

Innovative Dynamic Splint in Prevention of Recontracture in Postburn Contracture

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ABSTRACT

Research: Post burn contractures of the hand are very common. The most important aspect of release of these contractures is to provide a functional hand. As a part of rehabilitation it is important to maintain the release and to give adequate physiotherapy to prevent stiffness of fingers. We have devised an innovative dynamic splint to prevent recontracture. **Results:** Patient didn't develop re-contracture after 2 months of surgery. Patient advised to use it for 4-6 months. **Conclusion:** Re-contracture can be prevented with the use of dynamic splint in cases of post burn contracture.

Key words: Dynamic splint, postburn contracture, recontracture

INTRODUCTION

H and is especially a risky part in regards to the burns due to its exposure and the importance of its functionality.^[1] Even if the burned area is small, the thermal damage and contracture can affect the functionality of the hand. The burn contractures of the hand may be treated with graft, local flap, regional flap, and microvascular flap.^[2] After the release, irrespective of the modality of cover, it is essential to maintain the release, by splinting. Majority of the times, this leads to surrounding joint stiffness. Splint is also very cumbersome to the patient. Passive and active physiotherapy is essential for achieving good functions of the hand.

Majority of the commercially available splints will not be useful in patients with multiple contractures with various contracture angles. Hence, the splints have to be customized, which are expensive. Majority of the time plaster of Paris splints are made for the specific patients. However, these splints will be heavier and can cause skin irritation. These also hinder the dressing and the monitoring of the flaps/graft. We have devised a lightweight, cost-effective, and dynamic splint to prevent recontracture in patient in whom postburn contracture release has been done.

On Google search, we did not find any similar splint being used for postburn contracture.

METHODOLOGY

This study was conducted in the department of plastic surgery in a tertiary care center. Our patient was a 24-year female with postburn band contracture over the distal interphalangeal joint region of the left ring finger with apparent defect of 0.5 cm and true defect of 0.75 cm. Multiple Z-plasty was planned and executed as the limb length required would be less compared to a single Z-plasty [Figure 1]. The little finger was treated by soft tissue distraction using Joshi's external stabilization system fixator.

Intraoperatively, adjunctive therapy was given to prevent flap tip necrosis. Postoperatively, limb elevation physiotherapy was stared after the suture line healed. To

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Figure 1: Pre-operative postburn contracture of the left ring finger with multiple Z-plasty marking



Figure 2: Aluminum cloth hangar



Figure 3: Hangar bent to inverted U-shaped splint

help in complete mobilization of the finger, we have given an innovative, low-cost dynamic splint. It was made using an aluminum cloth hanger which was bent to U-shape. It was inverted and fixed to the proximal phalanx of the ring finger using elastic bandage. Blouse hook was fixed to the nail using cyanoacrylate glue. Rubber band was used to fix the finger in extension to the U-shaped splint and the hook



Figure 4: Splint fixed with Elastoplast and hook over the nail connected with rubber band



Figure 5: Splint being used by patient

[Figures 2-5]. Active and passive physiotherapy was taught to the patient.

RESULTS

The patient did not develop recontracture after 2 months of surgery [Figure 6]. The patient advised to use it for 4–6 months.

DISCUSSION

Burns represent serious injuries. Postburn contractures are difficult to rehabilitate due to joint and tendon contractures. Physiotherapy is of utmost importance to improve the overall outcomes. The primary purpose of the release of any of the hand contractures is to restore its function and movement.

Splinting is also essential to allow for wound healing, maintaining position and prevent recontracture. Larger



Figure 6: No recontracture – 2 months after use of dynamic splint

splints will cause immobilization of the other unaffected fingers which will lead to stiffness.

A study done by Bee Lan and Maitc suggests that the total range of movements achieved at 3 months is only approximately 45%.^[3] Exercises are the essential part of the rehabilitation after the burns and rehab programs are based on the characteristics of a patient and burns. The aim of the exercises is to maintain strength and condition and to fight against contracture of cicatrix.^[4]

We have devised an innovative dynamic splint which helps to:

- a. Maintain the release and keeps finger in extended position
- b. Allows for easy visualization and easy change of dressing of the graft/flap done after release
- c. Adequate mobilization of the finger passively and later actively
- d. Easy to apply and lightweight
- e. Is cost-effective (Rs. 20).

We have noticed the splint is useful in maintaining position, especially for night time splinting. Passive and active physiotherapy can be done with or without the splint. Slightly educated patients can themselves remove and reapply it.

The disadvantage may be that it is slightly large in size and may be difficult to apply in patients with associated web space contractures.

CONCLUSION

Recontracture can be prevented with the use of dynamic splint in cases of postburn contracture.

Limitations

Large randomized control trials required to support our results of efficacy of the dynamic splint in postburn contracture.

AUTHORS' CONTRIBUTIONS

All authors made contributions to the article.

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How to cite this article: Reddy CL, Chittoria RK, Aggarwal A, Gupta S, Lakshmi P, Mohan B, Shijina K, Pathan I. Innovative Dynamic Splint in Prevention of Recontracture in Postburn Contracture. Asclepius Med Res Rev 2019;2(2):1-3.