

## Use of a Static Ring Splint as a Therapeutic Resource in Hand Therapy

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### Abstract

Fractures of the phalanges are always difficult to resolve, they usually involve swelling, stiffness and functional impotence and it is essential to find new therapeutic options.

The thumb is the most relevant finger in the hand, and its biomechanical importance should make us pay special attention to the therapeutic measures that we propose [1].

One of the most damaging consequences of fractures is the possibility of adhesions of the tendinous apparatus to the fracture. To fight against this fact, we have the chance to offer the patient enough support so that the activation of the affected soft tissues can be carried out [1]. A winning formula to achieve this objective, is the confection of static splints with thermoplastic material [2]. These must meet biomechanical criteria, must be adapted to the mechanical needs of the injury, and must respect the active physiological processes to provide us with specific solutions.

**Keywords:** *Splint; Hand; Thumb; Physiotherapy; Biomechanics*

### Abbreviations

FPL: Flexor Pollicis Longus; P1: 1<sup>st</sup> Phalanx Bone; P2: 2<sup>nd</sup> Phalanx Bone; IP: Interphalangeal

### Introduction

The interphalangeal joint is a trochlear joint [3], and it only allows a degree of movement that is flexion and extension [4]. In the case at hand, we find a fracture of P1 of the thumb and a deficit of sliding of the FPL. For the IP articulation to work properly, we need the articulation to be congruent, and the surrounding soft tissues to be flexible, not to be retracted and have the ability to slide over one another [5].

### Materials and Methods

The material resource in this case report is Orficast, a thermoplastic tape made of thermoformable taping material, from Orfit Industries. This material can be molded by introducing it in water at 50°C or by subjecting it to a hot air gun.

### Case Report

56 years old male who was operated from a fracture of P1 of the thumb, stabilized with two retrograde screws, and a tenolysis of the FPL. He was referred to my practice to start physiotherapy treatment. In the early exploration, I detected that FPL activation was not enough to flex P2 over P1, and he could only perform a small movement.

Among other measures to take, I decided to evaluate the use of a static ring splint, which would hold P1 and its osteosynthesis and at the same time offer a point of support [6] so that the patient could do an active work of FPL 24 hours a day [7].

Patients with tenolysis are always invited to follow a specific training, which consists of a guide of exercises 15 minutes every hour. I noticed that this patient was in trouble when trying to activate FPL, so I thought of offering him a splint that would act as a pulley to help him providing a point of support to ease the action and sliding of the tendon (placing the finger in maximum abduction) [5].

To give shape to this splint I usually use Orficast, which allows me to perfectly adapt the material to the outlines of the finger and gives me the chance to mold it to my liking according to the needs of the patient [2].

In this case, the result is a customized splint that meets the biomechanical requirements to maintain stability, and in turn, favour mobility and function [2]. This is why the use of splints in hand therapy is essential, because they offer the hand therapist an important help to reach the goal.



(Figure)

### Discussion

The standard treatment in the fractures of phalanges of the fingers intervened surgically is the analytical and progressive mobilization, fight against the edema and favor the repair of the tissue [8], but often we must contribute some type of external help to favor these objectives.

Despite surgery and physical therapy, functional impotence can be frustrating for both the patient and the hand therapist, and can be challenging to treat.

This case just shows that splints can be quite effective in helping rehabilitation processes [9]. Although this type of therapy requires a high degree of training, it is relatively cheap and easy to carry out in the practice [10].

## Conclusion

Currently, rehabilitation protocols do not contain explicit reference to the use of splints in hand therapy, probably due to lack of experience. This case only wants to show the possibility of contributing to the process using a handmade, customized and really useful tool, and at the same time, escape from routines that can be easily improved [7].

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