SHORT REPORT

Palmar dislocation of the proximal interphalangeal joint—an injury not to be missed

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Abstract

Palmar dislocations of the proximal interphalangeal (PIP) joint are associated with long term complications if suboptimally treated. Six cases of palmar dislocation of the PIP joint are presented and a systematic approach in the diagnosis and management of such injuries in the accident and emergency department is described.

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Injuries to the proximal interphalangeal (PIP) joint are common in the accident and emergency (A&E) department. Such injuries vary from soft tissue and ligamentous injuries to joint subluxations, dislocations, and fracture dislocations. Whereas posterior (dorsal) PIP joint dislocations have been traditionally managed in the A&E department by closed reduction and neighbour strapping, palmar dislocations and fracture dislocations of the PIP joint are less common and constitute entirely different injuries that do not usually respond to conservative treatment. In this report we emphasise the importance of identifying which if

unrecognised, misdiagnosed, or only casually treated may lead to residual long term disability and disfigurement (chronic boutonnière deformity). Even when promptly recognised and effectively treated, some permanent impairment of finger mobility may still occur.¹

Patients and methods

Six patients presented to our two A&E departments between April 1996 and April 1997 with palmar dislocation of the PIP joint. There were five male and one female patients with a mean age of 42.6 years (range 19–56). The mechanism of injury was forced hyperflexion of the PIP joint resulting from a fall (three cases) and as a result of fighting (three cases). All six cases presented to the A&E department within 24 hours of their injury. Diagnosis was made upon clinical examination and radiological findings on before and after reduction radiographs (fig 1). All six cases were treated in the A&E department by closed reduction under digital nerve block and neighbour strapping for an average period of two weeks, followed by dynamic extensor splintage for a further two to three weeks. Passive and active motion of the distal interphalangeal joint was encouraged to prevent subluxation of the lateral bands and joint stiffness. Upon one year follow up all six patients presented with a residual 42°–45° fixed flexion deformity at the PIP joint and a range of flexion up to 110° (fig 2).

Classification

Palmar dislocation of the PIP joint is present when the middle phalanx is displaced anterior to the proximal phalanx at the level of the PIP joint. Historically three types of palmar PIP joint dislocations have been described by various authors,^{2–4} but more recently it has been suggested that these injuries form a subgroup of acute boutonnière deformities.⁵

(1) Simple palmar dislocation of the PIP joint: this usually results in disruption of at least one collateral joint ligament and avulsion of the central slip of the extensor tendon.²

(2) Rotatory palmar dislocation of the PIP joint in which the condyle of the head of the proximal phalanx is buttonholed between the lateral band and the central slip of the extensor tendon, both of which remain intact often rendering the joint irreducible.³

Figure 1 True lateral radiograph of a palmar dislocation of the PIP joint. Note the position of the middle phalanx in relation with the proximal phalanx.

Figure 2 Lateral radiograph of the same patient displaying a typical chronic boutonnière deformity resulting from a previous palmar dislocation of the PIP joint.

(3) Palmar dislocation of the PIP joint in association with central slip attachment fracture, which represents a spectrum of injuries, ranging from a traumatic boutonnière deformity to the anterior fracture dislocation of the PIP joint that can be grossly unstable.⁴

Discussion

A systematic approach to the examination of the PIP joint with inspection, palpation, and movement is essential to establish the diagnosis and instigate optimum treatment. Pre-reduction radiographic investigations are mandatory in differentiating volar from dorsal PIP joint injuries. Two at right angle views of the PIP joint are necessary, but ideally a true lateral film should be aimed for.⁶ A central slip attachment fracture of the dorsal third of the articular surface of the middle phalanx may be visible on the lateral radiograph.⁷ Re-examination after reducing the dislocation under digital block is also vital but often not undertaken in the A&E department. A radiograph of the finger after reduction should also be taken to ensure that joint congruity is maintained.

It is our belief that it is safe A&E practice to treat palmar PIP joint dislocations by closed reduction under digital block anaesthesia followed by extensor splintage. Extensor splints position the PIP joint in full extension, reducing the separation of the ends of the central slip of the extensor tendon and allowing repair of the structure at the tendon's normal length. Early mobilisation as well as passive or active exercises of the distal interphalangeal joint should be encouraged to prevent joint stiffness and late development of a boutonnière deformity. Whereby closed reduction is not possible due to soft tissue interposition in the PIP joint, as in the case of rotational PIP joint dislocation, formal exploration and open reduction of the joint may be necessary. Similarly, open reduction may be necessary when there is gross displacement of a large dorsal fragment rendering the joint unstable as in the case of anterior fracture dislocation of the PIP joint.⁵

Although an argument can be made for splinting the PIP joint in full extension without surgical repair of the central slip after reduc-

tion of the volar dislocation of the PIP joint,⁶ other authors advocate prompt open reduction, primary reconstitution of the ruptured structures, and fixation of the PIP joint soon after injury to prevent the development of joint contracture.^{3,8,9} As there are no randomised prospective studies that describe the ideal method of treatment of palmar dislocations of the PIP joint, the final decision whether to treat surgically or non-surgically depends on the hand surgeon and the patient involved. An important point to be emphasised is that all cases of palmar dislocation of the PIP joint after reduction in the A&E department should be followed up by a hand surgeon within a few days to expertly assess central slip function.

Conclusion

Volar PIP joint dislocations are associated with serious and disabling soft tissue injuries, which are not commonly recognised as such and are often treated inadequately. Careful clinical assessment as well as before and after reduction radiographs of the involved finger is the key to recognition of palmar PIP joint injuries. Such injuries can be safely treated in the A&E by closed reduction and extensor splintage until a definite treatment plan is made by an orthopaedic hand surgeon.

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