

Role of serial splinting in postburn contracture- Revisited

Chirra Likhitha Reddy, Ravi Kumar Chittoria*, Abhinav Aggarwal, Saurabh Gupta, Padma Lakshmi Bharathi Mohan, Shijina K, Imran Pathan.

Department of Plastic Surgery.

***Corresponding Author:** Ravi Kumar Chittoria, Department of Plastic Surgery Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER) Pondicherry India-605006. **E-mail:** drchittoria@yahoo.com

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Abstract

In the era of advanced surgical technique, correction of postburn contracture by serial splinting is often a forgotten art. In this case report we have revisited this old art by applying serial splint and achieving correction of elbow flexion contractures in one patient. Patient considered for this technique had thermal burn injury to the elbow that resulted in flexion contracture deformity. Treatment consisted of serial stretching and elongation of tissue followed by application of a cast in the position of maximal elbow extension. Almost full elbow extension was achieved in multiple sessions and was maintained after follow up period of six weeks. The use of casts in the treatment of elbow flexion contractures appears to be a viable option and can be used for mild contracture.

Keywords: post-burn; contracture release; splinting; management
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Introduction

Post-burn contracture is a common problem. There are various methods to manage post burn contracture including non-operative and operative. Among the non-operative management which is meant for mild contracture includes serial splintage physiotherapy and only splintage. Operative treatment includes surgical release of the contracture and covering the resultant defect by graft or flap. Usually mild contractures should be avoided with the surgical management because the surgical management has its own drawbacks. It include harvesting the skin graft from the donor site and then there will be donors site problem like-hypertrophied scarring . So mild contractors should be avoided with the surgical management and attempts should be given by non-surgical management. Serial splintage is known in the literature for ages together for contracture release but slowly it is losing interest in the era of surgeries. Through this manuscript we want to share our experience on serial splinting and its role as a non-operative treatment in the management of post burn contractures.

Methodology

This study was conducted in the department of plastic surgery during 2019. The patient was 40years female presented with the history of post burn contracture of 14 years duration. Patient had undergone the surgery 7 years back by surgical method (Z-plasty). But patient got re-contracture. On examination there was mild contracture at elbow with maximum extension was upto 140 degree.(Figure-1) X-ray was showing 134 degree extension. (Figure-2) Because of mild degree of contracture plan was to give non operative trial first and hence patient was taken under general anaesthesia , contracture angle was reassessed (Figure-3) and the under general anaesthesia when the muscles are relaxed the gently scar was stretched (Figure-4) and in that stretched

position a 6-8 layers of plaster of paris (POP) cast was given. (Figure-5) Then after a gap of one week again serial cast was given. In two stages of serial splintage, complete release was achieved. X- ray showed maximum extension of 162 degree. (Figure-6) The cast was replaced with volar aspect slab.(Figure-7) Patient was the discharge with almost complete contracture release and to prevent re contracture day time physiotherapy and night time splint was advised. Patient was follow-up weekly to ensure compliance with splint and physiotherapy.



Figure-1 (pre-operative maximum elbow extension)



Figure-2 (X-ray showing pre-operative maximum elbow extension)



Figure-3 (intra-operative assessment of elbow contracture)



Figure-4 (intra-operative image- stretching of elbow under general anaesthesia)



Figure-5 (intra-operative image- cast application in position of maximum extension)



Figure-6 (X-ray image after 2 weeks of serial stretching and casting)



Figure-7 (cast replaced with splint after 2 weeks)



Figure-8 (post-operative maximum elbow extension)



Figure-9 (post-operative maximum elbow extension)

Result

Pre-operative elbow angle was 146 degree, following two session of serial splinting one week apart, angle became 170 degree. The extension was maintained by day time physiotherapy and night time splint. After follow up period of 6 weeks the patient was maintaining the maximum extension of 170 degree.

Discussion

Joint contracture can develop due to a variety of reasons. However, majority of contractures seen in clinical practice are due to thermal burns. Postburn contractures are very common and severe in developing countries. Elbow contracture are very much functional limiting. Currently, there are two types of interventions for elbow contracture: operative and nonoperative treatment. The operative treatment involves open or arthroscopic release, arthroplasty, and manipulation under anesthesia . Although these are efficient treatments, surgery and manipulation under anesthesia are complex and tend to cause

neurovascular complications as well as recurrence. The nonoperative treatment mainly involves passive or assistant movement, continuous passive movement, serial bracing, and static and dynamic orthoses

Splinting of joint in anatomical position has been described as an effective preventive strategy. Splints and their application techniques varies among different authors. Richard et al. reported the use of static splinting in preventing contractures. But the controversies regarding splinting has been reported in the literature and reviewed from time to time. There are reports in the literature which have raise questions on the utility of static splinting. With the advance in surgical field, this non-operative approach lost its popularity.

Our experience though does suggest that serial static splintage improves the movement range across the joint. Results suggest that significant difference is seen in the range of movement by static splinting in our study. We believe that such application of serial static splinting might have significant role in managing contractures in the developing world. The described therapy protocol gives patients a realistic chance of avoiding surgery and ensures good patient compliance where surgery is eventually required.

Conclusion

In review of literature we have found that once serial splinting was gold standard and time tested method. We have used this method in our patient and found it effective. But since it is a single patient study, larger study having large number of cases is required to substantiate our finding.

Conflicts of interest

None.

DECLARATIONS

Authors' contributions

All authors made contributions to the article

Availability of data and materials

Not applicable.

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Consent for publication

Not applicable.

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