

Case Report: A Case of Bony Mallet Finger Managed by Delta Frame

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Abstract: Mallet finger is the term usually applied to extensor avulsion fractures. However, this entity may also be caused by distal extensor tendon ruptures. Either one result in an inability to extend the DIP joint. This injury results in the inability to extend the distal phalanx. The treatment remains controversial. In general, it is guided by the amount of articular surface involved in the fracture. We have presented a report of 32 year old female with bony mallet injury being treated with closed reduction and delta frame application. The patient had good bony union and functional outcome after 6 weeks.

Keywords: Bony mallet, delta frame

1. Introduction

Mallet finger injuries are named for the resulting flexion deformity of the fingertip, which resembles a mallet or hammer. Mallet finger injuries are caused by the disruption of the extensor mechanism of the phalanx at the level of the distal interphalangeal joint, usually due to a forced flexion at the distal interphalangeal joint. A mallet fracture occurs when the extensor tendon also causes avulsion of the distal phalanx. There are three subtypes of mallet fractures based on the age of the patient and the percent of the articular surface of the distal phalanx involved.

The distal extensor tendon is ruptured. The rupture occurs when the distal phalanx of a finger is forced into flexion while being actively extended. The extrinsic extensor tendon originates in the forearm and courses over the metacarpophalangeal joint, has an indirect attachment to the proximal phalanx, and finally attaches to the distal phalanx. These tendons are responsible for the extension of the digits. [1] A mallet finger injury occurs when the extensor tendon is disrupted. In contrast, a mallet fracture occurs when the tendon injury causes an avulsion fracture of the distal phalanx.

Doyle's Classification of Mallet Finger Injuries:

1. Closed injury, with or without small dorsal avulsion fracture
2. Open injury (laceration)
3. Open injury (deep abrasion involving skin and tendon)
4. Mallet fracture

The diagnosis of mallet finger injuries is usually a clinical diagnosis. Patients typically present with the history of a forced flexion injury. However, this is not always the case. Patients usually complain of pain, flexion deformity, and/or difficulty using the affected digit. In general, closed mallet fractures involving less than one-third of the articular surface, without associated distal interphalangeal

subluxation can be managed non-surgically with splinting as the mainstay of treatment. Surgical management is generally accepted for mallet fractures involving greater than one-third of the articular surface and for fractures with associated joint subluxation. The two major complications from mallet finger injuries and mallet fractures are residual extensor lag and swan neck deformities.

2. Case Presentation

A 32 year old female presented to kurla babha hospital with history of trauma to left hand index finger 7 days back. She had complaints of pain in the index finger and deformity in the finger. On examination her index finger was flexed at distal interphalangeal joint and it was very tender. It was not getting extended even passively. She was advised to get radiograph of her hand. Her radiograph revealed bony mallet fracture of the distal phalanx of index finger along with subluxation of DIP joint. Since the fracture was not getting reduced she was advised surgical intervention.

All her routine blood investigations were carried out and she was admitted in ward to be posted for surgery the following day. Wrist block was given and her left hand was prepared painted and draped under strict aseptic precautions. After the effect of block one k wire was inserted across the proximal fragment of the fracture and it was extended to the opposite side. The opposite side of k wire was hooked and it was then withdrawn until it just reaches the opposite cortex. Other k wire is inserted along the distal fragment of the distal phalanx and it is bent in hooked shaped to attach to the proximal wire. This creates a delta frame which helps to keep the fracture reduced and the patient can mobilise the DIP joint so there are reduced chances of stiffness.



Figure 1: preop x ray showing bony mallet fracture



Figure 2: post op ap image showing reduced fracture with frame



Figure 3: post op oblique x ray

3. Discussion

Dorsal extension block pinning is widely performed to treat acute bony mallet fingers. It is also useful for treating bony

mallet fingers within 5 weeks after injury; however, ORIF are recommended in chronic cases because satisfactory reduction is difficult to achieve if fibrous tissue is present at the fracture site. During open surgery, the surgeon can perform curettage under direct visualization. However, the risks of breaking bone fragments, adhesion of extensor tendons, deformation of nails, or skin irritation are greater with open surgery than with closed surgery. In our patient we have used closed reduction and frame application to treat mallet fracture which has given good outcome.

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