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Study about the Effectiveness of Serial Stretching in Post Burn Elbow and Knee Flexion Contracture

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INTRODUCTION

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®.

The thickened and contracted scar tissues, changes that are normal and expected consequence of wound healing process are microscopically composed of collagen, arranged in whorls and nodules. The changes may be observed as early as 3 to 4 weeks following the injury and they are cosmetically unsightly and functionally disturbing Scarring secondary to burns leads to a multitude of adverse medical consequences including loss of function, restriction of joint mobility, restriction of growth, altered appearance and adverse psychological effect When the upper limb is at rest, it relaxes the muscles, tendons and joint

capsules and when prolonged the rest, leads to contracture and deformity. The hands are no longer capable of full function and the mobile part of man becomes an unaesthetic prong from the body. Similarly when the lower limb is bend, the person is unable to be on his feet. Early mobilization and splinting does miracles, by not only restoring the anatomical shape and size but also retains the function. 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.

Aim of the Study

To study about the effectiveness of serial stretching in post burn elbow and knee flexion contracture.

Objective

1. To study about the amenability of the post burn scar to stretching.
2. Average time needed for full extension
3. Relationship between age of scar and time needed for full extension
4. Complications of Stretching
5. Effectiveness as an adjunct procedure in a patient with multiple contracture, while the more important areas are getting surgical treatment.

Materials and Method

From the patients admitted, or attending the outpatient 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 23 cases were selected for the study during the period, November 2006 – March 2009. All the 23 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. Cotton padding with elastocreep bandage helps in reducing blister formation which is very common with compression stocking. Blister formation is the commonest cause for discontinuation of pressure garment and splint. Serial stretching being another tool in the armamentarium of burns surgeon helps in the simultaneous correction of multiple deformities or in patients with high chance of hypertrophic scarring or when surgical correction is not possible. Early splinting, proper positioning and mobilization helps to prevent development of contracture. Splinting and pressure therapy has to be continued till the scar fully matures, to prevent scar hypertrophy and recurrence of contracture.

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