Journal of
Health Science and Development

ISSN: 2581-7310
J Health Sci Dev 2019

Case study of a Physiotherapeutic Alternative with Multimodal Combination to Optimize Sensory and Biomechanical Function in the Postoperative Period of a Reconstructive Microsurgery of the Hand

Sandra Prado PT
Alvaro Cho
Monica Nogueira

MD, PhD, Fabio Freire MD PHD

Introduction

Surgical reconstructions of complete hand injuries, especially in the peripheral nerves, can cause multiple complications: poor functional outcomes, sensitivity deficits, impaired sensory and motor integrity. These injuries cause paralysis and muscular atrophy, the most drastic situation in peripheral nerve injuries, in addition to alterations in the somatosensory map. The potential sensory and motor recovery in these injuries will be maximized by early intervention of an either surgical, when necessary, or physiotherapeutical approach.

Case description and methods

A 16-year-old male patient was referred to physical therapy after emergency surgical reconstruction of an extensive cut-contusion injury in the volar region of the left wrist caused by a glass door. The exploratory surgery enabled the diagnosis of the complete lesion of the ulnar artery, median and ulnar nerves and all flexor tendons of the wrist and fingers. The exploratory and reconstructive surgery were performed one day after the event and involved: microneurorrhaphy of the median and ulnar nerves and multiple tenorrhaphy of the wrist and finger flexors. In the postoperative period, the patient was kept in a plaster cast for 4 weeks, progressing with good healing of the surgical wound.

Physiotherapy was started 27 days after the accident with a program of 3 sessions per week for 6 months. The physiotherapeutic alternative chosen after a meticulous anamnesis was a combined multimodal therapy: Sohier concept manual therapy consisting of gentle maneuvers to harmonize the biomechanical rhythm of the joint while avoiding overstressing it, activating the circulatory system and favorably influencing the biological balances of the articular and periarticular tissues, leading to an increased range of motion, joint proprioception and the return of sensitivity. Myofascial therapies for the treatment of active fibrosis and the prevention of recurrence throughout treatment, consisting of sliding the conjunctive fascia and promoting venous drainage. Neuro-proprioceptive facilitation with the KABAT method was used for strength and proprioception. Infrared laser was used for tissue regeneration. Biostimulation in deep tissue healing (bone, cartilage and nervous tissue) was used for analgesic and anti-inflammatory action. Red laser was used for soft tissue stimulation ,healing and analgesia. Acupuncture and infrared laser were associated throughout the process. Carefully applied bandages were used to protect and limit venous congestion and associated edema, stimulating proprioception, improving range of motion and decreasing muscle spasms.

Article Information

Conferenc Proceedings: Global Congress on Physiotherapy, Physical Rehabilitation and Sports Medicine (Paris)

Conferecne date: 18-19 November, 2019

Inovineconferences.com

***Corresponding author:** Sandra Prado PT, Physiotherapist in Amiri Hospital Kuwait, PhD student in Reading University, UK; Email: sandrafisio.prado(at)hotmail.com

Citation: Prado PTS, Cho A, Nogueira M (2019) Case study of a Physiotherapeutic Alternative with Multimodal Combination to Optimize Sensory and Biomechanical Function in the Postoperative Period of a Reconstructive Microsurgery of the Hand. J Health Sci Dev.

Copyright: © 2019 Prado PTS. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Results

In 5 months of physiotherapy, the patient achieved excellent motor and sensory recovery of the hand, with complete recovery of the intrinsic muscles of the hand. After 6 months, he recovered total amplitude, strength, proprioception and grade 5 active functional mobility (see associated Video)

Discussion

The nerve regeneration process is slow (1mm/day in young adults). The consequences of hand injuries are devastating since muscle denervation leads to atrophy. Injuries to the median/ulnar nerve of the wrist may cause Siamese hand-type deformities in which the thenar eminence is flat with the unopposed thumb on the side of the second finger. Secondarily, the first interdigital space may contract due to thumb adduction, a characteristic deformity of ulnar nerve injury is the claw hand with hyper-extension at the metacarpophalangeal joints and flexion at the proximal and distal interphalangeal joints of the 4th and 5th fingers. This is a result of the loss of balance between intrinsic and extrinsic flexor and extensor muscles. There is also loss of the distal transverse arch of the hand, which becomes flattened.

Historically, many results reported after nerve repair injury have been considered poor, which has stimulated research on neurobiology, neuroimmunology, stem cell research, and neural conduits.

Conclusion: The combined multimodal approach involving Sohier concept manual physiotherapy, conjunctival fascia therapy, proprioceptive neuro-facilitation, red and infrared laser, acupuncture and elastic bandages may be an effective alternative for patients with nerve and wrist flexor tendon injuries. To our knowledge, this is the first record of this combination with excellent results in a situation where traditional approaches are not very effective.

References

1. Hurst. Hurst, L.C., Dowd, A., Sampson, S.P., and Badalamente, M.A.: Partial Lacerations of the Median and Ulnar Nerves. J. Hand Surg 1991 16A:207-10.
2. Artigo (PDF disponível) no Journal of Biomedicine and Biotechnology 2014 (2014): 132350 · julho de 2014 com 1.874 leituras
3. DOI: 10.1155 / 2014/132350