

# Postburn Mentosternal Contractures- Split Skin Graft Remains the most Workable Option.

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We present our three years experience in management of post-burn mentosternal contractures. Split thickness skin grafting was found to be the only workable option in 64 out of 75 patients after release of contracture and excision of scar tissue. In our set up, mentosternal contractures are usually very severe due to negligence and delayed treatment and most of the other reconstructive options may not be applicable. With rehabilitative measures like splintage and regular massage in post operative period, good functional and acceptable aesthetic results can be achieved.

**Key Words:** burns, contractures, plastic surgery

Neglected second and third degree cervical burns can lead to severe contractures that might be an extremely disabling condition. Early skin grafting and proper splintage may prevent this complication in our set up, patients often accept such a disability at the initial stage and do not seek medical advice until the contracture becomes quite severe. In established contractures, the neck develops a fixed flexion deformity with limited extension and rotation. Many options for reconstruction after release of these contractures are available depending upon the exact site and extent of involvement and availability of donor site. Apart from skin grafting, most of the other reconstructive modalities are not feasible due to severity of the problem. In this paper, we present our experience in the management of severe mentosternal contractures along with review of literature.

## Patients and Methods

This study was carried out at The Department of Plastic and Reconstructive Surgery, Mayo Hospital Lahore, from January 1996 to December 1998. All cases presenting with post burn contractures of the mentosternal region were included in the study. All the patients were dealt as elective cases, only when scar was mature (i. e. at least 6months after the injury). Haematinics and nutritional supplements were prescribed in the preoperative period where indicated. Two units of blood were cross-matched prior to surgery. All patients were given antibiotic perioperatively. Contracture and scar tissue was outlined with skin marker. Area was infiltrated with 1: 100,000 adrenaline to minimize bleeding. After contracture release and scar excision, hemostasis was secured. If possible, a skin flap from lateral cervical areas was brought to the front of neck to achieve better aesthetic result. Band contractures were released using z-plasties. In most of the cases only a split thickness skin graft was the possible solution. Sheet grafts were used for chin and neck region, while wide chest area defects were covered with 1:3 meshed grafts. 4/0 silk was utilized to secure the graft in place. A single layer of tulle grass, with squeezed wet thick cotton layer, wrapped with crepe bandage was used to immobilize the graft and make it sit firmly on bed. At times, tie over dressing was also utilized to immobilize the

graft. First dressing was changed at 3rd postoperative day and any small hematoma or seroma were drained using surgical blade no 11. Stitches were removed at about seventh day. Patients were strictly advised to keep the neck extended with pillows under the shoulders.

As soon as the grafts healed completely, usually at 10 to 12th day post operatively, patients were advised to massage the area with olive oil and were prescribed a hard cervical collar. Patients were followed up at 1 month, 3 months and 6 months intervals and results recorded. Function and cosmesis were the criteria used to determine the effectiveness of the procedure.

Function was evaluated in reference to neck movements and cosmesis was defined as the appearance of the graft by its color and texture. The result was rated 'Very Good' if good match to surrounding skin and 80-100% of normal movement range was achieved. A 'Good' result had acceptable appearance with 60- 80% movements, whereas 'Satisfactory' result meant a reasonable appearance and 50-60% movements. Results were declared 'Poor' in case of hypertrophic scars, wrinkling of the grafted skin and an unacceptable range of movement.

## Results

During three years period, a total of 75 patients with post burn mentosternal contractures were operated upon with 19 males and 54 females (male: female = 1:2.9). Problem was more common in the teenage group, both in males and females. (Table no 1)

Table 1. Age and sex distribution

Age	Male	Female	n=
1-10'	4	4	8
11-20	5	26	31
21-30	4	19	23
31-40	2	3	5
41-50	4	3	7
51-60	-	1	1

After excision of scar and release of contracture, split thickness skin grafting alone was done in 64 cases, release with Z-plasty was carried out in 4 cases. In one patient Z-



## Split skin graft in Mastosternal Contractures

plasty was combined with skin graft. Reconstruction with local flaps was done in 4 patients, while procedure was carried out after tissue expansion in 2 of the cases. (Table no 2)

Table 2. Reconstructive modalities

Age	Male	Female	n=
SSG alone	16	48	64
Z-plasty	3	1	4
Z-plasty with SSG	1	-	1
Local flap	2	2	4
Local expanded flaps	-	2	2

Out of 64 cases where split thickness skin grafting was the only option, Very good (excellent) results were achieved in 18 cases, good in 28 cases, while satisfactory and poor results were achieved in 15 and 4 cases respectively. (Table no 3)

Table 3. Results

Very good	18
Good	28
Satisfactory	15
Poor	4

In our series, we had minor complications like partial graft loss or minimal flap necrosis in 10 cases. Except for 5 patients who had to be skin grafted again, all cases were managed conservatively. Recurrence of contracture was seen in 4 cases who were scheduled for secondary release



Figure no 1 shows pre-operative photograph of a patient with severe mastosternal contracture (front view), while



Figure no 2 is pre-operative photograph of the same patient (side view).

at a later date. Graft hyperpigmentation was observed in 5 patients. (Table no 4)

Table 4. Complications

Complications	n=
Partial loss of graft/flap necrosis	10
Recurrence of contractures	4
Graft hyperpigmentation	5



Figure no 3 shows early post-operative photograph of the same patient after release and skin grafting (front view).

### Discussion:

One of the commonest contractures, which we see among post burn complications, is the neck contracture<sup>2</sup>. In our set up, patients usually present very late when the problem is at an advanced stage, due to multiple reasons-illiteracy, ignorance, and financial burdens etc. Patients are often in constant pain, suffer from insomnia, life pattern is disrupted and patient may have sociopsychological problems. Neck contractures are often different from contractures elsewhere in the body. Loss of the platysma muscle bulk is irreparable and results of operation are not always satisfactory.<sup>2</sup> Patients need to be made aware of the difficulties and informed that the final results may not be up-to their expectations. However, as these contractures are disabling and interfere with function, they must be relieved as early as possible. Several methods have been described for release of this post burn complication. Thomas D. Cronin<sup>3</sup> (1961), described vividly the use of split skin grafts to cover the defect after the release. He stressed the use of a custom-made neck splint for over 6 months postoperatively. The jump flap procedure of Ezzar A. Gibraeli<sup>4</sup> is rather cumbersome. Local flaps usually do not provide enough bulk to replace the lost tissue<sup>5</sup> Staged reconstruction prolongs the hospital stay and burdens the patient economically. Advent of pedicle distant flaps, such as deltopectoral flap and pectoralis major flaps<sup>6,7</sup> was a huge advancement towards the reconstruction in this area. But these flaps have their own limitations. Donor site defects, smaller arc of rotation, smaller volume as compared to the extensive contractures and high number of complications and morbidity associated with these flaps limits their use. Segun Aranmolate, (1889)<sup>8</sup> suggested the use of bilobed flaps in the release of post burn mastosternal contractures but their use needs presence of



normal tissue around and almost always a midline Z plasty is required to effect the complete release, making it a two-staged process.

Where the use of local flaps is precluded by an inadequate amount of adjacent tissue, expansion provides a useful reconstructive option<sup>9</sup> But disadvantages are that it is not a single stage procedure, patient has to visit the surgeon frequently and regularly to get the expander to its size. An added adverse affect is that patient may find it difficult to carry out his social life activities with tissue expanders inserted. Above all, it may not be easily available and many of the patients are not able to afford it.

Free tissue transfer has become a common reconstructive procedure<sup>10</sup>, but demands a more sophisticated and technical equipment which is lacking at most of our centers. Most of our patients are poor, they come from remote areas, with extensive post burn contractures and minimum of normal tissue around. Therefore, we find that workable option in most of our cases remains simple split skin grafting after release of contracture.

The two main problems after split skin grafting are graft hyperpigmentation and recurrence of contracture. The cervical collar, which we regularly advise to these patients, helps to prevent contracture and at the same time minimizes graft hyperpigmentation by protecting it from ultraviolet light.

We have observed that if the patient strictly follows the regimen of regular massage in the postoperative phase<sup>11</sup> and keeps the neck splinted, function and the aesthetic results can be fairly reasonable.

## References

1. Muir I.F. K., Barclay T. L. and Settle J. A. D. Burns and their Treatment. Third edition. Butterworth. 1987. Pp151.
2. Nath. S., Erzingatsian K. and Simone S. Management of postburn contracture of neck. *Burns* 20, 438 (1994)
3. Cronin, T. D. The use of a molded splint to prevent contracture after split skin grafting on the neck. *Plast. Reconstr. Surg.* 27:7, 1961.
4. Gibraeil, E. A. The jump flap procedure in the treatment of burn scar contractures of the neck. *Br. J. Plast. Surg.* 289, 1978.
5. Shah, A. A. and Malik W. M. Head and neck cancer and reconstruction: *Annals of K. E. M. C. Lhr.* 5, 20. 1999.
6. Bakajamian, V. Y. A two stage method for pharyngoesophageal reconstruction with a primary pectoral skin flap. *Plast. Reconstr. Surg.* 36: 173, 1965.
7. Ariyan, S. The pectoralis major myocutaneous flap. Versatile flap for reconstruction in the head and neck. *Plast. Reconstr. Surg.* 63:73 1979.
8. Aranmolate, S. and Attah, A. A. Bilobed flap in the release of post burn mentosternal contracture. *Plast. Reconstr. Surg.* 83. 356. 1989.
9. Antonyshyn, O., Gruss J. S., Zuker R. and Mackinnon, S. E. Tissue expansion in head and neck reconstruction. *Plast. Reconstr. Surg.* 82. 58. 1988.
10. Harii, K. Ohmlori K. and Ommori, S. Successful clinical transfer of 10 free flaps by microvascular anastomosis. *Plast. Reconstr. Surg.* 53. 259. 1974.
11. Babar A. H., Ikram, M. S. and Cheema S. A. Experience with simultaneous release of upper and lower eyelids in post burn ectropion. *Annals of K. E. M. C. Lhr.* 5, 22. 1999