

Indigenous Little Finger Prosthesis: Cost-effective Option During COVID-19

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Abstract

The pain of losing a part of the body can put any individual into anxiety and can disable him psychologically and physically. The concealment of an amputated appendage using a prosthesis can prevent social stigma, bring back the confidence as well as can help in the improvement of physical function to some extent. The Prosthesis must be economical, comfortable, lightweight, durable, cosmetically appealing, and easy to wear. The treatment of any amputee completes only with the complete rehabilitation. The commercially available prosthesis is costly and during the COVID-19 lockdown, many of the prosthesis making units were non-functional. Then the option to complete the rehabilitation is to go for the indigenous prosthesis. In this article, we share our experience of making simple, cost effective and modest prosthetic options to a patient who lost her little finger following a full thickness electrical burn.

Keywords: COVID-19; Electrical Burn; Finger Prosthesis; Little Finger Amputation.

INTRODUCTION

Electrical burn injury (EBI) can be associated with significant morbidity and mortality. EBI can occur at home, or during workplace accidents.¹ The injury may be due to high voltage or low voltage current. The spectrum of presentation ranges

from minor to life threatening events, causing multisystem complications, or sometimes it can produce burns that can be deep and can result in the loss of appendages.

Prosthetics is an amalgamation of art and science that can provide a natural appearance to the lost appendage. Finger and partial finger amputations are some of the most frequently encountered forms of losses. Unfortunately, loss of even a single finger can produce significant aesthetic and functional deficiency.² The prosthesis should be economical, easy to apply, cosmetically appealing, and easily available. There are many prosthetic options available, the selection of which one to use depends on the level of amputation.

But the COVID-19 lockdown has brought about severe resource limitation and most of the prosthesis making units went into complete shutdown. In such a situation the lifeboat available

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is to mobilize the resources available and to go for indigenous prosthesis.

MATERIALS AND METHODS

This study was conducted in the department of Plastic Surgery at a tertiary care center. The study was done after getting the departmental ethical committee approval. Informed written consent was taken from the patient. The details of the patient in the study are as follows:

A 40 years old female without known comorbidities was admitted with history of accidental electric burns from a low voltage source, she sustained circumferential 3rd to 4th-degree burns over the left little finger with loss of vascularity and 2nd degree burns over the medial aspect of the ring finger in the proximal phalanx, following which the left little finger was amputated. The resultant raw area was treated with standard wound treatment protocol and physiotherapy. When the wound was completely healed the prosthesis was considered for rehabilitation. But the commercially available ones are costlier than the patient could afford and the COVID-19 lockdown has led to the severe shortage of other options as well as the logistics.

So, the patient was provided with an indigenous finger prosthesis option. The prosthesis was made of acrylic and held with the latex rubber gloves.

Steps of making acrylic prosthesis:

Step I: An impression tray was made from wax sheet, dimensions of which was taken from the corresponding finger on the opposite hand.

Step II: An alginate impression material was made and poured into the impression tray.

Step III: Impression was taken from the opposite hand finger was taken by dipping into the impression material and keeping it immersed for 2 minutes and leaving space for mirror image modifications.

Step IV: After the finger is removed the impression is modified as per the measurements taken from the affected hand.

Step V: Acrylic polymer was monomer in correct proportion and tapped well and waited for the dough stage to set in, following which it was transferred into the modified impression tray.

Step VI: after setting the finger prosthesis is removed, sharp edges trimmed, polished and modified to fit the affected hand defect.

The prosthesis can be held with, a rubber band, a metal ring over the buddy finger, adhesives or simply using rubber gloves, the advantages of using rubber gloves is, it holds the prosthesis well, gives more stability meantime preventing the wound area from direct exposure to sunlight, the disadvantage is the color of the rubber gloves can attract more attention to the injured hand.



Fig. 1: Condition of Finger at admission



Fig. 2: Amputation stump, healed with sutures in-situ



Fig. 4: Making of the Impression Tray



Fig. 3: Materials used for making acrylic prosthesis



Fig. 5: Modifying the Prosthesis while the dough sets



Fig. 6: Set prosthesis before trimming and polishing



Fig. 7: Acrylic prosthesis held using a latex gloves

RESULTS

The feedback taken from the patient showed a good amount of satisfaction, The gloves held the prosthesis well in position.

DISCUSSION

Electrical injury results in a substantially greater risk of injury to nerve, muscle, bone, and skin, with more complications and short and long term morbidity.² Loss of any appendage affects aesthetics appearance functionality, and if the hand fingers are involved it will impact dexterity. The surgical reconstruction of the amputated digits may not be a feasible option for many patients due to various reasons and they can be more benefitted with prostheses. The primary purpose of any prosthesis is to allow the patient to pass unnoticed, and concealment of prosthesis usage is an effective coping strategy.³

Limitation of the study

This study was done only at a single center, with a single patient, large randomized control study involving multiple centers is required to substantiate the result of the study.

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Conflict of interest: None

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