



STUDY ABOUT THE EFFECTIVENESS OF SERIAL STRETCHING IN POST BURN ELBOW AND KNEE FLEXION CONTRACTURE

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Abstract

Introduction: Human beings are unique creation of god, as they have an upper limb which is distinctly different from the lower limb. Evolution of human race has allowed us to have a complex amount of movements in the limbs. To study about the effectiveness of serial stretching in post burn elbow and knee flexion contracture.

Materials And Method: From the patients admitted, or attending the out patient department, detailed history about the following are taken, 1. Information about the nature of the injury, 2. Date of the injury, 3. Treatment history of the wound, 4. Previously done Surgical procedure, 5. Whether splinting was done while wound was healing and after wound has healed and, 6. Follow up care. Local examination of the joint include assessing the, 1. Extent of the scar, 2. Maturity of the scar, 3. Presence of blister, raw area, ulceration or scar breakdown, if present is noted. 4. Degree of Contracture, 5. Active and passive range of joint mobility, 6. Condition of the proximal and distal joints and, 7. Associated other deformity.

Results: Total of 50 cases were selected for the study during the period. All the 50 patients were corrected by serial stretching: 1. Average time at which the patients report to the hospital, after developing contracture was 4.31 months, and it ranges from 20 days to 10 months, 2. Flame burn was the commonest cause of burns, 3. Female gender was commonly affected and the age group was 16 - 25 years in Elbow contracture and 5 - 15 years in knee contracture, 4. Elbow contracture being the commonest one, account for 82.6% of the total contracture, 5. Degree of contracture commonly reported was, more than 60° for the elbow joint and 30-60° for the knee joint, 6. All patients had full correction of flexion deformity, 7. Average time taken for full correction of flexion deformity was 37.94 days for elbow contracture and 47.25 days for knee contracture. 8. 13 patients amounting to, 68.4% of the total elbow contracture patients and all the patients with knee contracture had associated deformity. 10 patients with elbow contracture and 2 patients with knee contracture had simultaneous correction of the associated deformity. 9. 5 patients with elbow contracture and 2 patients with knee contracture had developed blister. One patient with elbow contracture and one patient with knee contracture had scar break down. All of them settled with conservative management, 10. 6 patients with elbow contracture and 2 patient with knee contracture had discontinued the splint and had developed recurrence of contracture after correction by serial stretching, which was again corrected with serial stretching.

Conclusion: Serial stretching is a good modality of treatment for correcting post burns flexion contracture of the knee and elbow. It can be used as an out-patient procedure without anesthesia and can be applied to all age group. Slow progressive and prolonged stretching helps in full correction without serious complication. Patients and their parents need good motivation, as prolonged follow up and after care, in the form of pressure garment, splint, scar massage and exercise are necessary.

Keywords: Serial Stretching; Post Burn Elbow ; Knee Flexion Contracture.

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INTRODUCTION

Human beings are unique creation of god, as they have an upper limb which is distinctly different from the lower limb. Evolution of human race has allowed us to have a complex amount of movements in the limbs. The hands are the eyes of the blind, the tongue of a dumb and the aid of the deaf to communicate. The upper limbs have to extend bend and hold. The lower limbs have to be straight, strong and move. Burn injury is a systemic illness and its severity is usually assessed, if not by patient's survival, by the consequence of the burn injury i.e. scar hypertrophy, contracture and structural deformities due to loss of body components. Body deformity is closely related to the magnitude of the injuries i.e. extend and depth of injury, mode of intervention, physiotherapy and follow-up care. Formation of Scar tissue at the wound site and contraction of the scar tissue are the normal consequence of an injury. Although the exact mechanism accounting for the sequential change in wound healing and scar formation remain incompletely understood, wounds with infection and or allowed to heal spontaneously tend to form scar that are thickened and contracted circumferentially, mediated by various fibrogenic cytokines especially TGF β . The upper limbs which tried to rescue a burning victim needs the supportive care. Proper and timely care of the scar prevent, the formation of the deformity. This study is an effect to find out the effectiveness of stretching the scar both in the upper and lower limb at the level of elbow and knee. Though the act of stretching and splinting is tender, the results are dynamic in outcome.

MATERIALS AND METHODS

This was the prospective interventional study. After admission in our department a detailed

history of patient was taken as well as general condition of patients was assessed, From the patients admitted, or attending the out patient department, detailed history about the following are taken, 1. Information about the nature of the injury, 2. Date of the injury, 3. Treatment history of the wound, 4. Previously done Surgical procedure, 5. Whether splinting was done while wound was healing and after wound has healed and, 6. Follow up care. Local examination of the joint include assessing the, 1. Extent of the scar, 2. Maturity of the scar, 3. Presence of blister, raw area, ulceration or scar breakdown, if present is noted. 4. Degree of Contracture, 5. Active and passive range of joint mobility, 6. Condition of the proximal and distal joints and, 7. Associated other deformity.

RESULTS

During the course of the study, a total of 50 patients were chosen for participation, From March 2021 through March 2023 inclusively all of those months. The adjustments were of assistance to each of the fifty patients.

A succession of stretches-

1. The average amount of time that passes before a patient visits the hospital following the onset of contracture is 4.31 months, however this number can range anywhere from 20 days to 10 months.
2. Burns from open flames were the most prevalent type of burn.
3. Females were more likely to be impacted, and the age range that was most usually affected was between 16 and 25 years old for elbow contracture and between 5 and 15 years old for knee contracture.

TTABLE-1:-EELBOW CONTRACTURE-AGE/SEX DISTRIBUTION

Age	Male	Female	Total
<5yrs	2	0	2
5-15 yrs	0	2	2
16 -25 yrs	4	14	18
26 -35 yrs	2	10	12
36 -45 yrs	2	2	4
>46yrs	0	0	0
TOTAL	10	28	38

TTABLE-2:-KKNEE CONTRACTURE-AGE /SEX DISTRIBUTION

Age	Male	Female	Total
<5yrs	0	0	0
5 -15 yrs	3	5	8
16- 25 yrs	0	4	4
26- 35 yrs	0	0	0
36- 45 yrs	0	0	0
>46yrs	0	0	0
TOTAL	3	9	12

4. The elbow contracture, which is the most prevalent kind, is responsible for 82.6% of the over all number of contractures.
5. The degree of contracture that was typically

recorded was between 30 and 60 degrees for the knee joint and more than 60 degrees for the elbow joint.

TTABLE-3:-DEGREEOFCONTRACTURE-ELBOW

Degree	Male	Female	Total
<30°	6	6	12
30-60°	0	12	12
>60°	4	10	14

ASSOCIATED DEFORMITY CORRECTION

6. The flexion deformity in all of the patients was completely corrected.

The average amount of time it took to fully correct the flexion deformity in the elbow was 37.94 days, whereas the amount of time it took in the knee was 47.25 days.

TABLE-4:-ASSOCIATED DEFORMITYCORRECTION

	ElbowJoint Contracture	Knee Joint Contracture	Total
AssociatedDeformity	26	8	34
Simultaneouscorrection	20	4	24

TABLE-5 COMPLICATIONS-KNEECONTRACTURE

COMPLICATIONS	MALE	FEMALE	TOTAL
ScarBreakdown	2	0	2
Blister	2	8	10
Neuro-VascularCompromise	0	0	0
RecurrenceofContracture	8	4	12

8. Thirteen individuals, which is equivalent associated deformity was present in 68.4% of the total number of patients who had elbow contracture, while it was present in 100% of the patients who had the knee is contracting. The treatment of the associated deformity at the same time was performed on ten patients who had elbow contracture and two individuals who had knee contracture.
9. Those who had elbow or knee contractures were more likely to develop blisters than those who had elbow contractures. Scar tissue had broken down in one patient who had elbow contracture, and in another patient who had knee contracture. Every single one of them compromised with traditional management
10. Six patients who had elbow contracture and two patients who had knee contracture stopped wearing their splints and suffered a recurrence of their contracture after having been cured by serial stretching. This return of their contracture was once again repaired by serial stretching.
11. Surgeon's satisfaction was found to be more in serial stretching of contractures. 64% vs 60% in the very satisfied criteria and 8% vs 12% in the extremely satisfied criteria.
12. P-value <0.05 considered statistically significant.
13. Most of the patients were satisfied with the treatment of serial stretching of contracture of elbow and knee.

DISCUSSION

Joint involvement in burn injuries is extremely uncommon, regardless of the cause of the burn. Burns, on the other hand, frequently result in a dysfunctional state of the joints. Burn patients often suffer from joint issues and deformities, the majority of which may be due to a lack of physical activity mixed with a restriction in joint movement as a result of scar contracture.

First treatment for burns during the acute stage focuses on resuscitating the patient after they have experienced burn shock by administering intravenous fluids, analgesics, and antibiotics. This is the primary focus of first burn therapy. The severity of the burn will dictate the treatment that is administered to the wound. A dressing made of collagen is applied to the wound on the skin's surface. In order to avoid surgical intervention is necessary for wounds that have not healed after twenty one days have elapsed because this prevents secondary intention and contracture deformity from preventing the lesion from healing. If it takes a wound more than two weeks to heal, there is a very good chance that it will result in a

hypertrophic scar. Therefore, until the scar has completely healed, pressure garments should be worn to prevent hypertrophic scarring fully developed.

CONCLUSION

It is possible to prevent the formation of contractures by beginning early usage of splints, maintaining good posture, and engaging in mobilisation. It is imperative that the pressure treatment and splinting be maintained until the scar has completely healed matured in order to reduce the risk of scar hypertrophy and a subsequent return of the contracture.

INFORMED CONSENT: written informed consent was taken from patients.

ETHICAL APPROVAL: ethical committee approval was taken from the institutional committee of ethics.

SOURCE OF FUNDING- funding source was self

CONFLICT OF INTEREST – there was no conflict of interest

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