Daniel Anderson

Mallet finger

Management and patient compliance

Background
Mallet finger is a flexion deformity of the finger resulting from injury to the extensor mechanism at the base of the distal phalanx.

Objective
This article discusses the current clinical assessment and appropriate management of mallet finger injuries.

Discussion
Mallet finger usually results from forced flexion of an extended finger. Treatment can be difficult as patient compliance is essential, and if not treated appropriately the injury can lead to permanent deformity. Patients will present with a flexion deformity of, and inability to actively extend, the distal interphalangeal joint. Closed mallet finger injuries are managed in a strict extension or hyperextension immobilisation splint for 8 weeks. Surgery is reserved for injuries involving fracture to greater than 30% of the articular surface, volar subluxation of the distal phalanx, avulsed fragments that fail reduction, injuries failing conservative management, and absence of full passive extension of the joint. Early referral is recommended if there is any concern.

Keywords: orthopaedics, hand; musculoskeletal diseases; specialties, surgical

CPD

Mallet finger is a flexion deformity of the finger that results from injury to the extensor mechanism at the base of the distal phalanx. It can involve either a bony avulsion injury of the distal phalanx or a rupture of the extensor tendon with no bony involvement (*Figure 1*).[1] Other terms used are 'baseball finger' and 'drop finger'.[2] The injury usually results from a blow causing forced flexion of an extended finger.[1] This is a difficult injury to treat, and if not treated appropriately can lead to permanent deformity.

Patients with mallet finger rarely present with functional disability. As a result, they may choose to ignore the deformity when faced with a long treatment plan. However, when ignored, mallet finger may progress to form a 'swan neck' deformity of the involved finger.[2] This injury is more common in men, with the middle finger most commonly involved, followed by the little finger.[3] Around two-thirds of mallet finger injuries occur in the dominant hand.[4]

Clinical examination

Examination should start with initial observation looking for any deformities, both with the hand at rest and in flexion (interphalangeal and metacarpophalangeal joints). Sensation should be examined next, followed by active movements of all joints in the finger. This is followed by examination of passive movements and if appropriate, resisted movements to assess tendon function.

Examination of an acutely injured mallet finger may reveal bruising over the dorsum of the distal interphalangeal joint (DIPJ). However, these injuries often present with no bruising, swelling or tenderness over the DIPJ.[1] All patients will exhibit a flexion deformity of the DIPJ and be unable to actively extend the DIPJ. A mallet finger flexion deformity will be correctable with passive movement to full extension. Patients will rarely complain of a functional disability because there are few activities that require full digital extension.[5] Plain X-ray (anteroposterior, lateral and oblique) is mandated in any patient with a suspected mallet finger injury to assess for bony involvement which is reportedly present in one-third of patients.[6]

It is also important to remember that in cases where the injury has occurred due to trauma, patients should be appropriately examined to ensure they have not suffered any other injuries.

Management

Closed mallet finger injuries are treated with an immobilisation splint in extension, or slight

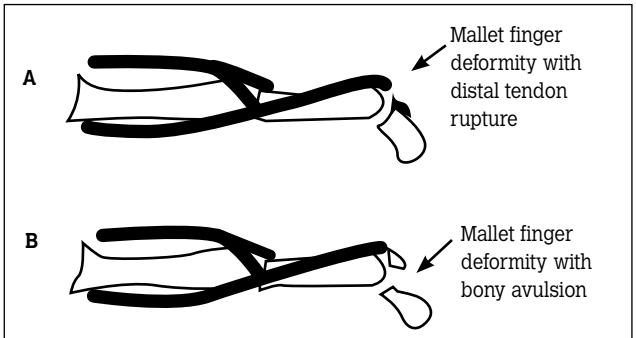

Figure 1. Mallet finger

hyperextension, full time for 8 weeks. If the patient removes the splint and the finger flexes for any reason, the 8 weeks must start again.[2] It is important that the patient understands the importance of keeping the finger extended for the entire 8 weeks. A Cochrane review in 2004[7] found that the most important factor in the success of splint treatment is that of patient compliance.

During splint changes, patients often find it difficult to maintain their finger in extension. One method of maintaining extension is by resting the finger on a flat table. Another option is for the patient to have assistance with splint changes. The major risk involved in splint treatment is that of skin breakdown. As such it is important for patients to 'air' out their finger for a short period between splint changes.[7] Splints should only immobilise the DIPJ, avoiding the risk of stiffness at proximal joints.[1]

There are many different splints in use, one of the most popular is the Stack splint.[8] A Cochrane review in 2008[9] found insufficient evidence to assess any difference between splints, and it appears outcomes are similar between different splints. They did find that the splint being robust was an important factor to consider.

If the patient is able to compete in their sporting pursuits with a splint in situ then this may be allowed. However, close follow up, such as fortnightly review, is recommended.[10] Once the 8 weeks of splinting is complete the finger should be re-examined. If active extension is present, splinting may be restricted to high risk times such as during sleeping, athletic performance or manual work. Splinting can be successful, even if presentation is delayed for up to 3 months postinjury.[11,12]

It was suggested by Crawford[13] that surgery should be delayed until at least 6 months postinjury to ensure maximum spontaneous improvement has been made. Pulvertaft[14] suggested that of the 40% who fail splint management, half will spontaneously improve sufficiently to be acceptable.There is a significant risk of complication involved with surgery. Some of the complications described include infection, permanent nail deformities, joint incongruity, fixation failure and bony prominence.[4]

Mallet finger injuries that involve avulsion fractures to greater than 30% of the articular surface, or injuries with volar subluxation of the distal phalanx should be treated surgically.[15] Other indications for referral include inability to reduce the avulsed segment, injuries that fail conservative management,[16] and absence of full passive extension of the joint as it may be caused by soft tissue or bony entrapment in the joint.[17] If any doubt exists regarding the management of patients with mallet finger injuries, referral to a specialist hand surgeon or sports physician is recommended.

Summary

- Mallet finger is a flexion deformity of the finger that results from injury to the extensor mechanism of the distal phalanx.
- Without appropriate treatment it may lead to a permanent flexion deformity of the finger.
- Mallet finger should be managed in an extension splint full time for 8 weeks.
- The most important issue with splinting is compliance; any flexion during the 8 week period requires the period of splinting to restart from zero.
- Surgery is reserved for cases involving fractures to greater than 30% of the articular surface, injuries with volar subluxation of the distal phalanx, injuries where the avulsed segment cannot be reduced, injuries failing conservative management and injuries where full passive extension is absent.
- Referral to a hand specialist or sports medicine physician may be appropriate.

Author

Daniel Anderson MBBS, BAppSc(EXSS), is a principal house officer, Department of General Surgery, Princess Alexandra Hospital, Brisbane, Queensland. daniel.anderson@health.qld.gov.au.

Conflict of interest: none declared.

References

1. Wang QC, Johnson BA. Fingertip injuries. Am Fam Physician 2001;63:1961–6.
2. Perron AD, Brady WJ, Keats TE, et al. Orthopedic pitfalls in the emergency department: closed tendon injuries of the hand. Am J Emerg Med 2001;19:76–80.
3. Stark HH, Boyes JH, Wilson JN. Mallet finger. J Bone Joint Surg Am 1962;44:1061–8.
4. Stern PJ, Kastrup JJ. Complications and prognosis of treatment of mallet finger. J Hand Surg Am 1988;13:329–34.
5. Brzezienski MA, Schneider LH. Extensor tendon injuries at the distal interphalangeal joint. Hand Clin 1995;11:373–86.
6. Lairmore JR, Engber WD. Serious, often subtle, finger injuries. Avoiding diagnosis and treatment pitfalls. Phys Sportsmed 1998;26:57–69.
7. Handoll HH, Vaghela MV. Interventions for treating mallet finger injuries. Cochrane Database Syst Rev 2004; Issue 3:CD004574.
8. Stack HG. Mallet finger. Hand 1969;1:83–9.
9. Handoll HHG, Vaghela MV. Interventions for treating mallet finger injuries (review). Cochrane Database Syst Rev 2008; Issue 3 Art No. CD004574.
10. Kovacic J, Bergfeld J. Return to play issues in upper extremity injuries. Clin J Sport Med 2005;15:448–52.
11. Palmer RE. Joint injuries of the hand in athletes. Clin Sport Med 1998;17:513–31.
12. Garberman SF, Diao E, Peimer CA. Mallet finger: results of early versus delayed closed treatment. J Hand Surg 1994;19A:850–2.
13. Crawford GP. The molded polythene splint for mallet finger deformities. J Hand Surg 1984;9A:231–7.
14. Pulvertaft RG. Mallet finger [discussion]. J Hand Surg 1962;13B:115–7.
15. McCue FC, Meister K. Common sports hand injuries: an overview of aetiology, management and prevention. Sport Med 1993;4:281–9.
16. Warren RA, Kay NRM, Ferguson DG. Mallet finger: comparison between operative and conservative management in those cases failing to be cured by splintage. J Hand Surg 1988;13B:159–60.
17. Leggit JC, Meko CJ. Acute finger injuries: part 1 tendons and ligaments. Am Fam Physician 2006;73:810–6.

correspondence **afp@racgp.org.au**