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Original Research Article

Management and outcome in patients with post burn contracture

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ABSTRACT

Background: Post burn contractures are distressingly common and severe in developing nations and considered as a significant problem in developed countries as well. Despite advances in the overall management of burn injuries, severe post-burn contractures continue to be a formidable foe for reconstructive surgeons in developing countries.
Methods: The study was carried out in Department of Surgery, Himalayan Institute of Medical Sciences, SRH University, Swami Ram Nagar, Dehradun over a period of 12months. Cases of the post burn contractures attended in the O.P.D were included in the study.
Results: Contracture release with split thickness skin grafting STSG in 25 (55.5%) cases. Contracture release with STSG with flap cover was performed in 7 cases (15.5%), contracture release with K wire insertion with coverage was performed in 8 cases (17.7%) and Z plasty was performed in 5 cases (11%).
Conclusions: There have been major advances in burn care in the last three decades and the mortality rates have gone down significantly. The management has shifted to improvement of functional outcome and better quality of life. Proper planning of reconstructive procedures, rehabilitation, restoration to pre-injury status and return to society are the goals that the treating team hopes to achieve.

Keywords: Management, Outcome, Post burn contracture

INTRODUCTION

Burn related deaths are only part of the problem, for every person who dies as a result of their burns, many more are left with lifelong disabilities and disfigurements.[1] Burns are a major, global public health problem, resulting in an estimated 195,000 deaths annually.[2] Survival is no doubt the immediate concern, it is the restoration to pre-injury status, and return to society which becomes important for the victim and the treating team.[3]

Post burn contractures are distressingly common and severe in developing nations and considered as a significant problem in developed countries as well. Infants rolling into unprotected fires or explosions of poorly made stoves are the most common causes of these burns in developing world.[4] Despite advances in the overall management of burn injuries, severe post-burn contractures continue to be a formidable foe for reconstructive surgeons in developing countries.

Not only a higher incidence of burn injuries, but also lack of ideal facilities for managing acute burn subjects are concerning features in these countries. These factors are further compounded by ignorance, poverty, and inadequate utilization of available health care facilities.

The resultant post-burn contractures are often severe, long standing, and with secondary complications. Management of these problems may account for up to 50% of a general plastic surgeon's workload.[5]

The incidence of post-burn contractures is extremely high in our country. Quite often, they are not only multiple in each subject but also very severe and diffuse. The burn subjects are treated by a variety of service providers who aim at closing the raw wounds and this leads to invariable development of wound contraction and scarring.[6]

METHODS

The study was carried out in Department of Surgery, Himalayan Institute of Medical Sciences, SRH University, Swami Ram Nagar, Dehradun over a period of 12 months from 1st January 2016 to 31st December 2016. Cases of the post burn contractures attended in the OPD were included in the study after obtaining a written informed consent" and ethical clearance. This was a descriptive observational study with 45 cases of post burn contractures who presented in the OPD were taken up for the study.

The subjects with post burn contractures of either age and sex were included and the patients who refused to give consent were excluded. All the subjects with post burn contractures presenting in the OPD and satisfying the inclusion and exclusion criteria were included for the study. After a well written informed consent, following information was collected to generate data for the study.

Demographic and other required general information such as name, age, gender, address, date of admission or discharge and duration of hospital stay.

Relevant detail medical history such as chief complaints in chronological order, mode of injury, time of onset of contracture, site of contracture. Relevant general and specific medical examination. Details of the subjects in terms of details of site of contractures and subsequent medical evaluations done were recorded. Details of surgical procedures done and there outcome were recorded.

Data was analyzed by using statistical software SPSS 22. Qualitative variables were represented in form of frequency and percentage. Quantitative data was represented in form of Mean±Standard deviation.

RESULTS

The operative procedures performed on the patients comprised complete release of contractures followed by resurfacing with skin grafts and flaps. The various resurfacing procedures employed alone or in combination included contracture release with split thickness skin grafting STSG in 25 (55.5%) cases.

Contracture release with STSG with flap cover was performed in 7 cases (15.5%), contracture release with K wire insertion with coverage was performed in 8 cases (17.7%) and Z plasty was performed in 5 cases (11%) (Table 1).

Table 1: Distribution according to the surgical intervention in this institute.

Type of surgical intervention in our institute	No. of cases (n=45)	%
Z plasty	5	11.11%
Contracture release+SSG	25	55.5%
Contracture release + flap cover +/-SSG	7	15.5%
Contracture release with K wire insertion with coverage	8	17.7%

Post operatively, 42 patients (93.33%) had a good surgical outcome the flaps and grafts were taken up. In 3 patients there was minimal graft loss but that did not need any surgical intervention and there was complete healing with dressings (Table 2).

Table 2: Distribution of cases in terms of surgical outcome.

Surgical outcome	No. of cases (n=45)	%
Good graft take	42	93.3
Complication (minor graft loss)	3	6.6

All cases were followed up after 3weeks and 6weeks from surgery. At 3weeks follow up, 8 (17.7%) patients underwent K wire removal and were advised physiotherapy. Physiotherapy and night splint age was advised in 18 (40%) cases and physiotherapy alone was advised in 19 (42.2%) cases (Table 3).

Table 3: Follow up course after 3weeks post procedure.

3weeks follow up	No. of cases (n=45)	%
K wire removal+physiotherapy	8	17.7
Physiotherapy alone	19	42.2
Physiotherapy with night splint age	18	40

At 6weeks follow up, 2 patients were admitted for release of contracture at another site. There were 6 patients, who had been advised physiotherapy in previous visit, but they were not following the instructions these patients were re-counseled and were asked to follow the advice.

The remaining 37 patients showed satisfactory result and were happy with the outcome (Table 4). Functional restoration was satisfactory in 42 (93.3%) with complete range of motion patients while in 3 patients (6.6%), range

of motion was not optimal. These were patients who were not following the physiotherapy and splint age instructions properly. These patients were restressed about the need for proper physiotherapy (Table 5).

Table 4: Follow up course after 6 weeks post procedure.

6weeks follow up	No. of cases (n=45)	%
Re-admission (for contracture release at another site)	2	4.44
Physiotherapy restressed	6	13.33

Table 5: Distribution of cases in range of motion (ROM) satisfaction.

Range of motion	No. of cases (n=45)	%
Satisfactory	42	93.33
Non-satisfactory	3	6.67

DISCUSSION

The purpose of every surgical operation is to carry out a stable coverage of the involved area and to avoid recurrence of contracture or chronic ulcers or breakdown. Various type of surgical procedures was undertaken for treatment of post burn contractures. 25 cases (55.5%) underwent contracture release with split skin graft while 7 cases (15.5%) underwent contracture release with flap coverage surgery with or without SSG, 8 (17.7%) patients underwent contracture release with K wire insertion with coverage and 5 patients (11.1%) underwent Z plasty.

In a study done by Iwuagwu FC et al, a total of 129 patients underwent skin grafting for release of contractures as opposed to any other method of correction.[7] Full-thickness skin grafts were used in 81 patients (63%) and split-thickness skin grafts in 26 (20%). Twenty-two patients (17%) had both types used on different occasions. It was found that for the same site, release with split-thickness skin grafts was associated with more release of the contracture than with full-thickness skin grafts (43).

In the series by Adu EJ, seventy-one surgical procedures were performed including release and flap repair (33 cases), full thickness skin graft (23 cases) and partial thickness skins graft and splinting (6 cases).[8]

In a study conducted by Saaiq M et al, the various resurfacing procedures employed alone or in combination included STSG/FTSG (191 cases), Z-plasties (66), supraclavicular artery flaps (15), abdominal flaps (3) and posterior interreous artery flap" (1). Contracture release with Skin graft (41%) and local flap (46%) were the most common surgical procedures performed in the series conducted by Kraemer MD et al.[5,9]

Various types of operative procedures have been proposed to treat burn wound contractures. In the selection of a surgical procedure, several factors must be considered, including the amount of scarring of the skin adjacent to contracture, anatomic area involved and the function needs of the patient. In this study, most patients (42=93.33%) had a good graft take while there was minor loss of graft in 3 patients which healed with dressings.

In the study by Saaiq M et al, the majority of patients (174=83%) had satisfactory graft take while (17=8.9%) had poor graft take.[5] In this series, cases were followed up for 3 and 6weeks. All patients came for regular follow up after 3weeks from surgery. At 3weeks follow up, 8 (17.7%) patients underwent K wire removal.

Physiotherapy and night splint age was advised in 18 (40%) cases and physiotherapy alone was advised in 19 (42.2%) cases. At 6weeks follow up, 2 patients were admitted for release of contracture at another site and 6 patients were restressed for physiotherapy as they were not following the earlier advise and rest all patients had no complication.

In a study done by Balumuka DD et al, 58 patients underwent contracture release of axilla and shoulder. The study noted that there was a high incidence of recurrence of contractures (52%). The study postulated that the risk factors for recurrence were flame burn (p=0.007), duration of PBC of more than a year (p=0.018), and incomplete release of the contracture (p=0.002).[10]

In our series, functional restoration was satisfactory in 42 (93.3%) patients while in 3 patients (6.6%), range of motion was not optimal. These were the patients who were not following the physiotherapy and splint age instructions properly. In the series by Kraemer MD et al, restoration was possible in 88% of the procedures while only 12% of the cases provided unsatisfactory result. Kraemer MD et al, also reported that the poorest result was that of the neck which had a 33% of the unsatisfactory release.[9]

CONCLUSION

There have been major advances in burn care in the last three decades and the mortality rates have gone down significantly. The management has shifted to improvement of functional outcome and better quality of life. Proper planning of reconstructive procedures, rehabilitation, restoration to pre-injury status and return to society are the goals that the treating team hopes to achieve.

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