편측 수부에서 발생한 다발성 골성 추지

노시영¹ · 유덕현² · 박진하¹ · 고성훈¹ · 김진수¹ · 이동철¹ · 이경진¹ · 홍민기¹

¹광명성애병원 성형외과, ²새손병원 성형외과

Multiple Bony Mallet on the Same Hand

Si Young Roh¹, Deok Hyeon Ryu², Jin Ha Park¹, Sung Hoon Koh¹, Jin Soo Kim¹, Dong Chul Lee¹,
Kyung Jin Lee¹, Min Ki Hong¹

¹Department of Plastic and Reconstructive Surgery, Gwangmyeong Sungae Hospital, Gwangmyeong, Korea

²New Hand Hospital, Daejeon, Korea

Mallet finger is a very common finger disease. However, it is very rare for mallet fingers to occur simultaneously on three fingers of the same hand. We report a case of mallet fingers in a 46-year-old female who sustained a fall during a running race. She was injured on the middle, ring, and little fingers. Radiographically, bone fragments were observed on the dorsal side of the distal phalanx base on the middle, ring, and little fingers. She underwent surgical treatment using the extension block method. Extension lag was observed in the fingers other than the little finger (middle finger: 5°, ring finger: 10°). However, evaluation using Crawford's classification revealed good results. Thus, provide data on the treatment of multiple mallet fingers on the same hand.

Key Words: Mallet finger, K-wire, Multiple, Extension

Mallet finger is a very common finger disease. It occurs mainly on the ring finger, middle finger, and little finger^{1,2}. In rare cases, there are two mallet fingers in one hand³. However, until now, to our knowledge, there have been no reported cases of three mallet fingers occurring simultaneously on one hand. Herein, we report a case of mallet fingers occurring on three ulnar fingers of the same hand and their successful treatment by surgical fixation.

CASE REPORT

A 46-year-old female fell on the ground during a running race. She was injured on the middle, ring, and little fingers. Radiographically, bone fragments were observed on the dorsal side of the distal phalanx base on the middle, ring, and little fingers with more than 30% of intra-articular involvement (Fig. 1). Five days after the injury, all three fingers were treated surgically by the extension block method (EBM) (Fig. 2). Single mallet fingers are usually treated with finger splints, but this case involved

Received August 19, 2019, Revised October 21, 2019, Accepted October 23, 2019

Corresponding author: Si Young Roh

Department of Plastic and Reconstructive Surgery, Gwangmyeong Sungae Hospital, 36 Digital-ro, Gwangmyeong 14241, Korea
TEL: +82-2-2680-7238, FAX: +82-2-2680-7755, E-mail: psczero@gmail.com, ORCID: https://orcid.org/0000-0002-8625-6124

Copyright © 2019 by Korean Society for Surgery of the Hand, Korean Society for Microsurgery, and Korean Society for Surgery of the Peripheral Nerve. All Rights reserved.
This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

three mallet fingers; thus, we applied a short arm splint. At this time, the index finger was movable and the splint was kept on for 10 days. Because of concerns about joint stiffness, we started passive range of motion (ROM) exercise starting from the 2nd week after surgery. K-wires on dorsal sides wire removed 3 weeks after surgery, and longitudinally fixated K-wires were removed 6 weeks after surgery. Finally, bone union was confirmed after

7 months (Fig. 3). During the outpatient visit 6 months after surgery, the ROM was good but extension lag was observed within 10° in all fingers (Fig. 4). According to Crawford's criteria, result as "Good" is defined as "0 to 10 degrees of extension loss, normal flexion, no pain"⁴. In this case, the condition is met.

Informed consent was obtained for the use of photographs from the patient in this study. The consent has been formally documented in the medical record.

DISCUSSION

Mallet finger can be divided into bony mallets and tendinous mallets. Conservative treatment with finger splints can be used for tendinous mallets. However, the appropriate treatment for bony mallet is still under discussion. The current literature describes several surgical and non-surgical methods for managing mallet finger injuries such as pull-out suture, extension block with K-wire or splinting without surgery. If the bone fragment is bigger than one-third the joint surface or subluxation is severe, the bone fragment may remain unstable or may malfunction. In these cases, surgery is usually performed. Without instability or severe joint involvement, non-surgical treat-

Fig. 1. A 46-year-old female with multiple bony mallet on the middle, ring, and little fingers. In each of the fingers, gap between the distal phalanx and the bone fragment are seen (white arrows).

Fig. 2. Immediate postoperative radiologic image: extension block method used in all fingers. (A) Anteroposterior view. (B) Lateral view.

Fig. 3. Follow-up radiologic image 7 months after surgery: bone union with attachment of bone fragment seen. (A) Anteroposterior view. (B) Lateral view.

Fig. 4. Six months after operation image. Minimal extension lag (5° - 10°) was found.

ment can be done. Gurnani et al.⁵ claimed that a bony mallet finger can also be treated using finger splints and conservative treatment^{5,6}. There is no significant difference in deformity or pain when comparing splinting and conservative treatment with surgical treatments. Although there are no significant differences in complications resulting from splinting and surgery, we preferred surgical treatment in our case. The splint should be maintained for six to eight weeks if surgical intervention is not performed. If an extension lag remains, surgical treatment should be done. Therefore, the treatment period will be longer. Patients also tend to feel uncomfortable with the splint; thus, they often unwind the splint. But if the splint is not well-maintained, unfavorable results could happen. For this reason, we believe that surgical treatment shortens the duration of treatment and is safer for patients.

Among surgical methods, closed reduction is preferred to open reduction in recent years. Among the closed reduction surgical methods, the EBM and direct pinning method (DPM) are used. EBM, developed by Ishiguro et al.⁷, is a good surgical method for treating mallet fingers⁸. However, it has been reported that complications, such as infection, joint failure, implant failure, and residual pain, can be increased when the K-wire is being fixed through the joint space. Recently, Han et al.⁹ also demonstrated

that DPM is superior in that it offers better improvements in extensor lag and motion range. However, direct pinning to bone fragments can cause bone fragments to break. In our opinion, it is also possible to reduce the extension lag if early removal of the percutaneously inserted K-wire through the distal extensor tendon is performed. For this reason, EBM is preferred in our case, although it will depend on the individual tendency of the surgeon.

To our knowledge, mallet fingers occurring in simultaneously in three fingers have not been reported. In our case, hyperextension seems to have occurred in the bony mallet fingers¹⁰. The mallet fingers occurred simultaneously on three fingers, but they were treated as if they occurred on one finger. Surgical treatment with EBM was performed, and satisfactory results were obtained without any complication. However, because the size of the bone fragment varies among fingers, there were different results in terms of extension lags. There was also more extension lag in middle finger due to lack of bone fragment reduction. In conclusion, this case provides data on the treatment of multiple mallet fingers on the same hand.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

REFERENCES

1. Alla SR, Deal ND, Dempsey IJ. Current concepts: mallet finger. *Hand (N Y)*. 2014;9:138-44.
2. Salazar Botero S, Hidalgo Diaz JJ, Benaïda A, Collon S, Facca S, Liverneaux PA. Review of acute traumatic closed mallet finger injuries in adults. *Arch Plast Surg*. 2016;43:134-44.
3. Degreef I, De Smet L. Multiple simultaneous mallet fingers in goalkeeper. *Hand Surg*. 2009;14:143-4.
4. Crawford GP. The molded polythene splint for mallet finger deformities. *J Hand Surg Am*. 1984;9:231-7.
5. Gurnani N, Hoogendoorn J, Rhemrev S. [Mallet finger: surgery versus splinting]. *Ned Tijdschr Geneesk*. 2014;158:A6941. Dutch.
6. Richards SD, Kumar G, Booth S, Naqui SZ, Murali SR. A model for the conservative management of mallet finger. *J Hand Surg Br*. 2004;29:61-3.
7. Ishiguro T, Itoh Y, Yabe Y, Hashizume N. Extension block with Kirschner wire for fracture dislocation of the distal interphalangeal joint. *Tech Hand Up Extrem Surg*. 1997;1:95-102.
8. Pegoli L, Toh S, Arai K, Fukuda A, Nishikawa S, Vallejo IG. The Ishiguro extension block technique for the treatment of mallet finger fracture: indications and clinical results. *J Hand Surg Br*. 2003;28:15-7.
9. Han HH, Cho HJ, Kim SY, Oh DY. Extension block and direct pinning methods for mallet fracture: a comparative study. *Arch Plast Surg*. 2018;45:351-6.
10. Kim JY, Lee SH. Factors related to distal interphalangeal joint extension loss after extension block pinning of mallet finger fractures. *J Hand Surg Am*. 2016;4:414-9.

편측 수부에서 발생한 다발성 골성 추지

노시영¹ · 유덕현² · 박진하¹ · 고성훈¹ · 김진수¹ · 이동철¹ · 이경진¹ · 홍민기¹

¹광명성애병원 성형외과, ²새손병원 성형외과

골성 추지는 수부에 발생하는 매우 흔한 질환이다. 그러나 편측 수부에서 세 손가락에 동시에 골성 추지가 발생하는 일은 극히 드물다. 우리는 달리기 시합 도중 넘어져 중지, 환지, 소지 동시에 골성 추지가 발생한 46세 여성환자에 대해 보고하고자 한다. 방사선상 원위지골 기저의 수배부에서 세 수지 모두 골편이 확인되었다. 신전 제한 방식을 통하여 수술적 치료를 시행하였다. 신전 지체는 모든 수지에서 10° 이내로 관찰되었다. 그러나 Crawford의 분류에 따라 평가하였을 때 좋은 수술적 결과를 보였다. 이에 우리는 편측 수지에서 다발성으로 발생한 골성 추지의 치료에 대한 수술적 경험을 보고하고자 한다.

색인단어: 골성 추지, K-wire, 다발성, 신전

접수일 2019년 8월 19일 수정일 2019년 10월 21일 게재확정일 2019년 10월 23일

교신저자 노시영

14241, 광명시 디지털로 36, 광명성애병원 성형외과

TEL 02-2680-7238 FAX 02-2680-7755 E-mail psczero@gmail.com

ORCID <https://orcid.org/0000-0002-8625-6124>