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ARAŞTIRMA

Results of surgical treatments in mallet finger deformity

Ali Güleç, Harun Kütahya, Burkay K.Kacıra, Onur Bilge, Serdar Toker, Mustafa Yel

Necmettin Erbakan Üniversitesi, Meram Tıp Fakültesi, Ortopedi ve Travmatoloji AD. Konya, Türkiye

Abstract

Introduction: **Mallet finger is a common injury and is frequently the result of direct trauma to the tip of an extended finger (forced flexion) or secondary to a laceration over the dorsal distal interphalangeal (DIP) joint of a digit, resulting in a DIP extensor lag. The injury may result from either tendon disruption or a fracture of the distal phalanx and can be treated by splinting or surgery.**

Method: **Between January 2006 and January 2011, 53 mallet finger were treated in our clinic. We treat 41 patients (without open injury) conservative methods (plastic stack splinting and aluminum stack splinting). In 16 of these; we had succesfull results. Of those 25 patients who failed with conservative treatment and 12 patients who had open wounds were treated by surgical methods. We used Y or H type incisions on DIP joint.**

Results: **The study involved 37 patients (25 males, 12 females; mean age years; range 2 to 64 years) with 38 mallet finger deformity. 25 patients (male (%67.6), 12 patients female (%34.4) (one of them bilateral) who had poor results were and also 12 patiens who had open injury treat with surgical treatment.**

Conclusion: **Although mallet finger might appear as a minor injury, over a quarter of the patients with a mallet injury have been reported to be off work during a 6-week period. In addition, activities, such as sports, are often avoided during the first weeks after the trauma (3). An anatomical reduction is essential in mallet fractures. Open reduction and internal K-wire fixation can be preferred due to its low complication rate and ease of application in patients whose mallet deformity cannot be treated by closed reduction.**

Key words: Mallet finger, mallet fracture, K wire fixation

Yazışma Adresi:

Dr. Serdar Toker
Necmettin Erbakan Üniversitesi, Meram Tıp Fakültesi, Ortopedi ve Travmatoloji AD Baş ve Üst ekstremite Cerrahi Kliniği, Konya, Türkiye
Telefon: 03322236230
E-mail: tokerserdar@hotmail.com

Çekiç parmak deformitesinde cerrahi tedavi sonuçları

Özet

Amaç: **Çekiç parmak deformitesi yaygın bir yaralanmadır ve ekstansiyon eksikliğiyle sonuçlanan, genellikle ekstansiyonda parmak ucunun doğrudan darbe alması sonrası fleksiyona zorlanması ya da parmakta distal interfalangeal (DİF) eklemin laserasyonu sonucu oluşur. Yaralanma tendonun kesilmesi , distal falanks kırığı sonucu olabilir ve splintleme veya cerrahi olarak tedavi edilebilir.**

Metod: **Ocak 2006- Ocak 2011 yılları arasında 53 çekiç parmak deformitesi kliniğimizde tedavi edildi. 41 hasta (açık yaralanması olmayan) konservatif metodlarla (plastik ve aluminyum stack splintleme) tedavi edildi. 16'sında başarılı sonuç elde edildi. Konservatif tedaviden fayda görmeyen 25 hasta ve açık yaralanması olan 12 hasta cerrahi olarak tedavi edildi. Y ve H tipi insizyonlar kullanıldı.**

Sonuçlar: **Çalışmaya 38 çekiç parmak deformitesi olan 37 hasta(25 erkek, 12 kadın, 30.8 yaş ortalaması ve 2-64 yaş aralığı) dahil edildi. Crawford kriterlerine göre 30 hasta (%81.1) mükemmel, 4 hasta (%10.8) iyi, 2 hasta (%5.4) orta ve 1 hasta (%2.7) kötü sonuç olarak değerlendirildi. 1 hastada yüzeyel enfeksiyon, 1**

hastada cilt nekrozu ve 1 hastada rekürren deformite oluştu.

Tartışma: **Çekiç parmak deformitesi minör yaralanma gibi görünmesine rağmen hastaların dörtte birinde yaralanmanın 6 haftalık dönemde işgücü kaybına neden olduğu bildirilmiştir. Ayrıca travmadan itibaren spor gibi aktivitelerden kaçınılmalıdır. Biz bu çalışmada açık yaralanması olan ve kapalı yöntemlerden fayda görmeyen çekiç parmak deformitesi olan hastaları cerrahi olarak tedavi ettik. Açık redüksiyon ve K teli tespiti etkili ve kolay metoddur.**

Anahtar kelimeler: Çekiç parmak, mallet kırığı, k tel tespit

Mallet finger is a common injury and is frequently the result of direct trauma to the tip of an extended finger (forced flexion) or secondary to a laceration over the dorsal DIP joint of a digit, resulting in a DIP extensor lag.[1] The injury may result from either tendon disruption or a fracture of the distal phalanx and can be treated by splinting or surgery.

Methods

Between January 2006 and January 2011, 53 mallet fingers were treated in our clinic. We treated 41 mallet fingers (without open injury) by conservative methods (plastic stack splinting and aluminum stack splinting). In 16 of these; we had succesfull results. Of those 25 mallet fingers which failed with conservative treatment and 13 mallet fingers (one of 12 patient have bilateral injury) with open wounds were treated by surgical methods. We used Y or H type incisions on DIF joint. In Doyle Type 4 injuries, the fractured fragment was reduced and fixed with one Kirshner wire while distal phalanx was in full extension. Type 1 and Type 3 injuries were treated by tendon repair. Finger splint was applied to all patients for 6 weeks and wires were extracted after rontgenographic evaluation at the end of the 6th week. All patients were taken into a rehabilitation programme.

Results

The number of surgically treated mallet fingers was 38 and sex distribution was 25 males (%67.6) and 12 females (%34.4) with mean age 30.8 years (range 2 to 64 years) (Table 1).

12 patiens who had an open injury and 25 patients who did not have succesful results with conservative methods were treated with surgical approach. According to the Doyle classification, 20 of 37 were type 1, 8 were type 3 and 9 were type 4. The ring was most effected finger with a rate of %36.8. The thumb was not effected. The numbers of effected fingers were 14 (%36.8), 13 (%34.2), 6 (%15.8) and 5 (%13.2) in ring, middle, little and index fingers respectively (Table 2). It was more commen in 3rd decade in males. According to Crawford criteria, 30 (%81.1) patients had excellent, 4 (%10.8) patients had good, 2 (%5.4) patients had fair and 1 (%2.7) patient had poor results. One patient had superficial infection, one had necrosis on incision and one had a recurren deformity.

Table 1. Demografic distribution

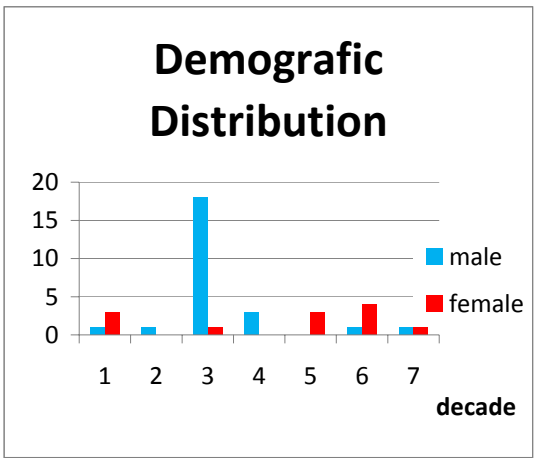
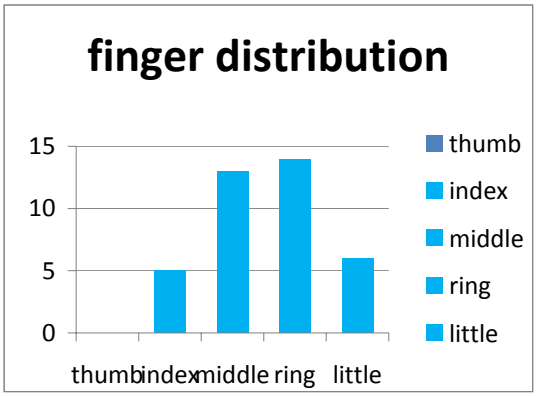


Table 2. Finger Distribution



Discussion

Although mallet finger might appear as a minor injury, over a quarter of the patients with a mallet injury have been reported to be off work during a 6-week period.[2] In addition, activities, such as sports, are often avoided during the first weeks after the trauma.[3] Furthermore, incorrect treatment can lead to

long-term complaints of joint dysfunction, pain, and deformities.[4]

Fig. 1. Mallet fracture.

Fig. 2. Anatomic reduction and K wire fixation.

In this study we also classically applied splints and K-wire fixation for 6 weeks and most of the patients were out of work and sport activities during this period.

There are many variations in the design of splints, but they all have in common that they hold the affected DIP joint in hyperextension, thus ensuring effective apposition of the ruptured terminal extensor tendon. The most common splint is the Stack splint made out of plastic.[5] One of the key factors in the success of external splinting is patient compliance.

In general conservative methods are useful for non-complicated mallet finger deformity however if these methods fail surgical treatment is recommended. Moreover an anatomical reduction is essential in mallet fractures. Open reduction and internal K-wire fixation can be preferred due to its low complication rate and ease in application in mallet fracture and in patients with unsuccessful conservative treatment results.[6] (Figure 1-2) Our first choice of treatment in closed injuries was also conservative methods. However twenty-five of 41 closed injuries that were attempted to be treated by conservative methods failed so we surgically treated them with 13 open injuries for which the surgical treatment was the first choice. Most controversy in the treatment of mallet injuries concerns the treatment of traumas with a large bone fragment involving the joint.[5] Although there are a number of studies that report their experience with different surgical methods,[7-14] none of these reports compare their results with a control group. Unfortunately we also did not make a comparison between the results of conservative and surgical procedures. This is a disadvantage of this study. However we can provide a 39.02% success ratio of conservative treatment in closed injuries whereas it is 97.3% for open surgery.

In this study we treated mallet finger deformity surgically in patients with open injuries and in patients of whose deformity could not be managed by closed methods. We think that in such circumstances, open reduction and K- wire fixation is a very useful and easy method to handle this problem.

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