



## Original article

# Polypropylene prosthesis for the treatment of fingertip injuries. Description of surgical technique and results<sup>☆</sup>



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## ABSTRACT

**Objective:** Report the results of treatment of fingertip injuries and describe this reproducible and low cost surgical technique, which utilizes a polypropylene prosthesis that temporarily replaces the nail and is placed on the area of injury, providing protection and encouragement for healing by secondary intention.

**Method:** This study evaluated 22 patients with traumatic injuries of the fingertips in the period from January 2012 to December 2015. All procedures were performed by the same surgeon. The mean postoperative follow-up was 13 months, with a minimum follow-up of six months. For all statistical inferences, a *p*-value of 0.05 was considered. The software used was SPSS version 21.0 for Windows.

**Results:** There were no cases of complications related to the polypropylene device. There was no significant difference between static two-point discrimination and age, between discrimination and time between injury and surgery, or between discrimination and time to follow-up. The authors used a table of scores that includes three factors proposed by Jefferson for a better evaluation of the results. 72.7% (16 cases) of patients had good results, 22.7% (five cases) fair results, and only 4.5% (one case) poor result.

**Conclusion:** This study presented a new technique for finger tip lesions, simple and easily reproducible, with satisfactory results and low complication rates.

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## Uso da prótese de polipropileno para o tratamento das lesões em ponta de dedo. Descrição de técnica cirúrgica e resultados

### R E S U M O

#### Palavras-chave:

Falanges dos dedos da mão  
Traumatismos dos dedos  
Adulto

**Objetivo:** Relatar os resultados do tratamento das lesões de ponta de dedo, bem como descrever a técnica cirúrgica, reproduzível e de baixo custo, que usa uma prótese de polipropileno que substitui temporariamente a unha e é colocada sobre a área da lesão, promove proteção e estímulo para a sua cicatrização por segunda intenção.

**Método:** Foram avaliados 22 pacientes portadores de lesões traumáticas da polpa digital de janeiro de 2012 a dezembro de 2015. Todos os procedimentos foram feitos pelo mesmo cirurgião. O tempo médio de seguimento pós-operatório foi de 13 meses, com um seguimento mínimo de seis meses. Para toda a inferência estatística, considerou-se um valor de  $p$  de 0,05. O software usado foi o SPSS for Windows, versão 21.0.

**Resultados:** Não foi observado caso de complicação referente ao dispositivo de polipropileno. Não foi observada diferença estatística significativa entre sensibilidade estática entre dois pontos (DE2P) e idade, entre sensibilidade e tempo entre lesão e data da cirurgia nem entre sensibilidade e tempo de seguimento. Adotou-se uma tabela de escores que incluiu três fatores propostos por Jefferson para melhor avaliação dos resultados; 72,7% (16 casos) dos pacientes tiveram resultados bons, 22,7% (cinco) regulares e apenas 4,5% (um) apresentou resultado ruim.

**Conclusão:** O presente estudo apresentou uma nova técnica, simples e facilmente reproduzível, para as lesões das pontas de dedos com resultados satisfatórios e baixa taxa de complicações.

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## Introduction

Injuries to the fingertips, defined as the distal portion of the finger where the flexor and extensor tendons are inserted, are responsible for one of the main causes of emergency room visits in public and private hospitals.<sup>1</sup>

These injuries, when untreated or poorly managed, often lead to irreparable sequelae and limitations, causing a great loss to the economically active population, especially when they involve the thumb and/or index finger.<sup>2</sup>

In the literature, numerous techniques have been described for the treatment of fingertip injuries, in order to maintain maximum length, with functional coverage and adequate sensitivity. Different factors should be considered when choosing one surgical technique over another, especially the type of injury and factors related to the patient, surgeon, and institution.<sup>2-5</sup> However, many techniques are not reproducible elsewhere, due to their cost and the population studied.

This article is aimed at reporting the results of the treatment of fingertip injuries, as well as to describe a reproducible, low-cost surgical technique that uses a polypropylene prosthesis that temporarily replaces the nail and is placed over the area of the injury, by protecting and stimulating its healing by second intention.

## Material and methods

Twenty-two patients with traumatic injuries of the digital pulp were studied from January 2012 to December 2015. All

procedures were performed by the same surgeon. The study was approved by the Ethics Committee of the institution and the patients signed the Informed Consent Form to participate.

Initially, a descriptive analysis of the studied variables was performed. Due to the non-normality of the data, non-parametric tests were used for inferential analyses. The Mann-Whitney or the Kruskal-Wallis test was used for the evaluation between score and age, time between injury and surgery, and follow-up time. For the analysis between subjective evaluation and age, time between injury and surgery, and follow-up time, the Mann-Whitney test was used. Spearman's correlation test was used to evaluate correlation between sensitivity and age, time from injury to surgery, and follow-up time.

The inclusion criteria were patients with acute trauma (compression, avulsion) in any finger of the hand. Exclusion criteria were infections; prior surgeries on the injured finger; tumors; severe osteoarthritis of the joint; systemic diseases, such as psoriasis, lupus erythematosus, Raynaud's disease, iron deficiency anemia, and hemochromatosis, and heart or lung disease.

Patients' age ranged from 16 to 67 years (mean of 40); 20 (90.9%) patients were male. The extent of pulpal loss was determined immediately after adequate debridement in all injuries; it was measured in square centimeters with the aid of a sterile ruler. **Table 1** presents the descriptive analysis of all the numerical variables contained in the database.

After healing, the fine sensitivity in the injury area was assessed. The two-point discrimination test (2PD; Weber test)

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