



ELSEVIER

Contents lists available at SciVerse ScienceDirect

Journal of Hand Therapy

journal homepage: www.jhandtherapy.org

JHT READ FOR CREDIT ARTICLE #252.

Scientific/Clinical Article

The impact of flexor tendon rehabilitation restrictions on individuals' independence with daily activities: Implications for hand therapists

Vicki Kaskutas OTD, MHS, OT/L^{a,*}, Rhonda Powell OTD, OTR/L, CHT^b^a Washington University School of Medicine, St. Louis, MO, USA^b Milliken Hand Rehabilitation Center, The Rehabilitation Institute of St. Louis, MO, USA

ARTICLE INFO

Article history:

Received 11 March 2012

Received in revised form

21 August 2012

Accepted 23 August 2012

Available online 11 October 2012

Keywords:

Flexor tendon

Tendon

Activities of daily living

ADL

One-handedness

Compliance

ABSTRACT

Study design: Descriptive, grounded theory.*Purpose:* This study identified activity limitations which individuals with flexor tendon lacerations experience post-repair and explored methods they used to support participation in life roles. The role of hand therapy during the period of restricted hand use is discussed.*Methods:* Standardized interviews with 19 individuals 6–12 months after flexor tendon repair (FTR) were recorded and thematic analysis was performed. Descriptive and nonparametric statistics were used to analyze quantitative data generated through these interviews.*Results:* Patients struggled to fulfill life roles during the period of restricted hand use following FTR. Most participants asked other individuals for assistance; however, 59% of the participants removed their injured fingers from the orthosis in order to use their hand to perform activities. All of the participants' hand therapists instructed them in orthotic wear and activity restrictions and most addressed pain management, but few addressed how to perform meaningful activities and participate in life roles during the period of restricted hand use. Participants who did receive these types of interventions perceived that they were very useful.*Conclusions:* During the phase of restricted hand use following FTR, it is important for hand therapists to address activity performance and participation in meaningful life roles, in addition to ensuring the integrity and function of the healing tendon. This can include instruction in one-handed methods, use of adaptive equipment, and exploration of accommodations needed at work.*Level of Evidence:* III.

© 2013 Hanley & Belfus, an imprint of Elsevier Inc. All rights reserved.

Introduction

Rehabilitation following digital flexor tendon repair (FTR) in the U.S. typically involves a 6-week course of orthotic use to protect the healing tendon. The conventional orthosis is forearm based and extends to the fingertips; in most cases it is to be worn 24 h per day. The individual is restricted from using the involved hand during that time, which can lead to inability to perform daily activities independently.¹ Despite advances in surgical techniques which allow earlier active range of motion, functional use of the involved hand remains restricted. Individuals who perform bimanual or resistive work tasks are limited to one-handed duty for several weeks. Patients report difficulty washing their hands, dressing, and

bathing² during this phase. Fitzpatrick³ found that all of the five patients interviewed in his research reported being extremely disadvantaged at work and home during the one-handed phase, which sometimes led to feelings of helplessness and guilt. Sanford and colleagues² found that 67% of the individuals in their study removed their orthosis during the four-week period of orthosis wear, with 25% of them leaving their orthosis off for more than an hour. The challenge in the U.S. may be even greater, where six weeks of splint wear is the norm. Two of the three patients in Sanford's study who experienced tendon re-rupture reported removing their orthosis for purposes other than prescribed exercise. Tendon ruptures in the early phases of treatment were linked to use of the injured hand in functional activities by Peck and colleagues.⁴

Non-compliance with protective precautions following flexor tendon repair has been associated with poor function⁵ and tendon rupture.⁶ It is important for the individual to understand post-surgical restrictions, orthosis wear and rationale, and the reasons

Recipient: Evelyn Mackin Research Grant 2009.

Poster Presentation: ASHT 34th Annual Meeting in Nashville, TN.

* Corresponding author. Tel.: +1 314 286 1672; fax: +1 314 286 1601.

E-mail address: kaskutasv@wusm.wustl.edu (V. Kaskutas).

for precautions (i.e. preventing stress on the healing tendon that could lead to rupture). Individuals with flexor tendon injuries experience limitation in activities and participation as defined by the International Classification of Functioning, Health, and Disabilities (ICF). A survey by Groth⁷ found that a majority of therapists treating flexor tendon repairs strictly followed physicians' orders and documented treatment protocols, which focus mainly on the body structures. Several recent reviews of FTR outcome studies found that the primary focus remains on body functions and physical impairment.^{8–11} Hand therapists diligently educate patients about the motions, positions, and tasks that they must avoid in order to preserve the integrity of the surgical repair; however, it is less clear that therapists provide education which can enable individuals to maximize function and allow participation in life roles during the first several weeks of rehabilitation. Since patients need to perform essential activities and meaningful roles during the healing phase of FTR, the standard treatment protocol may need to expand to teach patients how to safely perform required life tasks and participate in meaningful roles.

This research focused on the six-week post-operative period of orthotic wear and restricted hand use. The purposes of this study were to: 1) identify restrictions with which patients were and were not able to comply, 2) identify activities that were challenging for patients to perform, 3) identify strategies that individuals employed to fulfill essential and meaningful roles in their lives, 4) identify services provided by hand therapy to enhance participation in essential and meaningful life roles, and 5) explore participants' perceptions of usefulness of hand therapy services post-FTR. We hypothesized that during the first four to six weeks post-FTR most individuals have problems performing self-care tasks/household activities and work/leisure roles, at least 50% break immobilization precautions in order to participate in life activities and roles, and that hand therapy remains focused on promoting healing of the body structures and maintaining the functions of these structure and not on being able to perform daily activities and fulfilling life roles.

Methods

Procedures

Hand therapy records of patients treated at the Milliken Hand Rehabilitation Center after flexor tendon repair were reviewed to identify potential participants who met the study criteria. These individuals were sent a letter introducing the study. Potential participants were telephoned and read a standardized recruitment script. Individuals who provided verbal consent participated in a standardized telephone interview (Appendix A). Three occupational therapy graduate students performed two mock interviews to learn to deliver the script in a consistent manner and practice answering questions and directing conversation. Next, the principal investigator role-played a research participant and each research assistant interviewed her. The interview was recorded and analyzed for consistency with interview script and ability to redirect conversation and answer participants' questions. Research assistants were provided with individual feedback and coaching to ensure quality and consistency. The recorded interviews were transcribed verbatim and responses were categorized into the thematic categories that emerged. Participants did not receive compensation. Approval was received from the Institutional Review Boards at Washington University and The Rehabilitation Institute of St. Louis. This study was funded by the Evelyn Mackin research grant through the American Society of Hand Therapists.

Participants

Inclusion criteria for this study included flexor tendon repair 6–12 months previously, 5–6 weeks of orthosis use, participation in at least 6 therapy sessions, 18 years of age or older, fluent in English, and adequate cognitive functioning to independently follow post-operative restrictions. Participants were excluded if they did not meet the above criteria or had concomitant hand injuries. Midway through recruitment, the criteria were expanded to include individuals with digital nerve injury as many clients had concomitant digital nerve injury. Kumar and associates¹² found that 22% of the digital nerve injured patients in their study also had flexor tendon injuries, and recent systematic review of management of Zone II flexor tendon injuries included studies with digital nerve injuries¹³ as both structures are commonly lacerated.

Data collection

A standardized 20-min telephone interview (Appendix A) included 39 questions. Participants rated difficulty complying with restrictions on a 0–10 scale with 0 “no difficulty” and 10 “unable to comply”; they also estimated the amount of time that they complied with restrictions on a 0–100% scale. Participants identified tasks they were able and unable to perform while wearing the orthosis and following motion restrictions, and tasks that required breaking of precautions to some degree. Modified methods and strategies were identified. Participants noted if they received treatment in hand therapy to address personal factors (emotional adjustment and pain), activity performance (leisure, household, care of others, rest/sleep), and environmental interventions (technology, equipment, help from others). Perceived usefulness of these types of interventions was rated on a 0–10 scale, with 0 representing “not helpful at all” and 10 being “extremely helpful.” Participants were also asked to share feelings they experienced during the period of restricted hand use and to discuss adequacy of social support received.

Data analysis

In order to organize the wide range of areas identified by the participants, we used thematic analysis. The interviews were audio taped and transcribed verbatim. Three researchers independently assigned themes to the participants' responses using a grounded theory approach.¹⁴ These raters met and jointly developed a standardized coding method using classifications from the Occupational Therapy Practice Framework.¹⁵ Quantitative ratings were entered into an Excel database and statistical analysis was performed using the Statistical Package for the Social Sciences 18.0.

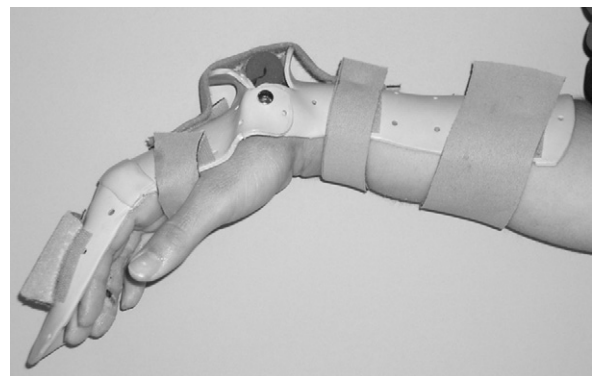


Fig. 1. Synergistic orthosis (Milliken Hand Rehabilitation Center).

Table 1
Observance of precautions ($n = 19$)

	Hand injured	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Mean % (s.d.)	Either hand	93 (18)	92 (18)	88 (16)	82 (26)	79 (28)	79 (28)
Mean % (s.d.)	Non-dominant	97 (5)	96 (7)	90 (12)	89 (12)	87 (16)	84 (18)
	Dominant	90 (24)	89 (23)	86 (19)	78 (32)	73 (34)	77 (35)

Mean compliance and usefulness ratings were computed and Mann–Whitney U were used to compare variables.

Results

Patient logs and chart reviews identified 23 patients meeting all study criteria. We were unable to reach two individuals and two refused. Nineteen individuals participated in this research, with a participation rate of 82.6%. Ten of the participants lacerated tendon(s) in their dominant hand (18 fingers and one thumb); 7 also lacerated a digital nerve. The sample included 9 males and 10 females. Ages ranged from 19 to 61 years of age (mean age of 35 years). The dominant hand was injured in 50% of the participants.

Use of orthosis and observance of precautions

The orthosis most commonly prescribed in this sample was a synergistic orthosis with hinged wrist (Fig. 1). The average reported period of orthotic wear was 7.2 weeks, with 44% immobilized 6 weeks, 19% less than 6 weeks, and 38% over 6 weeks. All participants noted they understood their orthosis wearing instructions, motion and positioning restrictions, and activities they were not allowed to perform with the involved hand. Fifty-nine percent of the participants reported not abiding by their precautions at least once during the period of restricted hand use; 41% claimed strict adherence. The most common restriction broken was removing the orthosis ($n = 6$), removing straps ($n = 3$), modifying the orthosis ($n = 1$), and flexing the fingers ($n = 1$). Variations included loosening the finger straps to allow the fingers to bend enough to do the task and removing 1–2 fingers from the orthosis straps. Table 1 lists the percent of time participants wore their orthosis and followed motion precautions. Mean ratings were lower in individuals with lacerations in their dominant hand; however, this difference was not statistically significant in this small sample.

Problematic activities and occupations

The activities which participants identified that they were unable to perform fell into the following categories of the Occupational Therapy Practice Framework¹⁵: self-care ($n = 10$), care of others ($n = 4$), household management ($n = 8$), work ($n = 2$), leisure ($n = 3$), communication ($n = 2$), and driving ($n = 3$). Some of the problematic self-care tasks were cutting meat, showering, toileting, brushing hair, applying makeup, fastening pants, buttoning, tying shoes, fastening bra, pulling up pants, putting on a coat and donning pantyhose. Household tasks which were difficult included cooking, opening jars, caring for pets, house cleaning, bed making, carrying groceries, opening doors, laundry, and mowing the yard. Community tasks that were problematic included opening doors, using public transportation, and manipulating money. Child rearing activities challenged several participants, such as dressing, bathing, diapering, and lifting the child. Communication-related tasks identified as difficult were writing and using a computer. Leisure tasks, such as playing videogames, guitar, and basketball, were also problematic.

Reasons for removal of orthosis

When asked why they removed their splints, patients reported that they had things in their lives that they had to do. Several comments offered by participants included, “I couldn’t take care of my baby with the splint on,” “You can’t cook with one hand when you have to lift pots,” and “I needed to go back to work and my job involves a lot of keyboarding.”

Strategies utilized to perform tasks and occupations

Many participants were able to devise new methods of completing tasks while abiding by their precautions. One individual commented, “I had never used my left hand before.” Many individuals adapted their methods, such as letting the dog out in the back yard instead of walking it, wearing clothing that was easy to don and doff, and using voice activation software to type. One individual noted that he had to change jobs. All participants asked others (family, friends, co-workers, or strangers) for help; 58% found that it was easy to ask for help, while others stated it was difficult, even emotionally laden. Comments included, “It was hard because I would need help for the simplest things,” and “I had to ask a bouncer to zip up my pants at a club; that was awkward to ask for.” Participants stated that most of the people they asked for assistance were happy to help. One individual stated that tasks did not get done during recovery.

Hand therapy services

Nearly all participants reported receiving instruction from their hand therapist about orthosis wear and the requirement of not using the injured hand. Six of the 19 participants (32%) stated that their therapist addressed how to perform activities while wearing the orthosis or described how to avoid using the involved hand. One participant stated, “She really didn’t give me any instructions on how to do things. It was more like what not to do, make sure you don’t do this.” When participants were asked what could have been performed in therapy to help them perform these tasks, one person noted that therapy could have addressed dressing and another

Table 2
Activity addressed in therapy (mean) & mean usefulness ratings (0–10 scale) ($n = 19$)

	Addressed in therapy (%)	Overall mean usefulness rating	Addressed in therapy usefulness	Not addressed in therapy usefulness
Self-care	47	5.37	6.22	4.60
Driving*	32	4.26	7.50	2.77
Household tasks	26	5.16	8.00	4.14
Care for others*	26	4.11	7.00	3.00
Work/school	42	5.33	7.38	3.70
Leisure*	26	5.47	8.80	4.29
Sleep/rest**	74	6.68	8.50	1.60
Pain	90	6.72	7.38	1.50
Emotion	32	5.47	7.67	4.46
Overall	44	5.40	7.61	3.34

* p -Value on Mann–Whitney $U \leq 0.05$.

** p -Value on Mann–Whitney $U \leq 0.005$.

Table 3Reported responses to protocol/therapy experience ($n = 19$)

	Felt socially advantaged/disadvantaged (%)	Received adequate support (%)	Surprised at reactions of others (%)	Therapist arranged resources (%)	Resources wish available (%)	Life changing experience (%)
Yes	56	95	22	95	5	89
No	44	5	78	5	95	11

stated performing household tasks. A common response was that they “needed to figure it out themselves” or “it was common sense.” One participant noted her therapist addressed diapering her baby. “She actually brought a diaper and we practiced putting it on a doll, but that’s different than a real baby.” Pain and sleep/rest were addressed most frequently in therapy; followed by self-care, household tasks, and care of others. Less than one-third of participants noted that the therapist addressed emotional issues that they were experiencing during therapy (Table 2).

Perceived usefulness of therapeutic interventions

Participants’ ratings of perceived usefulness of interventions are described in Table 2. The usefulness ratings were higher in individuals who received an intervention in comparison to those who did not, with statistically significant differences ($p \leq 0.05$) in usefulness scores for sleep/rest, driving, leisure, and care of others. Interventions to address leisure performance received the highest rating in people who received the intervention, and emotional issues received the highest rating in participants who did not receive the intervention in therapy. Individuals who injured their dominant hand had higher ratings for most areas; however, these differences were not statistically significant in our small sample.

Emotional responses

Participants noted fear ($n = 5$), depression ($n = 4$), uselessness ($n = 2$), frustration ($n = 2$), and anger ($n = 1$) after their injury. One participant stated, “When you can’t use your hand all of a sudden, you get frustrated.” Most of the participants spoke to friends and/or family about difficulties they were having dealing with their injury ($n = 13$); however, some did speak with a co-worker, physician, psychiatrist, and/or therapist about the problems they were having. Two individuals experiencing an emotional response did not share their problems with anyone. Most participants stated that they received adequate support during rehabilitation (Table 3) and that family, friends and co-workers were supportive and/or helpful. Most participants agreed that the experience was life changing and

many believed that they were socially disadvantaged during the recovery period. One participant stated, “It was one of the hardest times in my life. It was kind of traumatic to go through all of this.”

Discussion

This research provides a unique perspective of the match between the problems patients encounter during the first 6 weeks after FTR and the interventions that they receive in hand therapy. Strengths of this study include the combination of qualitative and quantitative methodologies, which was necessary to understand the “lived experience.” The rate of participation of patients with FTR at the hand center was high, which ensures that the results are internally valid. However, all patients were from one hand center so they may not be generalized to the population of patients with FTR. Inclusion of individuals with concomitant digital nerve injuries may present a confounding factor; however, the prevalence of flexor tendon with digital nerve lacerations is common. Since participants were 6–12 months post-FTR, recall bias may have occurred. However, discussion about the first weeks of therapy during the final weeks of therapy might also have been problematic if that approach had been taken.

All of the research hypotheses were supported; unfortunately, the findings are not as we had hoped. Most participants struggled to perform daily activities and meaningful occupations during the period of restricted motion and orthosis use post-FTR. Many individuals had difficulty performing self-care activities and household management tasks. It is especially discerning that some individuals were unable to fasten their clothing after toileting, a very intimate task which is performed many times each day. Despite understanding their precautions, 59% of the individuals in this sample flexed the fingers of their injured hand against some resistance to perform activities that they viewed as essential. This is in line with previous research² findings which found that 67% of patients used their injured hand. Fortunately, none of the participants in our study experienced re-rupture. Adherence to motion restrictions was high the first two weeks after FTR; however, this decreased over time. It is doubtful that our sample exemplified rule-breaking

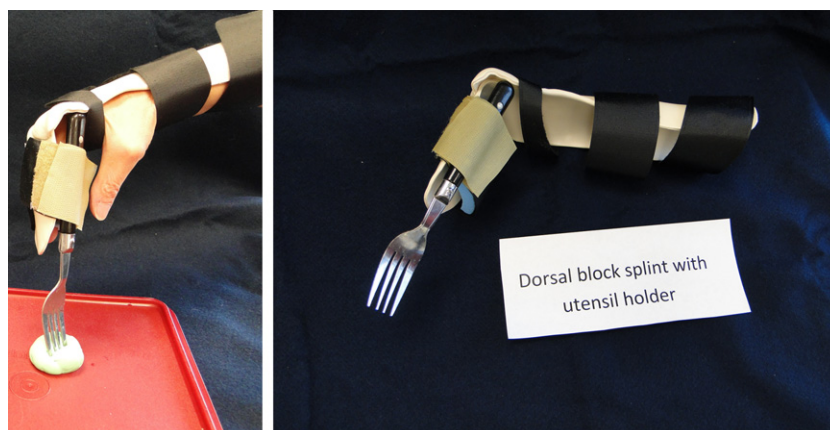


Fig. 2. Utensil attachment to dorsal block orthosis.

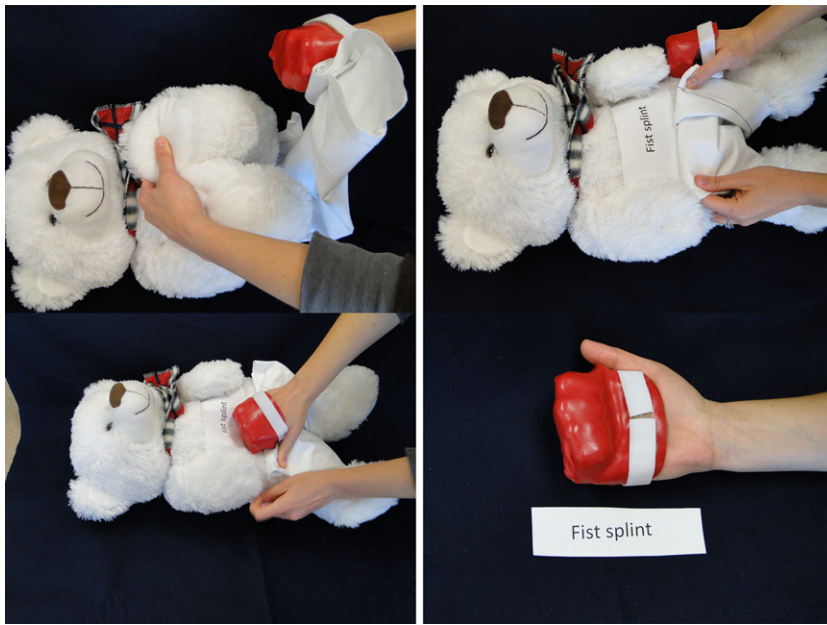


Fig. 3. Fist orthosis for diapering.

people who were careless about their health. It is likely that they were concerned about the long-term function of their injured finger(s), but they were also driven to be independent, productive and to meet responsibilities. When the individual removed the strap or the entire orthosis to sign his or her name or diaper the baby, he or she most likely tried not to use the injured finger and did not view this as putting their tendon repair at risk or felt the pressure to perform the task outweighed the risk. This is an area for future research.

As hypothesized, hand therapy services during the period of restricted hand use focused on the body structures and functions, but not on the activity performance and participation. Participants reported that their therapists educated them not to use the involved hand, to wear the orthosis at all times, and to avoid specific bimanual activities. Most individuals problem-solved methods to perform daily activities independently, without the trained eye of a clinician to estimate the risk incurred when they lifted the pot to the stove or tied their shoe. Most participants were not given adapted equipment or hand-outs demonstrating one-handed techniques, and they were not required to demonstrate proficiency with one-handed activity performance. However, this is in line with recent literature on FTR,^{8–11} the ASHT's Flexor Tendon Practice Guidelines,⁸ and textbooks commonly used by practicing

hand therapists. Rehabilitation of the Hand and Upper Extremity¹⁶ devotes the entire 24-page chapter on FTR to maintaining structural integrity of the repaired tendon and restoring motion and strength once restrictions are lifted; however, use of one-handed methods and adaptive equipment during the phase of restricted hand use is not mentioned. The therapists who treated the participants in this study appeared to be practicing in the mainstream. Most of these clinicians are certified hand therapists who participate in monthly journal clubs to discuss current literature, regularly attend continuing education courses, and are involved in teaching and research. They work closely with hand surgeons and collaborate on patient care, measure outcomes using the Quick DASH, and regularly ask their patients about problems they are having.

It is within the scope of hand therapy practice to address the activities and role demands that patients encounter following flexor tendon repair. Hand therapists "enhance an individual's ability to execute tasks and to participate fully in life situations,"¹⁷ including training in activities of daily living, assistive devices, and compensatory techniques.¹⁸ Michener and colleagues¹⁹ recommended that hand therapists assess patients' functional capacities while wearing the required orthosis to understand how compliance to their restrictions relates to their occupational performance, including simulation of activities in the clinic that patients do on



Fig. 4. Keyboard assist.

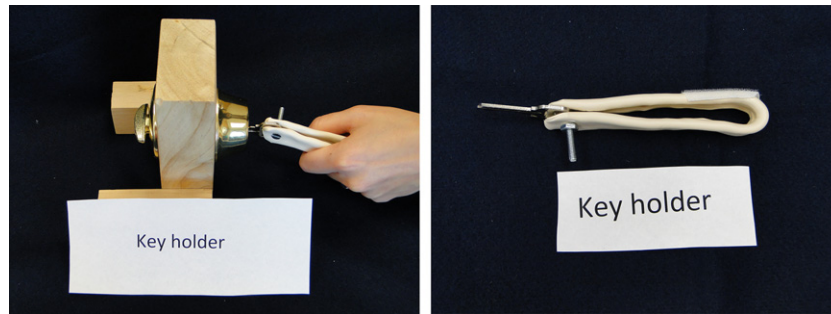


Fig. 5. Key holder to use with non-dominant hand.

a daily basis. Our research supports Michener's findings. Areas for future research include measuring the effect of splint modifications or adaptive equipment added to the protective orthosis (Figs. 2 and 4), use of a fist orthosis (Fig. 3) that allows the patient to use the "fisted" hand and extremity to perform tasks, and use of commercially available devices (Fig. 5). Another potential area of research is exploring the comfort of hand therapists addressing emotional issues with their patients. Many hand therapists are occupational therapists, so they have been trained to address psychosocial and cognitive functioning.

Use of the Canadian Occupational Performance Measure,²⁰ which was found to be more sensitive to change than the DASH in people with hand injuries,²¹ may have identified the participants' performance problems better than tracking changes in overall scores on the Quick-DASH; however, it takes more time to administer, and time limitations with patients is often a concern in busy clinics. Finally, as therapists, we define the treatment experience for our patients. If we focus on the fit of an orthosis or the gliding of a tendon, our patients assume that the practice of hand therapy stops there. Participants' statements that figuring out how to perform activities while splinted was "common sense" and "something they needed to figure out" suggests this is true. Patients who receive client-centered care may be more apt to express emotional issues they may be experiencing, which were fairly common in our sample. This will allow the therapist to suggest resources or make referrals that may be warranted. Client-centered interventions may lead to better overall outcomes, as patients are better able to adhere to precautions while maintaining a more normal quality of life.

Conclusion

FTR precautions require patients to function with one-handed status for several weeks. 59% of the patients in this study reported that they were unable to do this and felt that they had no recourse except to break precautions in order to perform necessary tasks. Hand therapists can facilitate patients' ability to comply with FTR precautions, and thereby optimize outcomes, by incorporating one-handed ADL training and a more holistic approach to flexor tendon rehabilitation.

Acknowledgments

In addition to study participants, we would like to thank Sharon Allen, Alyssa Platt, and Andrea Sallee, Occupational Therapy graduate students at Washington University School of Medicine for their help in this research. We are also grateful to the Milliken Hand Rehabilitation Center therapists who assisted with this project: Stacy Baker OTR/L, Chris Burridge PT, CHT; Ellen King OTR/L, CHT, and Patti Lees OTR/L, CHT.

References

1. Bircan C, El O, Akalin E, et al. Functional outcome in patients with zone V flexor tendon injuries. *Arch Orthop Trauma Surg.* 2005;125:405–409.
2. Sanford F, Barlow N, Lewis J. A study to examine patient adherence to wearing 24-hour forearm thermoplastic splints after tendon repairs. *J Hand Ther.* 2008;21:44–53.
3. Fitzpatrick N. A phenomenological investigation of the experience of patients during a rehabilitation programme following a flexor tendon injury to their hand. *Br J Hand Ther.* 2007;12:76–81.
4. Peck F, Bücher C, Watson J, Roe A. A comparative study of two methods of controlled mobilization of flexor tendon repairs in zone 2. *J Hand Surg Br.* 1998;23:41–45.
5. Chan T, Ho C, Lee W. Functional outcome of the hand following flexor tendon repair at the 'no man's land'. *J Orthop Surg (Hong Kong).* 2006;14(2):178–183.
6. Dowd M, Figus A, Harris S, Southgate C, Foster A, Elliot D. The results of immediate re-repair of zone 1 and 2 primary flexor tendon repairs which rupture. *J Hand Surg Br.* 2006;31:507.
7. Groth GN. Current practice patterns of flexor tendon rehabilitation. *J Hand Ther.* 2005;18:169–174.
8. Morris B, O'Connor MM, Hohman L, Blackmore S. *Flexor Tendon Practice Guidelines.* American Society of Hand Therapists; 1997.
9. Tang JB. Clinical outcomes associated with flexor tendon repair. *Hand Clin.* 2005;21:199–210.
10. MacDermid JC. Measurement of health outcomes following tendon and nerve repair. *J Hand Ther.* 2005;18:297–312.
11. Oltman R, Neises G, Scheible D, Mehrtens G, Grüneberg C. ICF components of corresponding outcome measures in flexor tendon rehabilitation—a systematic review. *BMC Musculoskelet Disord.* 2008;9:139.
12. Kumar S, Hassouna H, Penematsa S. Clinical and user-friendly classification of traumatic digital nerve injuries of hand. *Arch Orthop Trauma Surg.* 2007;127:527–530.
13. Luborsky MR, Lysack C. Overview of qualitative research. In: Kielhofner G, ed. *Research in Occupational Therapy: Methods of Inquiry for Enhancing Practice.* Philadelphia: F.A. Davis Company; 2006.
14. Chesney A, Amitabh C, Abdullah K, Forough F, Phil M, Achilleas T. Systematic review of flexor tendon rehabilitation protocols in zone II of the hand. *Plast Reconstr Surg.* 2011;4:1583–1592.
15. Roley S, DeLany J. *Occupational Therapy Practice Framework: Domain and Process.* 2nd ed.; 2008.
16. Skirven T, Callahan A, Oserman AL, Schneider L, Hunter J, eds. *Hunter, Mackin & Callahan's Rehabilitation of the Hand and Upper Extremity.* 5th ed. Philadelphia, PA: Elsevier Health Sciences; 2002.
17. Dimick MP, Caro CM, Kasch MC, et al. 2008 Practice analysis study of hand therapy. *J Hand Ther.* 2009;22:361–376.
18. American Society of Hand Therapists. Position Paper on Hand Therapists' Scope of Practice. <http://www.asht.org/downloads/about/SOP-11-08-2011.pdf>. 2011.
19. Michener S, Olson A, Humphrey B, et al. Relationship among grip strength, functional outcomes, and work performance following hand trauma. *Work.* 2001;16(3):209–217.
20. Law M, Baptiste S, Carswell A, McColl M, Polatajko H, Pollock N. *Canadian Occupational Performance Measure.* 3rd ed. Ottawa, Ontario, Canada: CAOT; 1998.
21. Case-Smith J. Outcomes in hand rehabilitation using occupational therapy services. *Am J Occup Therapy.* 2003;57:499–506.

Appendix A

Interview questions

- What were your restrictions after your tendon was surgically repaired?
- How many weeks the restrictions were in place?

- Rate on a 0–10 scale how difficult it was for you to comply with these restrictions overall, with 0 no difficulty noted, and 10 extremely difficulty.
- Now we will estimate the amount of time you were able to comply with these restriction while they were in place, with 0 denoting I never complied, and 100% I always complied.
- I need to understand if this compliance changed over time. So please rate your compliance for week 1, week 2, week 3, week 4, week 5, week 6.
- What was the most difficult restriction for you to comply with? (Examples include removing the splint (orthosis) in therapy only, avoiding bending your fingers, etc.).
- Describe tasks that you were able to perform without difficulty while wearing your splint (orthosis) and following all restriction.
- Describe tasks that you were eventually able to perform without difficulty while wearing your splint and following all restriction, but that the first few times you tried you were unable to perform them.
- What type of modifications did you need to use in order to perform these tasks? Give examples if needed, such as learn how to do with 1 hand, use adaptive equipment, use technology, practice until I could do it, etc.
- Did you ever feel that in order to carry on with your normal life you could not adhere to the rehabilitation protocol? If so, please describe tasks that you were able to perform only if you modified your restriction in some way or another, such as bending your finger a little bit, unfastening the splint (orthosis) strap, etc.
- Which tasks were you unable to perform while wearing your splint (orthosis)?
- Did you have someone else do these tasks for you or did the tasks just not get done? Please explain.
- If you asked others for help, please tell me how difficult it was for you to ask them.
- Now we will further discuss tasks that you performed with some degree of modification in your restrictions. Obviously these were important tasks or you would not have done them. Please describe what made these tasks important.
- What type of modifications did you need to make in your splint (orthosis) wearing or restrictions in order to perform these tasks?
- Now we are going to ask you about how your hand therapist prepared you to deal with the activity modifications you faced while wearing your splint (orthosis) and under motion restriction.
- Please explain the instructions received from your hand therapists regarding splint (orthosis) wear. How did the therapist teach you these? Did you understand these instructions?
- Please explain the instructions received from your hand therapists regarding your motion restrictions or precautions. How did the therapist teach you these? Did you understand these instructions?
- Please explain the instructions or training received from your hand therapists regarding how to perform meaningful daily activities while abiding by your motion restrictions and wearing your splint (orthosis). How did the therapist teach you these? Did you understand these instructions?
- We are interested in knowing how the therapist could have assisted you better during your immobilization phase. What types of things could your therapist have done that would have helped you through this difficult time?
- Next I will read you some therapy ideas that we identified. I would like you to tell us if each idea would have been helpful.
- Would it have been helpful for the therapist to discuss how to perform required daily activities? If so, rate on a 0–10 scale how helpful it would have been, with 0 not helpful at all, and 10 extremely helpful.
- Would it have been helpful for the therapist to discuss dealing with emotional issues associated with your injury? If so, rate on a 0–10 scale how helpful it would have been, with 0 not helpful at all, and 10 extremely helpful.
- Would it have been helpful for the therapist to discuss securing equipment or technology to help you be independent? If so, rate on a 0–10 scale how helpful it would have been, with 0 not helpful at all, and 10 extremely helpful.
- Would it have been helpful for the therapist to discuss asking co-workers, family members or friends to help you do daily tasks? If so, rate on a 0–10 scale how helpful it would have been, with 0 not helpful at all, and 10 extremely helpful.
- Would it have been helpful for the therapist to discuss how to perform meaningful activities with your family, friends and community? If so, rate on a 0–10 scale how helpful it would have been, with 0 not helpful at all, and 10 extremely helpful.
- Would it have been helpful for the therapist to discuss how to perform meaningful leisure activities? If so, rate on a 0–10 scale how helpful it would have been, with 0 not helpful at all, and 10 extremely helpful.
- Would it have been helpful for the therapist to discuss how to seek accommodations at work or school? If so, rate on a 0–10 scale how helpful it would have been, with 0 not helpful at all, and 10 extremely helpful.
- Would it have been helpful for the therapist to discuss how to perform household tasks such as cooking, cleaning and doing laundry? If so, rate on a 0–10 scale how helpful it would have been, with 0 not helpful at all, and 10 extremely helpful.
- Would it have been helpful for the therapist to discuss ways to care for others including your spouse, children, parents, and/or pets? If so, rate on a 0–10 scale how helpful it would have been, with 0 not helpful at all, and 10 extremely helpful.
- Would it have been helpful for the therapist to discuss issues you may have experienced with sleep and rest? If so, rate on a 0–10 scale how helpful it would have been, with 0 not helpful at all, and 10 extremely helpful. Who did you talk to in order to get support with the areas of life which you anticipated having difficulty with?
- What resources were available to you?
- What resources do you wish were available to you?
- Did you feel like you received adequate support?
- What kind of feelings did you experience initially, and did they interfere with your school, work or family life?
- How did your peers/co-workers/family members react to your situation?
- Were you surprised by their reactions?
- Do you feel like your life changed, or that you learned anything about yourself from this experience?
- What advice would you give to someone else who might go through a similar experience?
- Did you feel that you were at any advantage or disadvantage in social situations?

JHT Read for Credit Quiz: Article #252

Record your answers on the Return Answer Form found on the tear-out coupon at the back of this issue or to complete online and use a credit card, go to JHTReadforCredit.com. There is only one best answer for each question.

- #1. Approximately _____ % of surveyed subjects removed their protective devices at times to perform some ADL
- 10
 - 50
 - 60
 - 75
- #2. Data for the study was obtained through
- standardized interviews 6-12 months post op
 - customized interviews 1 month post op
 - questionnaires completed 6-12 months post op
 - randomized chart reviews 1 year post op
- #3. The most commonly used protective orthosis was
- a Kleinert rubber band traction device
 - a Duran early motion device
 - an Evans dorsal block orthosis
 - a hinged wrist synergistic orthosis
- #4. Approximately _____% of surveyed subjects reported that it “was easy to ask for help” in performing life functions
- 10
 - 50
 - 60
 - 75
- #5. Most therapists gave advice as to how to actually perform ADL while continuing to keep their injured digit in its protective device
- true
 - false

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