



## Disjointed Digit

Alex MacLean, BSc; and Ryan J. Henneberry, BSc, MD, CCFP(EM)

### Edgar's presentation

- Edgar, 70, presents to the emergency department complaining of a throbbing finger since falling two days prior.
- His pain has been persistent, localized to his right index finger and he complains that he cannot move it.
- On exam, his finger is grossly deformed, swollen and tender to palpate.
- He has limited active range of motion and finds passive range of motion painful.
- His strength is also decreased.
- He has not experienced any subsequent paresthesias after falling.
- There is no delay in capillary refill time and Edgar is otherwise well.
- An X-ray is taken.



Figure 1. A pre-reduction X-ray showing an ulnar dorsal dislocation of the right second digit proximal interphalangeal. A closer assessment also shows a linear ossific density along the volar aspect of the joint on the middle phalanx that is consistent with a small fracture fragment.

### Questions & Answers

#### 1. What is the diagnosis?

This is a simple ulnar dorsal dislocation of the second proximal phalanx. The usual mechanism of injury is a blow to the extended finger, which creates an axial load that causes hyperextension and subsequent dislocation.<sup>1</sup> The dislocation is a result of a damaged volar plate.

Other proximal interphalangeal (PIP) dislocations to consider are lateral dislocations that result from damaged collateral ligaments as a result of radial or ulnar forces and at least partial avulsion of the volar plate. Volar dislocations result from rotary axial compression forces to a slightly flexed digit.<sup>1</sup> Volar dislocations are not common and involve unilateral collateral ligament and partial avulsion of the volar plate. PIP dislocations are among the most common hand injuries, seen most often in high-velocity blows during sporting activities, although falls are a more common cause in the elderly.<sup>2</sup> An X-ray should be done to confirm the type of dislocation and to rule out a fracture before proceeding with treatment.

#### 2. How is it managed?

The quicker the dislocated finger is reduced, the better the outcome.<sup>1</sup> A digital nerve block may be needed for analgesic reasons before reduction in some patients, although that was not the case with Edgar.

To reduce it (Figure 1), the finger is firmly grasped at the proximal portion of the dislocated phalanx, using gauze for a secure grip and retracted horizontally in a slightly hyperextended position.<sup>3</sup> This action should be done for a minute or two, to relax the patient and the surrounding muscles making reduction easier. The joint can usually be reduced by applying firm dorsal pressure on the middle phalanx.<sup>1-3</sup>

The goal is to reverse the mechanism of the injury, returning to the normal anatomical position. Caution should be taken in the pediatric population in order to avoid additional damage to the volar plate that can occur when reduction is done improperly. If reduction is still difficult after a few tries, it should not be forced—a trapped volar plate may be inhibiting the reduction. In these cases, a surgical consult is recommended and open reduction may be required.

After a successful reduction (Figure 2), the joint should be tested for flexor-extensor tendon function, active range of



Figure 2. A post reduction X-ray showing the PIP reduced to proper anatomical position.


motion, tenderness and collateral joint stability.<sup>3</sup> Edgar felt pain relief with reduction, but this is not always the case. A post reduction X-ray should be compared with the initial X-ray to ensure that reduction was successful and that no additional fractures have occurred.

### 3. What are some complications that can result?

The most common complication of a posterior PIP dislocation is a sustained volar plate injury. This can lead to chronic laxity, a hyperextensible finger that appears swan-shaped on active extension or flexion contracture.<sup>3</sup> Delayed or improper reduction can result in joint instability and recurrent dislocations.

Bone avulsions and/or fracture fragments are other common complications. On closer assessment of Edgar's X-ray, there is a linear ossific density along the volar aspect of the joint on the middle phalanx, which is consistent with a small fracture fragment. This is referred to as a volar-lip fracture dislocation.<sup>2</sup> When more complex dislocations are suspected, a plastic or orthopedic surgery consult is recommended.

### 4. What can Edgar expect after leaving the hospital?

Edgar should be sent home with his finger splinted at 20 to 30 degrees of flexion in a dorsal-block, foam-padded splint that should remain in place for 14 to 21 days. Taping to the middle digit for an additional one to three weeks may be necessary.<sup>1-3</sup> Complete PIP immobilization is not recommended and, to achieve joint mobility, range of motion exercises should be performed several times a day within the splint.<sup>2</sup> Even for simple dislocations, patients can experience pain, swelling and a decreased range of motion for six months to a year. Non-steroidal anti-inflammatory drugs are useful for initial swelling and pain. 

#### References

1. Marx J, Hockberger R, Walls R, et al. (Eds.): *Rosen's Emergency Medicine: Concepts and Clinical Practice*. Fifth Edition. Mosby Inc, St. Louis: 2002. p. 483, 518-9.
2. Chinchalkar SJ, Gan BS: Management of Proximal Interphalangeal Joint Fractures and Dislocations. *J Hand Ther* 2003; 16(2):117-28.
3. Young GM: Dislocations, *Interphalngeal*. 2004; [www.emedicine.com](http://www.emedicine.com).

Mr. MacLean is a second year medical student at Dalhousie University, Halifax, Nova Scotia.

Dr. Henneberry is a Lecturer at Dalhousie University, Department of Medicine and Active Staff at the Department of Emergency Medicine, Queen Elizabeth II Health Science Centre, Halifax, Nova Scotia.

*This department covers selected points to avoid pitfalls and improve patient care by family physicians in the ED. Submissions and feedback can be sent to [diagnosis@sta.ca](mailto:diagnosis@sta.ca).*