ISSN: 0975-833X

Available online at http://www.journalcra.com

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

International Journal of Current Research
Vol. 13, Issue, 11, pp.19744-19746, November, 2021

DOI: https://doi.org/10.24941/ijcr.42566.11.2021

RESEARCH ARTICLE

CONTRIBUTION OF KINESITHERAPY TREATMENT OF TRAUMATIC LESIONS OF THE FLEXORS OF THE HAND (COMPARATIVE STUDY OF EARLY PASSIVE VERSUS ACTIVE MOBILIZATION)

[1,*]Moukhass A. and [2]Haddoun, A.R.

[1]PhD student in Neuroscience at CEDOC- Faculty of Medicine and Pharmacy Casablanca Hassan II University
[2]Professor of Higher Education, Trauma Wing 4 at CHUIR

ARTICLE INFO

Article History:
Received 15th August, 2021
Received in revised form
29th September, 2021
Accepted 18th October, 2021
Published online 30th November, 2021

Keywords:

Physiotherapy Treatment,
Hand Flexor Lesions,
Passive Protocol,
Active Protocol.

Corresponding author:
Moukhass A.

ABSTRACT

Objective of the study : Compare the results of each of the early rehabilitation treatments (passive and active) with a view to orienting the therapeutic choice in the physiotherapy management of lesions of the flexors of the hand. **Materials and methods :** This is a single-blind, randomized clinical trial involving 30 patients suffering from operated hand flexor lesions divided into two series: Series 1 (n = 15): rehabilitation protocol for early passive mobilization and series 2 (n = 15): rehabilitation protocol for early active mobilization. The sample size was set according to Student's tests with an alpha threshold of 0.05, a power of 0.90. The intervention on the patients will be done at the level of the rehabilitation unit of the trauma service Wing 4 of the Ibn Rochd Hospital Center in Casablanca and will last 12 sessions at the rate of 03 sessions per week. The overall duration of the study depends on the flow of patients and will take approximately 6 months. The evaluation tool recommended for the classification of the results emanating from the study is that of the functional evaluation of the hand according to the method of White and boys.For statistical analysis, the data will be analyzed by SPSS software for Windows version 24.0. (Armonk, NY: IBM Corp). An ethics dossier relating to the study is in the process of being validated.

Expected results

The results found will make it possible to verify the following alternative hypothesis:

H1: There is a statistically significant improvement in favor of the rehabilitation protocol of early active mobilization versus early passive mobilization. This implies checking the resulting alternative sub-hypotheses:

H1.1: there is a statistically significant correlation of the distance pulp-palmar distal fold in favor of series 2 versus series 1.

H1.2: there is a statistically significant correlation of the total deficit of the distal extension in favor of series 2 versus series 1

Copyright © 2021. Moukhass and Haddoun. *This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.*

Citation: Moukhass A. and 2Haddoun, A.R. *"*Contribution of kinesitherapy treatment of traumatic lesions of the flexors of the hand (comparative study of early passive versus active mobilization)*", 2021. International Journal of Current Research, 13, (11), 19744-19746.*

INTRODUCTION

The repair of lesions of the flexors of the hand always poses the major problem which is the recovery of active mobility in flexion, in particular when they are located at the level of the digital columns. Physiotherapy rehabilitation has its place in post-operative care in order to restore all of the patient's functional capacities. A hand that does not recover results in a significant handicap for the patient in their daily activities as well as in their professional life and leisure time.

The socio-economic repercussions require that the management of flexor tendon injuries be of high quality. Reconstructive surgery of the flexor tendons has made great progress since the beginning of the last century. This evolution has taken place at the rate of numerous studies and clinical trials on tendon healing and surgical techniques. At the same time, different rehabilitation protocols have been developed. The objective of the rehabilitation of the flexor tendons of the fingers is to restore the gripping function of the hand. For this, the patient must recover optimal joint mobility.

Studies show that the choice of the rehabilitation protocol clearly influences the final range of motion. The recovery of range of motion requires correct tendon sliding, the absence of adhesions as well as the prevention of loss of extension. Immobilization has long been the only option considered to allow the tendon to heal safely. Since then, early mobilization has demonstrated its superiority because it stimulates the healing process and gives better functional results. However, it is not clear which of the protocols used gives the best functional results. Passive mobilization protocols are more protective with respect to the suture and active protocols tend to reduce the duration of treatment while improving functional parameters. In passive current, there are two main protocols, the Duran protocol and the Kleinert protocol. In the active current, there are two main protocols. The first, developed by Strickland, is known as "placed-held".

Objective of the study : Compare the results of each of the early rehabilitation treatments (passive and active) with a view to orienting the therapeutic choice in the physiotherapy management of lesions of the flexors of the hand.

MATERIALS AND METHODS

This is a single-blind, randomized clinical trial involving 30 patients suffering from operated hand flexor lesions divided into two series: Series 1 (n = 15): rehabilitation protocol for early passive mobilization and series 2 (n = 15): rehabilitation protocol for early active mobilization.

Inclusion criteria: age [18 -40] years, traumatic flexor lesions of the hand zone 1, 2 and 3.

Exclusion criteria: Traumatic flexor lesions of the hand zone 4 and 5, lesions of the thumb, associated nerve and bone lesions.

The sample size was set according to Student's tests with an alpha threshold of 0.05, a power of 0.90. The intervention on the patients will be done at the level of the rehabilitation unit of the trauma service Wing 4 of the Ibn Rochd Hospital Center in Casablanca and will last 12 sessions at the rate of 03 sessions per week. The overall duration of the study depends on the flow of patients and will take approximately 6 months. The evaluation tool recommended for the classification of the results emanating from the study is that of the functional evaluation of the hand according to the method of White and boys (table below).

	Pulp - distal palmar fold distance	Total extension deficit
Excellent	<1cm	<15 °
Good	1 to 1.5 cm	15 to 30 °
Average	2 to 3 cm	30 to 50 °
Bad	> to 3 cm	> at 50 °

For statistical analysis, the data will be analyzed by SPSS software for Windows version 24.0. (Armonk, NY: IBM Corp). The quantitative variables will be expressed as mean and standard deviation and the qualitative variables are given in proportion. The verification of the Normality hypothesis will be made by the test of Shapiro Wilk (1965) and Smirnov Kolmogorov (1948). For the comparison of the differences in scores between the two series, the Mann-Whitney (One-tailed) nonparametric comparison test for two independent samples will be conducted due to its robustness in the case of small samples (less than or equal to n = 30) as well as when the normality assumption is violated for Student's parametric test. For the ethics dossier relating to the study, it is in the process of being validated.

Expected results

The results found will make it possible to verify the following alternative hypothesis:

H1: There is a statistically significant improvement in favor of the rehabilitation protocol of early active mobilization versus early passive mobilization. This implies checking the resulting alternative sub-hypotheses:

H1.1: there is a statistically significant correlation of the distance pulp-palmar distal fold in favor of series 2 versus series 1.

H1.2: there is a statistically significant correlation of the total deficit of the distal extension in favor of series 2 versus series 1.

DISCUSSION

The first step is to discuss the methodological considerations of the study, among others: the relevance of the subject, the population under study as well as the biases… for the discussion of the results, it will target the comparison of the results compared to exciting literature. Recent studies report that lesions of the flexor tendons of the hand have an incidence of 30 to 42 per 100,000 population in developed countries. Work accidents concern 25% of these injuries. This proportion tends to decrease thanks to the improvement in machine safety. Men are three to six times more affected than women according to the studies. Many protocols exist, and have continued to arouse the curiosity of professionals and researchers in the field, giving rise to a rich literature relating to the rehabilitation of flexor tendons of the fingers (http://bibnum.univ-lyon1.fr care in masso-kinesitherapy of hand flowers). In view of the various studies, we cannot confirm the superiority of one technique over another as long as the inclusion criteria, the classification used, the operative procedure, the technicality and practice of the surgical and rehabilitation team. , are different. The surgeon decides which type of protocol to use depending on the patient's cooperation, his geographical distance, the nature and extent of the lesions, the surgical procedure performed and the technical nature of the rehabilitation team in charge of the patient (François Delaquaize, 2003).

The suture in zone 2 has been the subject of much research and technical descriptions. The differences relate to the size and material of the thread used, whether or not it is absorbable, the number of strands, the path of the thread, the type of epi-tendinous overlock and its depth, and the size. This development has, in part, allowed the establishment of more restrictive rehabilitation protocols. Controlling the tensions applied to the tendon improves tensile strength, decreases adhesions, improves tendon excursion, increases capillary proliferation, orients fibers, and improves the quality and biochemical composition of the tendon (Lucie MASAY, 2015). These protocols were developed mainly for the management of flexor tendons in Zone 2, and subsequently adapted for zones 1

to 5. Two early passive mobilization protocols serve as a basis for reflection for all mobilization protocols. In 1967, Kleinert introduced a passive mobilization protocol using a protective back splint with elastic traction (wrist at 30 ° flexion, 60 ° flexion of the MCP, the PIs are free). He then proposes a semi-active technique, active in extension with a passive return by elastic return. The active extension of the operated finger successively deploys IPP and IPD so that the two flexor tendons are mobilized and dissociated, therefore, the tendon is pulled distally during extension, and pushed proximally in flexion (Cao, 2006). The splint is gradually improved, but causes sequelae flessums despite the night plating of the fingers against the splint. These results are This can be explained either by incorrect placement of the pulley, significant elastic tension, poor monitoring or poor patient understanding (Elliot, 2002). In 1975, Duran proposed a passive mobilization protocol. It uses a protective back splint, positions the wrist at 30 ° flexion, MCP at 60 ° flexion, and IP at full extension without elastic traction. Originally, the wrist was placed at 20 ° flexion, and the fingers released in a protective flexed position using a strap attached to the nail. Twice a day the patient performs 8 repetitions of 2 exercises. Theoretically, each exercise pushes the flexor tendons proximally, and pulls them distally: passive flexion and extension of the IPD while maintaining the IPP and MP in flexion, slides the PDF relative to the sheath, and in relation to the SDS; passive flexion and extension of the IPP while keeping the MCP and IPD in flexion, slides the FDP and FDS relative to the surrounding tissues. This program is designed to promote 3 to 5 mm of tendon sliding and avoid restrictive adhesions (Duran).

Many authors agree that passive flexion of the fingers tends to push the suture area proximally, especially flexed wrist, which can cause tendon "kinking" against the proximal pulley rather than actual slippage. . Active mobilization does not completely eliminate this accordion effect, but pulls the tendon to allow more running (Peck, 2014). slides the FDP and FDS away from the surrounding tissue. This program is designed to promote 3 to 5 mm of tendon sliding and avoid restrictive adhesions (Duran). Many authors agree that passive flexion of the fingers tends to push the suture area proximally, especially flexed wrist, which can cause tendon "kinking" against the proximal pulley rather than actual slippage. . Active mobilization does not completely eliminate this accordion effect, but pulls the tendon to allow more running (Peck, 2014). slides the FDP and FDS away from the surrounding tissue. This program is designed to promote 3 to 5 mm of tendon sliding and avoid restrictive adhesions (Duran). Many authors agree that passive flexion of the fingers tends to push the suture area proximally, especially flexed wrist, which can cause tendon "kinking" against the proximal pulley rather than actual slippage. . Active mobilization does not completely eliminate this accordion effect, but pulls the tendon to allow more running (Peck, 2014). agree that passive finger flexion tends to push the suture area proximally, especially flexed wrist, which can cause tendon "kinking" against the proximal pulley rather than actual slippage. Active mobilization does not completely eliminate this accordion effect, but pulls the tendon to allow more running (Peck, 2014). agree that passive finger flexion tends to push the suture area proximally, especially flexed wrist, which can cause tendon "kinking" against the proximal pulley rather than actual slippage. Active mobilization does not completely eliminate this accordion effect, but pulls the tendon to allow more running (Peck, 2014). The 1980s gave way to active rehabilitation protocols combined with Kleinert and Duran protocols. These protocols aim to increase tendon travel in different ways: - by tenodesis effect, with active mobilization of the wrist. - in place held, by flexing the fingers and held active. - by active flexion of the fingers. In 1989, an early active mobilization program was proposed by Small (Cullen, 1989). The fingers are protected by a splint covering the fingers 2 cm beyond the fingernails to avoid any manipulation. The movements performed in the splint at 48 hours post-operative provide for total passive flexion, active flexion and active extension. These exercises are done every 4 hours, and the angle of flexion of the PPIs is gradually increased from 30 ° to 90 ° over 5 weeks (Korstanje *et al*., 2010). In 1995, Strickland and Cannon propose an active placed - held protocol. The fingers are passively placed in flexion, and the patient maintains flexion with minimal muscle contraction. The patient learns to use minimum force with the injured hand using biofeedback. This protocol is only intended for the rehabilitation of 4-strand sutured tendons, accompanied by an epi-tendon suture (Cannon, 1993). Sapienza in 2012, simulates active and passive movements on corpses, and underlines through this study, the interest of active mobilization. It allows a longer tendon stroke, because it is caused by a greater tension. It is therefore essential to strengthen the tendon sutures to increase the tension transmitted to the lesion (Sapienza *et al*., 2013). Thus, it is noted that the various biomechanical models proposed in the literature condition the postoperative rehabilitation of the flexor tendons. For this, it is still not possible to define an ideal rehabilitation process. It is in this perspective that this research is inscribed with the aim of refining the physiotherapy methods recommended in the postoperative recovery of lesions of the flexors of the hand at the level of the trauma service of the Ibn Rochd hospital center in Casablanca.

REFERENCES

François Delaquaize. 2003. Flexor tendons in zone II: Repair and rehabilitation Current methods and evolution of ideas. Joseph Fourier University Grenoble Faculty of Medicine

Lucie MASAY. 2015. Rehabilitation protocol with Manchester short splint in flexor tendon surgery in zone 2. Joseph Fourier University, Grenoble Faculty of Medicine

Cao Y, Tang JB. Resistance to motion of flexor tendons and digital edema: An in vivo study in a chicken model. J Hand Surg 2006; 31A: 1645-1651.

Elliot D. Primary flexor tendon repair-operative repair, pulley management and rehabilitation. J Hand Surg (Br). 2002; 27: 507-13.

Duran RE, Houser RG. Controlled passive motion following flexor tendon repair in zones 2 and 3. In: The American Academy of Orthopedic Surgeons: Sympos

Peck F. The rehabilitation of the flexor tendon injuries in zone 2. ifssh ezine 2014; 4: 32-37.

Cullen KW, Tolhurst P, Lang D, *et al*. 1989. Flexor tendon repair in zone 2 followed by controlled active mobilization. J Hand Surg (Br). 14: 392-5.

Korstanje *et al*. 2010. Ultrasonographic assessment of long finger tendon excursion in Zone V during passive and active tendon gliding exercises. *J Hand Surg.,* 35A: 559-565.

Cannon N. Post flexor tendon repair motion protocol. Indiana Hand center Newsletter. 1993; 1: 13-8.

Sapienza A, Youn HK, Karia R, Lee SK. Flexor tendon excursion and load during passive and active simulated motion: a cadaver study. J 40 Hand Surg Eur Vol. 2013 Nov; 38 (9): 64-71.

****