the current case, the patient fell onto the fingers of the right hand after being struck by a vehicle and dorsal and volar plate injury was determined concomitant to PIP and DIP joint dislocations in the ring finger. Soft-tissue injuries in these joints may be partial or total.^[3] In the literature, it can be seen that cases of these types of double dislocations occur more often in male patients and are most often in the right hand in the 5th finger, followed by the 4th, 3rd, and 2nd finger.^[5] This type of injury has only been reported in the thumb in one case by Hutchison et al.^[6] The current case was a 65-year-old female with double dislocations determined in the ring finger of the right hand.

There are conservative and surgical treatment approaches for proximal and DIPJ injuries. The treatment should be applied rapidly to avoid impairment of the circulation in the finger as far as possible. In volar plate injuries, open reduction, and internal fixation, volar plate arthroplasty and superficial tendonesis have been used, but the results of these treatment approaches are controversial.^[7] Open surgery should be considered more if there is soft-tissue interposition, a large bone fragment or a full layer ligament tear.^[1] Dorsal dislocations are the most common, are usually closed, and can therefore be easily reduced closed. Open reduction may be required in cases of volar plate entrapment.^[3,8,9] In the current case, surgery was not considered for the patient as before and after reduction, the bone fragments accompanying the volar and distal plate injury were small and there was no instability in the joint stress test.

In the literature, the term “double dislocation” is used in these types of injuries, where there is complete disruption of the relationship of the mid-phalanx with the proximal and DIPJs, but it could be considered that the term “floating phalanx” would be more appropriate.

Conclusion

Traumatic dorsal dislocation of the proximal interphalangeal joint and volar dislocation of the DIPJ in the fourth finger with volar and dorsal plate avulsion fracture is a rare injury and is usually a consequence of major trauma. Closed reduction under local anesthetic and conservative follow-up is a successful treatment method.

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

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OLGU SUNUMU - ÖZ

Yüzen falanks; interphalangeal eklemin eşzamanlı çift çıkığı: Olgu sunumu ve literatür taraması

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İzole proksimal ve distal interfalangeal eklemler çıkıkları spor yaralanmaları ve majör travmanın bir sonucu olarak yaygın olarak görülür. Proksimal interfalangeal eklemin travmatik dorsal dislokasyonuna eşlik eden aynı parmakta distal interfalangeal eklemin dorsal çıkıklarının birlikteliği çok nadir görülen yaralanmalardır. Bu yazıdaki olguda, sağ el yüzük parmak proksimal ve distal interfalangeal eklemler çıkığına eşlik eden proksimal ve distal eklemlerde volar ve dorsal plate yaralanması olan 65 yaşındaki kadın hastayı sunmayı ve tıp literatürüne yeni bir tanım getirmeyi amaçladık: “Yüzen falanks”. Hastaya periferik blok altında kapalı redüksiyon yapıp semifleksiyonda alüminyum parmak ateli uygulandı. Yirmi dört aylık izlemde, hasta dördüncü parmağında ağrısız bir hareket aralığına ve stabilizeye sahipti. Bu olgu ayrıca, volar ve dorsal plak avulsiyon kırıklarının avulsiyonu ile PIPJ ve DIPJ'nin dorsal çıkığı kapalı redüksiyon ve konservatif tedavi ile mükemmel bir fonksiyonel sonuçla başarıyla tedavi edilen nadir olgulardandır.

Anahtar sözcükler: Falanks çıkığı; interfalangeal eklemler çıkığı; volar plak yaralanması.

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