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Case Report

Irreducible Radial Dislocation of the Proximal Interphalangeal Joint of a Finger



不能復位的近端指間關節橈骨方向脫位

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ABSTRACT

Dislocations of the proximal interphalangeal joint (PIPJ) are often easily reduced with closed reduction and manipulation. Irreducible PIPJ dislocations are rare. They can be caused by soft tissue interposition, with interposition of the lateral band being very rare. Clinical signs may be nonspecific, with subtle changes on imaging. In our case, we highlight the clinical signs, imaging, and operative findings in an irreducible radial dislocation of the PIPJ.

中文摘要

近端指間關節脫位 (PIPJ dislocation) 往往很容易用閉合復位來治療。不能復位的近端指間關節脫位是罕見的。它們可以由軟組織插入引起的，而當中由於側帶(lateral band)插入引起的是非常罕見。臨床表徵上可以沒有特異性，影像上也可以只有細微的變化。在我們的例子中，我們特別指出了不能復位的近端指間關節橈骨方向脫位的臨床症狀，影像及手術的發現。

Introduction

Dislocations of the proximal interphalangeal (PIP) joint of the finger are fairly common and can often be reduced easily with closed reduction and manipulation. On rare occasions, the PIP joint (PIPJ) dislocation may prove to be irreducible by closed methods. This may be due to soft tissue interposition from either the central extensor mechanism or the lateral bands. In these instances, open reduction is indicated to reduce the dislocation and repair the affected structures. The physician must remain vigilant in these injuries as the joint incongruity may prove to be subtle on imaging.

Case report

A 30-year-old right-hand-dominant man injured his left index finger at a construction site. A metal cutter fell onto his left index finger whilst he was working. There was pain and swelling localised to the index finger. There was no open injury. On consultation at the emergency department, a diagnosis of PIPJ subluxation was made, and closed reduction was attempted under a digital block. The

emergency department physician reviewed the postreduction films and noted that it was partially reduced. A referral to the hand specialist clinic was made.

The patient consulted the hand specialist clinic 9 days after the injury. The examination revealed a left PIPJ swelling and tenderness, with radial deviation of the finger. The ulnar collateral ligament (UCL) was tender and unstable, with no end point. The patient was unable to fully extend or flex his index finger. X-ray scans revealed no fractures, with the PIPJ seemingly reduced (Figure 1). UCL disruption was suspected, and the patient was offered surgery for UCL reconstruction.

Prior to open reduction, X-ray scanning was done with an image intensifier intraoperatively. A subtle incongruity of the PIPJ was noted. Hence, an open reduction was performed through an ulnar midlateral incision over the left index finger PIPJ in view of the suspected UCL disruption. The operative findings revealed that the ulnar lateral band was torn from the central band and had subluxed volar-ulnarly to lie interposed within the joint (Figure 2). The UCL was torn from the distal attachment and interposed between the two parts of the extensor tendon. Reduction was easily achieved after removing the lateral band from within the joint space (Figure 3). The joint was then pinned with a 1.25-mm K-wire (Figure 4). The collateral ligament was repaired with a minibone

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Figure 1. Anteroposterior X-ray showing radial subluxation of the proximal interphalangeal joint of the index finger after attempted closed reduction.

anchor (Mitek Mini Lock Anchor system (Mitek Surgical Products, Inc, 57 Providence Highway, Norwood, MA, USA)). The lateral band was repaired to the central slip. The patient was started on early hand therapy to move the distal interphalangeal joint (DIPJ) and, after the removal of the K-wire, the PIPJ. The K-wire was removed 1 month later, where it was noted that the patient had a stable PIPJ of the left index finger.

Discussion

Dislocation of the PIPJ is a common injury and can often be treated with closed reduction. The PIPJ can be dislocated in a palmar, dorsal, or lateral direction.^{1,2} In rare instances, closed reduction may fail owing to the interposition of soft tissue within the PIPJ. The structures that can hinder reduction include the



Figure 2. Lateral slip interposing in the interphalangeal joint, with complete rupture of the ulnar collateral ligament.

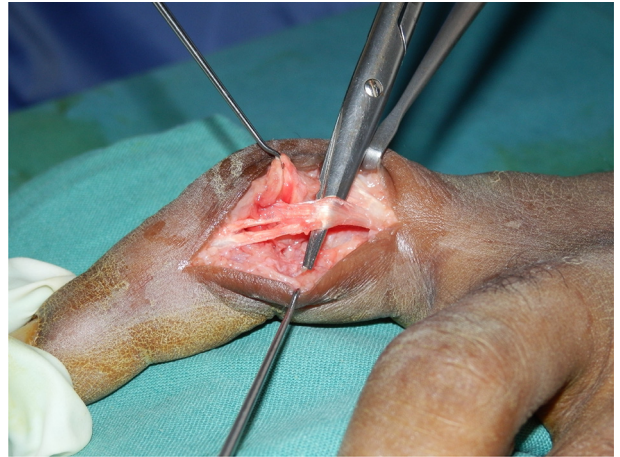


Figure 3. Lateral slip delivered, with subsequent ease of reduction of the interphalangeal joint.

central extensor slip, lateral bands, flexor tendon, and volar plate.^{1,2} The literature shows several case reports of irreducible dorsal or palmar dislocation of the PIPJ secondary to the soft tissue interposition.^{1–3} The irreducible lateral dislocation of the PIPJ is rare. To our knowledge, there have been no reports of irreducible radial dislocations of the PIPJ secondary to lateral band interposition.

Patients who suffer dislocations of the PIPJ may present with pain and swelling of the affected finger. Clinically, the patient may have the affected finger in flexion, with a reduction of range of motion. A detailed clinical examination will reveal a reduction in both active and passive range of motions. In addition, the lateral collateral ligaments are often disrupted in lateral dislocations, resulting in the lateral deviation of the joint with instability. Radiographic investigations such as anterior–posterior and lateral X-rays of the PIPJ should be obtained to confirm the dislocation.



Figure 4. Anteroposterior X-ray showing successful open reduction and K-wire stabilisation of the interphalangeal joint of the index finger.

Closed reduction of a PIPJ dislocation can be attempted in the emergency department setting. After a successful closed reduction, there should be a reasonable reduction in pain, with some increase in range of motion of the PIPJ. A subsequent attempt at closed reduction can be performed if the initial attempt is unsuccessful. However, as most PIPJ dislocations are easily reduced with closed reduction, unsuccessful attempts at reduction should alert the physician to the possibility of an irreducible dislocation secondary to soft tissue interposition. If soft tissue interposition is suspected, multiple attempts at closed reduction should not be performed, as the likelihood of successful closed reduction is low and may result in further soft tissue injury.

A postreduction X-ray should be obtained. X-ray findings may be subtle. In the absence of fractures, the X-ray of the affected finger should be scrutinised for joint congruity. Comparisons between the other finger PIPJs can also assist the physician in picking up signs of irreducible dislocation after an attempt at closed reduction. A stress test may prove useful in cases of collateral ligament disruption. In equivocal cases, magnetic resonance imaging has been shown to not only confirm suspicions, but also to identify the soft tissue that is interposed within the joint.⁴

Clinical signs and radiological investigations may be subtle in some cases. The inability to identify a failed reduction may lead to loss of motion, pain, chronic laxity, and fixed flexion deformity (chronic boutonnière deformity).⁵ It is thus important to have a

high index of clinical suspicion and obtain prompt diagnosis. Early referral to a hand specialist should be made in any suspected case.

Open reduction to remove the interposed tissue is the treatment of choice in irreducible dislocations of the PIPJ. Once the soft tissue is removed, reduction of the joint should be successful. The collateral ligaments, extensor tendon, and lateral bands should be repaired. The use of suture anchors may be required for secure repair.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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