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Scientific/Clinical Article

Evaluation of written and video education tools after mallet finger injury



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ABSTRACT

Study Design: Prospective cohort.

Introduction: Successful nonoperative treatment of mallet finger injuries requires compliance to prolonged immobilization and understandable educational materials.

Purpose of the Study: This study evaluated the use of written and online video education tools after mallet finger injury.

Methods: After ethics board approval and informed consent, adults with an acute mallet finger injury referred to hand therapy were included. Standard nonoperative treatment was instituted with orthotic immobilization and verbal instructions, in addition to an education pamphlet and an online video link. A questionnaire regarding the educational materials was administered at the follow-up appointment.

Results: There were 61 patients (mean age, 42 ± 14 years). The middle ($n = 21$) and ring ($n = 22$) fingers were most commonly injured. All patients were fluent in English. Written instructions ($n = 57$) were used by more patients than the videos ($n = 30$). Comparing patients who viewed the video with those who did not, there were no differences ($P > .05$) in demographics (sex, age, education, work status, and second language). Both written and video instructions were reported as helpful; mean helpful score for the video was significantly ($P = .03$) higher than written instructions. Most patients preferred having written and video instructions, and both were easy to understand and convenient.

Discussion: In our study of patients with acute mallet finger injuries, written and video instructions were utilized and both were reported as helpful.

Conclusions: This study provides evidence of the usefulness of online videos as an educational aid and the opportunity for future investigations to improve patient access to education materials.

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Introduction

Injury to the extensor mechanism of the distal interphalangeal (DIP) joint can result in an inability to extend the distal phalanx and is termed mallet finger injury.¹ These types of injuries are common and vary in the degree of soft tissue and bony involvement.² Nonoperative management is often the primary initial approach and requires a prolonged 6–8 week period of immobilization.^{1,3} Successful treatment necessitates maintaining the DIP joint in extension during the period of immobilization, and strict compliance to this regime depends on patient understanding and

retention of information from educational materials and the hand therapist.

Different types and sources of educational materials regarding hand injuries, including mallet finger injuries, are available. Access to and use of these educational materials may vary regarding different hand pathologies and patient demographics.^{4–8} Factors that may affect the patient's understanding of these educational materials include language barriers, access, and learning strategies.^{7,9} Historically, written instructions have been used for patient education, but with increased access to electronic media and videos, different types of educational materials are available. Digital materials and videos have been reported for use in medical patient education and decision-making aids with consideration of health literacy and other specific patient factors.^{10–12} A systematic review of published studies showed that the effectiveness of treatment depends on adherence to hand therapy and orthosis wear.⁴ Understanding the treatment details and potential complications is paramount for optimal outcome, and therefore, patient education is

Conflict of interest: All named authors hereby declare that they have no conflicts of interest to disclose.

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an essential component of successful treatment. Previous studies have evaluated the use of different types of orthoses for the treatment of mallet finger injuries and the impact on treatment but have not evaluated the use of different types of educational materials.^{2,3}

The purpose of this study was to evaluate written and online video education tools for nonoperative treatment of a mallet finger injury. Our research question investigated: In adults with mallet finger injury, what is the use and patient perspective of written and online video education tools during nonoperative treatment?

Methods

After institutional ethics board approval and informed written consent, adults with an acute mallet finger injury referred to the hand therapy clinic were included in the study. We included adult patients (18–75 years) with a mallet finger injury who were less than 4 weeks after injury and excluded patients: (1) with a previous mallet finger injury or failed previous treatment; (2) unable to provide informed consent; or (3) were having ongoing management at another hand therapy clinic and not returning for care at our facility.

Standard nonoperative treatment for a mallet finger injury was instituted, which included immobilization of the DIP joint and verbal instructions. Patients were provided with a custom-made orthotic in the most suitable design either stack or trough (Fig. 1) dependent on the injury, digit, and patient requirements. Each patient received verbal instructions from the hand therapist regarding the mallet finger injury, immobilization period, care of the orthotic, and methods for self-care and cleaning while maintaining the DIP joint in full extension. In addition to the verbal instructions, all patients were provided with a written education pamphlet and an online video link specific for the type of orthotic (stack splint A: https://www.youtube.com/watch?v=8b_9Fz2edw0; trough splint B: <https://www.youtube.com/watch?v=e7aHOTHx-8o>). At the follow-up appointment approximately 2 weeks after the initial appointment, a questionnaire regarding the educational materials was administered. The 9-item questionnaire included questions regarding use of the video and written instructions and the degree of helpfulness (scale from 0 to 10), preferences, and suggestions. Demographic, clinical, and treatment data were obtained from the medical charts.

Statistical analyses were performed to compare the utilization of the educational materials and related factors. The primary outcome was the helpfulness score for the written and video instructions, and paired *t* tests were used to compare these helpfulness scores.

Secondary analyses were performed to assess the impact of patient factors (age, sex, and second language) and use of written vs video instructions. Categorical data were compared with chi-squared analyses. Continuous data with a normal distribution were compared with paired or unpaired *t* tests, or with a non-normal distribution, a Wilcoxon signed rank test was used. The level of significance was set at $P < .05$.

Based on the primary outcome, a sample size of 54 patients would provide 95% power (effect size, 0.5; alpha, 0.05; and 2-tailed *t* test) to detect a difference in the helpfulness score between written vs video instructions.

Results

This study included 61 patients (41 men and 20 women) with a mean age of 42 ± 14 years, and 82% were right-hand dominant (Table 1). The commonly injured digits included the middle (35%) and ring (37%) fingers (Table 1). All patients reported that they could read, speak, and write in English and 27 spoke another language. All patients had a computer or laptop, and 90% had a smartphone. The orthotic most frequently used was the stack type ($n = 50$) and followed by the trough type ($n = 11$).

The written instructions were used by more patients ($n = 57$) compared with the online videos ($n = 30$). Comparing patients who viewed the video with those who did not, there were no differences ($P > .05$) in demographics (sex, age, education level, work status, and second language). Patients reported that both written and video instructions were helpful (Fig. 2). The mean helpful scores were high for the video and written instructions, and the video (9.4 ± 1.9) was significantly ($P = .03$) higher than written (8.8 ± 1.3) instructions. Patients (49%) reported a preference to having both written and video instructions and that both were easy to understand and convenient.

Discussion

Nonoperative treatment of mallet finger injury requires strict adherence to a long duration of immobilization to maintain the DIP joint in extension. Deviation from this protocol may result in a poor outcome and a DIP joint extensor lag. Patient education and understanding is an important component of nonoperative management of mallet finger injuries. With the increased accessibility of electronic media, the provision of patient education via this media is feasible and has become an important adjunct to the traditional written educational instructions in a hand therapy setting.

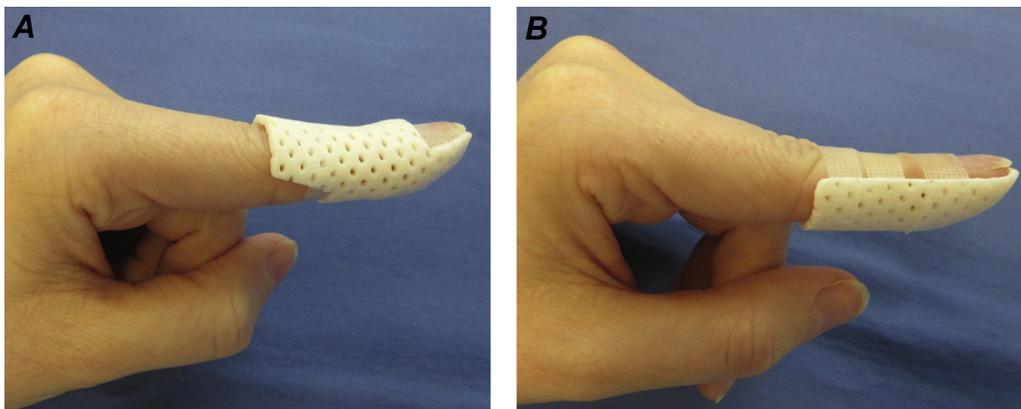


Fig. 1. After assessment by the hand therapist, patients were provided with either a custom-made orthotic: (A) stack or (B) trough.

Table 1
Patient demographics

Variable	N (%)
Sex	
Women	20 (33)
Men	41 (67)
Hand dominance	
Right	52 (85.2)
Left	9 (14.8)
Hand injured	
Right	27 (45)
Left	33 (55)
Digit injured	
Index	4 (6.7)
Middle	21 (35)
Ring	22 (36.7)
Small	13 (21.7)
Marital status	
Single, never married	29 (47.5)
Separated, divorced	3 (4.9)
Widowed	1 (1.6)
Married/remarried	17 (27.9)
Living with partner	10 (16.4)
Education (highest level completed)	
Elementary school	0
Some high school	0
High school	5 (8.2)
Some college/university	5 (8.2)
College/university degree	30 (49.2)
Graduate degree	21 (34.4)
Work status	
Full time	42 (68.9)
Part time	6 (9.8)
Homemaker	0
Other	4 (6.6)
Unemployed	6 (9.8)
Disability/government assistance	1 (1.6)
Retired	2 (3.3)
English language	
Speak	61 (100)
Read	61 (100)
Write	61 (100)
Other language	
Speak	27 (44)
Read	21 (34)
Write	19 (31)
Access to video	
Computer/laptop	61 (100)
Smartphone	55 (90)
Phone data plan	54 (88)

In our study, most patients preferred having access to both the written and video instructions. Previous studies have highlighted the immediate- and long-term benefits of both video and written medical information.^{13–17} In an earlier study in patients with neck and low back pain, therapist supervision was superior to receiving only written instructions.¹⁸ This study highlights the importance of supplementary patient education that is needed and the limitations of providing only written instructions.¹⁸ In a study evaluating video vs therapist instruction after rotator cuff repair, the authors report no overall differences in outcome but found videos to be an important component of patient education.¹⁹ In our study, although both written and video instructions were reported as being helpful, more patients found the video easy to understand and more patients found the written instructions convenient. In some cases, electronic media may be the preferred media for delivery of patient educational material. In our study, most patients viewed the video on a computer, but in the future, patients may find this source of information more convenient to view on their phone. Many sources of educational materials related to hand pathologies and hand therapy are available online through electronic access. A previous study found less access to online sources in patients who reported

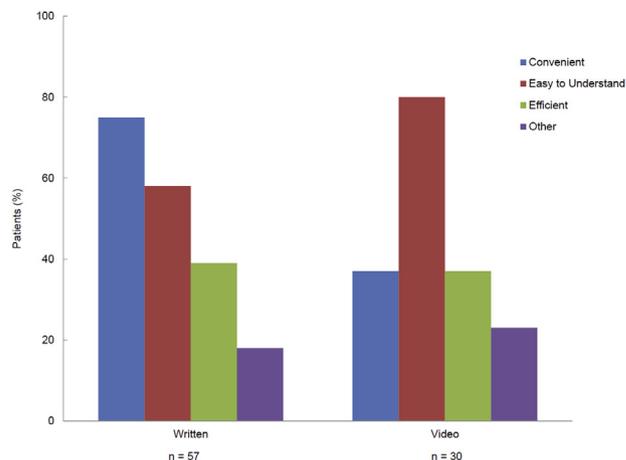


Fig. 2. Comparison of reasons that video or written instructions were preferred.

lower income.⁸ In our study, most patients were working and had a phone data plan, and access to online resources was not relevant in our patient sample. However, it is important to consider the potential burden and restriction of retrieving online and electronic educational materials related to access and cost of these resources available on the Internet. Studies have also reported the need for the appropriate readability level related to the target patients in other medical diseases and pathologies.^{13,20,21} To provide extensive access to different patient populations, the National Institutes of Health has recommended grade 7–8 level for patient educational materials.²² Studies investigating the readability levels for hand surgery educational materials on plastic and orthopedic surgery Web sites and carpal tunnel syndrome have shown that these materials exceed the National Institutes of Health recommendations.^{5,6} Our patient educational materials and instructions for mallet finger injury were written at grade 5 level. A review of the online patient educational materials related to hand pathology found a mean grade reading level of 9.49 with a high reading ease score.²³ This review highlights the comprehension difficulty and lack of understanding that many patients may face who are trying to access educational materials.

The strengths of this study include prospective study, acute mallet finger injuries, and adequate follow-up. The limitations of this study are that the sample included a select group of English-speaking patients who were referred to hand therapy for treatment. As such, these results may not be generalized to all patient samples and all diagnoses. Variability in the educational needs may be dependent on specific patient and injury factors that were not assessed in this study and should be considered when developing educational materials for a wide range of patients and diagnoses.

Conclusions

In our study of patients with acute mallet finger injuries, written and video instructions were used, and both were reported as helpful. This study provides evidence of the usefulness of online videos as an educational aid and the opportunity for future investigations to improve patient access to educational materials.

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Quiz: # 636

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- # 1. Mallet management included
 - a. orthotic immobilization
 - b. patient education
 - c. an online video link
 - d. all of the above
- # 2. The study design was
 - a. RCTs
 - b. a case series
 - c. prospective cohort
 - d. retrospective cohort
- # 3. The use of the educational materials was evaluated via
 - a. a questionnaire
 - b. patient interviews
 - c. chart reviews
 - d. therapist examination
- # 4. The video link was shown to be
 - a. an equivalent tool to written instructions
 - b. a more effective tool than written instructions
 - c. an ineffective tool
 - d. too technically challenging to gain patient compliance
- # 5. The evidence supports the use of an online video link in addition to traditional interventions in the management of acute mallet finger injuries
 - a. false
 - b. true

When submitting to the HTCC for re-certification, please batch your JHT RFC certificates in groups of 3 or more to get full credit.