Late Diagnosed Dislocation of the Proximal Interphalangeal Joint of the 5th Toe in a 7-Year-Old Boy: A Case Report

Alper Koksal, MD*

Kadir-Abul, MD†

Osman Cimen, MD*

*Department of Orthopedics and Traumatology, Baltalimani Bone Diseases Training and Research Hospital, Baltalimani, Istanbul, Turkey.

†Department of Orthopaedics and Traumatology, Istanbul Basaksehir Pine and Sakura State Hospital, Istanbul, Turkey.

Corresponding author: Alper Koksal, MD, Department of Orthopedics and Traumatology, Baltalimani Bone Diseases Training and Research Hospital, Baltalimani, Hisar Caddesi, Istanbul, Turkey, 34470. (E-mail: dralperkoksal@gmail.com)

Dislocation of the proximal interphalangeal (PIP) joint of the fifth toe is an uncommon injury and when diagnosed in the acute phase closed reduction is commonly an adequate treatment option. We describe a rare case of a 7-year-old patient presented with late diagnosed isolated

How to cite this article: JAPMA 112 (3): e1-e13
dislocation of the PIP joint in the fifth toe. Although there are a few reported cases of late
diagnosis combined fracture-dislocation of the toes in both adult and pediatric age group in the
literature, belatedly diagnosed dislocation of the 5th toe without accompanying fracture in the
pediatric population has not yet been reported as far as we know. This patient achieved good
clinical outcomes following treatment via open reduction and internal fixation

Isolated, traumatic dislocation of the interphalangeal toe joint is an uncommon foot injury
usually associated with other foot injuries.\textsuperscript{1} Although the closed reduction is successful when
diagnosed in the acute phase,\textsuperscript{2} chronic and irreducible dislocations of the toes may need to be
treated with open reduction and internal fixation.\textsuperscript{3} Chronic and recurrent dislocations of the
fifth toe are relatively rare in the adult and pediatric age group.\textsuperscript{4}

A few reported cases of late diagnosis combined fracture-dislocation of the toes in both
adult and pediatric age groups in the literature exist. However, belated diagnosed isolated
dislocation of the 5th toe without accompanying fracture in the pediatric population has not
yet been reported to the authors best knowledge. In the present report, we describe a rare
case of a 7-year-old patient presented with late diagnosed isolated dislocation of the PIP joint in
the fifth toe.

How to cite this article: JAPMA 112 (3): e1-e13
CASE REPORT

A 7-year-old boy was admitted to the trauma center due to deformity in the 5th toe of his right foot. The trauma occurred 2 months prior to admission. Pain, swelling, and deformity occurred in the 5th toe of the foot after striking a football without football shoes. The patient's family was reluctant to immediately take him to the hospital for fear of ongoing COVID-19 pandemic. Instead, he was taken to a local bonesetter. A bonesetter is a practitioner of joint manipulation. Before the advent of chiropractors, osteopaths and physical therapists bonesetters were the main providers of this type of treatment. Traditionally, they practiced without any formal training in accepted medical procedures. Bonesetters would also reduce joint dislocations and "re-set" bone fractures. The practice of joint manipulation and treating fractures dates back to ancient times and has roots in most countries. The bonesetter applied an inconvenient treatment to the patient. After this treatment, the patient's foot remained in a bandage for approximately 1 month. After 1 month, the bandages were removed. The patient's family determined that while the pain and edema in the 5th toe had improved the deformity persisted. The patient, who was then taken to several different hospitals by his family, was referred to our trauma center at the end of the 2nd month after the initial trauma. In our first examination of the patient, there was no observed pain and swelling. The only pathological finding of the patient was a valgus deformity in the 5th toe. The patient's sole complaint was

How to cite this article: JAPMA 112 (3): e1-e13
that he could not wear shoes due to the deformed toe. Weight bearing comparative radiographs of both feet were taken. Complete dislocation of the PIP joint was detected without any signs of fracture (Figure 1). The situation at that time was discussed with the family in detail. The patient’s family was informed that even though reduction might not be achieved due to chronic dislocation, closed reduction under anesthesia would be attempted. If a successful closed reduction could not be achieved, surgical treatment would be performed. The patient was taken to the operating table under general anesthesia and closed reduction was attempted using gentle maneuvers under fluoroscopy. This was not successful.

Surgical Treatment

Surgery was performed under general anesthesia. The patient was operated upon in the supine position, with tourniquet pressure applied to the relevant extremity. A dorsal longitudinal skin incision centered over the fifth toe was made. By preserving the extensor tendon, the PIP joint was reached. It was observed that the joint was occupied by granulation tissue with entrapped joint capsule remnants. These tissues were completely removed without damaging the cartilage. The joint was reduced. One K-wire was placed in a retrograde fashion from the tip of the distal phalanx to maintain the satisfactory reduction and alignment (Figure 2). The wound
This Clinically Speaking is a preprint. It has been reviewed, accepted for publication, and approved by the author but has not been copyedited, proofread, or typeset.

was irrigated, the tourniquet was deflated, bleeding was controlled, and finally, the wound edges were sutured accordingly.

Postoperative Follow-Up

Intravenous Cefazolin Sodium was administered postoperatively on the first day. The patient was immobilized with a non-weight-bearing short leg cast after surgery. The patient had no wound problems, such as drainage from the wound, erythema or swelling around the wound.

On the second postoperative day, he was discharged from the hospital. The first follow-up after surgery was performed on the 10th postoperative day and sutures were removed. Successive follow-ups were scheduled once every 10 days. AP and lateral foot X-Ray images were recorded at each visit (Figure 3). The K-wire and cast were removed 4 weeks after the surgery as follow-up radiographs revealed an acceptable alignment, and the patient started full weight-bearing activity without a cast. There were no complications observed either during the early postoperative period or up to the time of the last follow-up.

The patient had no complaints at the 8 month follow up visit and his 5th toe exhibited good alignment both clinically and radiologically (Figure 4 and Figure 5). There was no limitation of range of motion or restriction of activity.

How to cite this article: JAPMA 112 (3): e1-e13
Discussion

Chronic and recurrent dislocations of the fifth toe are relatively rare in both adult and pediatric age group.\textsuperscript{4} In a case report of chronic irreducible isolated dislocation of the proximal interphalangeal joint of the fifth toe, authors performed an open reduction of the joint and the corrected position of the PIP joint was maintained by inserting a longitudinal Kirschner wire. They reported good clinical and radiographic outcomes.\textsuperscript{1} In this case, the patient was in an adult group different from our case.

Ween et al. reported a case of an irreducible fracture-dislocation of the proximal interphalangeal joint of the fifth toe in a 65-year-old man.\textsuperscript{3} In this report, after a dorsal approach, the interposition of the short flexor tendon and the volar plate was revealed in the interphalangeal joint. The interposition was corrected, and reduction was successfully accomplished. The distal fracture fragment was fixed with a Kirschner wire. They also reported no re-dislocations, and satisfactory function of the toe was maintained. In this report, the patient was both in the adult group and had a combined fractured-dislocation unlike our case.

In the pediatric patient, these conditions are extremely uncommon and only a few case reports can be found in the literature. A fracture-dislocation of the fifth toe in a two-year-old girl was reported by Kushare et al. as they performed open reduction after dissecting the soft tissues and clearing out scar tissue in the PIP joint space.\textsuperscript{4} Because of the chronic nature of the fracture

How to cite this article: JAPMA 112 (3): e1-e13
dislocation, the reduction was unstable, and they used K-wire to maintain the reduction. After 18 months of follow-up, they reported a good clinical alignment of the fifth toe with no residual pain. In this report, the patient was in the pediatric age group, but there was a combined fracture and dislocation.

In another case of a 10-year-old girl with a dislocation of the proximal interphalangeal (PIP) joint of the fourth toe and fracture of the articular base of the middle phalanx authors performed an open reduction revealing incarcerated the volar plate at the fracture site and reported good outcomes in terms of both clinical alignment and pain.\(^5\)

In conclusion, we present, to the best of our knowledge, a so far unpublished clinical scenario of a belatedly diagnosed dislocation of the 5th toe without accompanying fracture in a 7-year old boy patient. It should be kept in mind that such incidents may occur in children and that treatment should be arranged in a timely manner. Irreducible isolated PIP joint dislocation of the 5th toe after appropriately closed reduction attempts can safely be treated with open reduction and K-wire fixation using a dorsal approach in the pediatric age group.

CONSENT

The patient and his family agreed that the doctors could use and publish our study of his illness and treatment with the relevant personal information deleted.

How to cite this article: JAPMA 112 (3): e1-e13
Financial Disclosure: None reported.

Conflict of Interest: None reported.

REFERENCES


5) Neubauer T,Wagner M,Quell M Interphalangeal dislocation of the fourth toe with avulsion-fracture in a child: report of a case. Foot Ankle Int. 1997 Mar;18(3):175-7

How to cite this article: JAPMA 112 (3): e1-e13
This Clinically Speaking is a preprint. It has been reviewed, accepted for publication, and approved by the author but has not been copyedited, proofread, or typeset.

Figure 1: Preoperative radiographs showing the isolated PIP joint dislocation

How to cite this article: JAPMA 112 (3): e1-e13
This Clinically Speaking is a preprint. It has been reviewed, accepted for publication, and approved by the author but has not been copyedited, proofread, or typeset.

Figure 2: Postoperative radiographs showing reduction and fixation by K-wire

How to cite this article: JAPMA 112 (3): e1-e13
Figure 3: The first follow-up AP and Lateral radiographs showing good alignment
This Clinically Speaking is a preprint. It has been reviewed, accepted for publication, and approved by the author but has not been copyedited, proofread, or typeset.

Figure 4: Final follow up Ap and Lateral radiographs showing good alignment
Figure 5: Final follow up images showing good alignment clinically