

Neglected Posterior Dislocation of the Proximal Interphalangeal Joint of the 5th Finger by Incarceration of the Volar Plate: About A Case

M. Abakka^{1*}, H. El Ouagari¹, Y. Baidriss¹, M. J. Mekkaoui¹, M. Bouffetal¹, R. A. Bassir¹, M. Kharmaze¹, M. O. Lamrani¹, M. S. Berrada¹

¹Department of Orthopedic and Traumatological Surgery, Ibn Sina Hospital, Rabat, Morocco

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*Corresponding author: M. Abakka

Department of Orthopedic and Traumatological Surgery, Ibn Sina Hospital, Rabat, Morocco

Abstract

Original Research Article

Volar dislocation of the proximal interphalangeal joint phalanx of the fingers is a very rare entity. Indeed, there is still no consensus that specifies the treatment of this injury. The closed reduction external maneuver should always be tried first intention, but it can lead to failure and will be followed by surgical treatment. We report the case of palmar dislocation of the proximal interphalangeal joint phalangeal pure treated by opened and surgical reduction, followed by an arthrosis by a Kirschner pin size 16.

Keywords: Finger-Plate-Dislocation-Pain-Deformation-Arthrotomy.

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INTRODUCTION

The dislocation of the proximal interphalangeal joint is common. It mainly occurs during sport activities. In 16 to 17% of cases, the trauma causes tearing of the palmar plate.

This wrenching is the result of a lesion mechanism in hyperextension, ranging from a sprain of the volar plate to dorsal IPP dislocation. The treatment of these lesions is frequently neglected, even when it comes to a dislocation, the reduction of which is often carried out easily and immediately by the patient or his entourage.

In the absence of early treatment, the volar plate can retract and be the cause of an irreducible extension deficit of the IPP, giving the appearance of a false buttonhole. The patient, handicapped by the stiffness of his finger, consults in our orthopedic structure.

Anatomy of the IPP

The IPP is a trochlear-type joint with one degree of freedom. It has an axis sagittal around which the movements of flexion and extension take place. However, the configuration of the articular surfaces, the tension of the capsulo-ligamentous structures and the muscular synergies submit the articular centers to a constant migration. So the flexion extension of the

digital rays is not pure, it is combined with phenomena of axial rotation and lateral translation.

Many elements contribute to the stability of the IPP. The IPP has a passive stability of osteo-articular origin. The good congruence of the PPI contributes to its anteroposterior stability [3]. The head of the first phalanx has two condyles separated by a groove to which the median crest of the base of the second phalanx. The condyles have a trapezoidal shape making the joint even more stable in bending. The base of P2 consists of two glenoid cavities separated by the median crest and prolonged by the dorsal tubercle.

Passive stability of capsule-ligament origin is managed by the capsule (envelope of the articulation) reinforced by the following elements:

• The lateral ligaments

The main beam is inserted at the level proximal on the lateral aspect of the condyle (P1) and inserts distally on the lateral face of the base of P2, as well as on the part distal to the volar plate.

Its proximal insertion on the sagittal axis of flexion/extension provides it with tension constant whatever the amplitude of flexion or extension.

The accessory bundle has the same proximal insertion as the main bundle and inserts distally to the

lateral edge of the volar plate and to the sheath of the flexors.

It is tense in extension of the PIP, and relaxed in flexion.

The palmar plate, also called glenoid fibrocartilage, is located on the anterior surface of the IPP. Its proximal insertion is an arciform cutout with at each of its ends on the sides a brake, which attaches to the neck of P1 downstream of the pulley A2.

Its distal insertion on the base of P2 is the strongest, especially on its lateral parts. The volar plate limits the hyperextension of the PIP, and plays a role in its lateral stability.

It promotes the angle of attack of the flexors by increasing their distance from the axis of rotation of the joint. The palmar plate does not limit the amplitude in flexion.

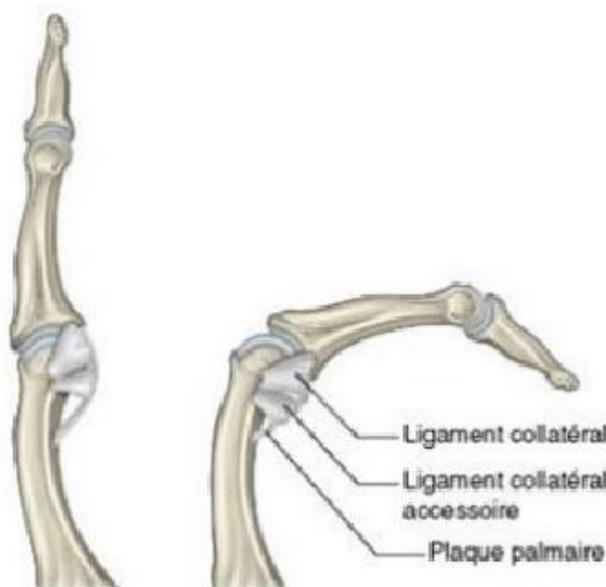


Figure 1: Lateral view of IPP ligaments

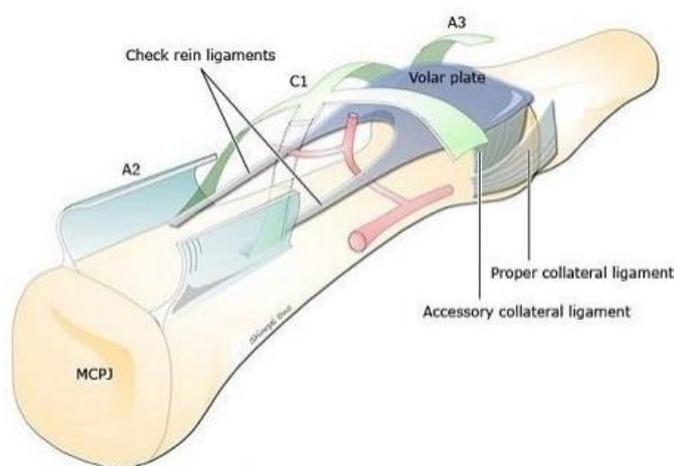


Figure 2: Plan of an antero-lateral view of the PIP

MATERIEL AND METHODS

Our work concerns the patient M.K, a 41-year-old patient, baker, right-handed, victim of a work accident causing blunt trauma in the 5th finger of the left hand. The patient did not consult initially, he reduced the dislocation of his IPP himself according to

his words without any radiological evidence being brought back. The patient consulted after 18 days. A reduction by external maneuver of the dislocation was attempted without success, which led us to admit the patient to the operating room for exploration and bloody reduction of the dislocation.



Figure 3: X-Ray of the IPP pure dislocation (face)



Figure 4: X-Ray of the posterior dislocation of the IPP

RESULTS

The patient was admitted to the operating room after failure of the maneuver to reduce the dislocation. Under loco regional anesthesia, the surgical intervention began with placement of a gloved tourniquet at the root of the fifth finger. The surgical

approach was an anterior approach. After skin and subcutaneous incision, the volar plate was visible.

The palmar plate, also called glenoid fibrocartilage, is located on the anterior surface of the IPP. Its proximal insertion is an arciform cutout with at each of its ends on the sides a brake, which attaches to the

neck of P1 downstream of the pulley A2: the "check-kidneys".

Its distal insertion on the base of P2 is the strongest, especially on its lateral parts.

The surgical exploration revealed an incarceration of the palmar plate which we freed then

we proceeded to a section of the check-kidneys which allowed us to free the joint, to reduce the dislocation. Then we completed the surgery by placing an arthrorysis pin, given the unstable nature of the reduction, a pin which will be removed between the 30th and 35th day and then rehabilitation will begin.



Figure 5: Peroperative image with the volar plate incarceration



Figure 6: Peroperative image with the volar plate incarceration



Figure 7: Peroperative image with the visible flexor tendons



Figure 8: Arthroscopy of the IPP and the IPD of the 5th finger

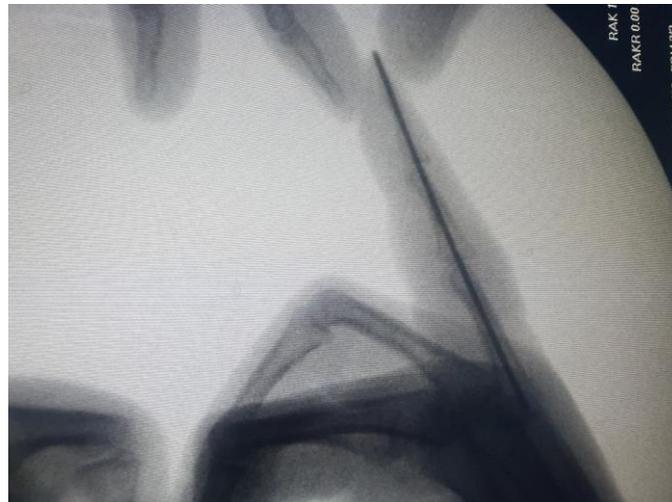


Figure 9: Profile X-Ray of the pin

DISCUSSION

The volar plate is a fibro-cartilage located anterior to the proximal interphalangeal joint.

It is inserted on P2 distally and on P1 proximally via the “Check Kidneys” and forms, with the lateral ligaments and the flexor sheath, the key to the stability of the PIP.

The functional imperative of the palmar plate is twofold:

- Avoid hyperextension of the PPI
- Do not limit the range of flexion

There is therefore a hinge system allowing both tensioning in extension and proximal plication during flexion.

They most often occur on a mechanism in hyperextension with frequent appearance of a hematoma.

The treatment can be done orthopedically (most often) or surgically (by reinsertion of the plate in cases of tearing of the palmar plate).

The essential risk after such a trauma is the STIFFNESS in flexion of the PIP.

It is therefore advisable to prevent this risk by carrying out an EARLY ACTIVE MOBILIZATION (in rehabilitation AND in self-rehabilitation at home... See specific exercises to be carried out until tension and WITHOUT pain, after consulting your doctor and/or physiotherapist).

The orthotic treatment is composed of two elements:

- A syndactyly preserved during the day. This splint connects the affected finger to the adjacent finger, allowing the patient to actively move under protection.
- A nocturnal orthosis molded in full extension of the IPP and IPD in cases of severe sprain.

The combination of this nocturnal orthosis with a compression bandage can be indicated to fight

effectively against trophic disorders (which can be a source of stiffness).

After 3 to 6 weeks (depending on the presence of inflammatory signs), a dynamic orthosis can be performed if the tendency to flexum is effective.

In cases of irreducible retraction of the palmar plate, surgery is possible and consists of releasing the "Check Kidneys" ligaments.

The treatment of these lesions must in any case be early, because when a flossum is installed, it is very difficult to reduce and surgery may then become inevitable...

CONCLUSION

Sprains (stretching of the ligaments) and finger dislocations (dislocation of the joint) are common, especially in sports.

These lesions should never be neglected because left untreated or badly treated, they can lead to sequelae.

Rupture of the internal ligament at the base of the thumb (metacarpophalangeal joint) is common in skiing. The thumb undergoes a lateral constraint by the strap or the stick, which remains blocked on the ground. When the ligament is completely ruptured, which can be confirmed or denied on examination by the surgeon of the hand and with the help of x-rays, an intervention is essential in order to suture the ligament. Otherwise, the risk is to see an instability of this joint appear, preventing the gripping of bulky objects.

At the level of the other fingers, the sprains are most often benign and are treated by equipment. However, the joint will remain large and painful for several months.

Complete dislocation of the intermediate joint (proximal interphalangeal joint) is potentially serious

because it may involve a tendon lesion and result in a buttonhole deformity. Here again, careful treatment with an orthosis limits this risk.

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