

PARASCAPULAR FLAP FOR RECONSTRUCTION OF SEVERE AXILLARY CONTRACTURE

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ABSTRACT

Axillary contracture is a challenging problem to the reconstructive surgeon owing to the wide range of abduction that should be achieved and due to the common unavailability of local tissues to be used for reconstruction of the axilla.

Patients and methods: Twenty patients with contractures of the axilla were treated in the plastic surgery unit of general surgery Department, Zagazig University in the period between May 2010 & June 2012. The patient's age were ranged between 6 and 38 years with a mean age 24 years of them 18 males and two females. Ten patients were due to post burn and the other ten were due to post traumatic axillary contractures. Parascapular flaps were done for all patients. **Results:** All flaps are survived. Functional improvement was quite satisfactory. The cosmetic result was also satisfactory in most of the cases except for two patients due to depression in their back scars and difficulty in adduction due to bulkiness of the flaps in the axilla.

We concluded that the parascapular flap is the best choice for reconstruction of severe types of axillary contracture, releasing defects with satisfactory results in terms of function and cosmesis.

INTRODUCTION

Contractures in this area are difficult to manage because of joint stiffness, difficulty in splinting, and the high recurrence rate with inadequate care. They are classified as type 1, which are those limited to the anterior or posterior axillary web, type 2, those involving both webs but sparing the cupola, and type 3, those with obliteration of the axilla (1, 2, 3). For broader contractures or type 3 contractures, fasciocutaneous flaps should have viability equal to muscle flaps with better cosmesis and should be considered the first choice. Medial arm or parascapular flaps are relatively simple with a high survival rate and also have good functional results reported (4, 5, 6). Fasciocutaneous flaps with scarred overlying skin can be used, but achieving primary closure of the donor site may not be possible (7).

PATIENTS AND METHODS

The study was conducted in the Plastic surgery unit, Zagazig University Hospitals in the period between May 2010 & June 2012. Twenty patients with axillary defects resulting from severe scar due to post burn or crushing injury were treated by parascapular flaps.

Preoperatively: History was taken with special concern on the cause of trauma and the initial management in the acute phase and the follow up physiotherapy which found to be the main cause of contracture as most of patients told they did not follow because of pain. General examination was

done to exclude any medical problem and looking for other deformities regarding burn cases. Then local examination done for the degree of contracture, which actually was 3rd one in our cases and lastly the condition of surrounding skin which was good in all cases. Preoperative flap design was done while the patient was standing and also some photographs were taken preoperatively according to patients acceptance.

Operative procedures: Under general anaesthesia while the patients in lateral position the recipient sites were released first then demands were assessed. Then the flap edges accordingly adjusted. Then start the dissection of the flaps inferiorly to include the latissimus dorsi fascia with the flap tip. The dissection is then continue towards the triangular space which is the origin of the flap feeding vessel (the descending branch of circumflex scapular) and at each time we assessed the inseting and in all cases we did not need to dissect the pedicle itself. The donor sites were closed directly in all cases.

Postoperatively: follow up visiting starting next day, one week, two weeks, one month and after 3 months. Patients starting active physiotherapy as early as possible and then by physiotherapist after removal of stitches.

There were eighteen men and two women, with a mean age of 24 years (range, 6 and 38 years). Parascapular flaps sizes were ranged from 12 to 24 cm in length and 5 to 8 cm in width.

Table (1)

| No of cases | Sex | | Age | | Cause | |
|-------------|------|--------|------|-----|-----------|--------------|
| | Male | Female | 6-30 | >30 | Post burn | Crush injury |
| 20 | 18 | 2 | 15 | 5 | 10 | 10 |

Table (2)

| Flap size(cm) | 24x3 | 20x6 | 18x6 | 22x7.5 | 12x5 | 18x7 | 21x7 | 16x6 | 23x8 |
|---------------|------|------|------|--------|------|------|------|------|------|
| Number | 1 | 3 | 1 | 4 | 2 | 2 | 4 | 1 | 2 |

RESULTS

Patient’s age ranged between 6 and 38 years with a mean age 24 years. Out of the twenty cases, the right axilla was involved in 10 cases (50%); the left was involved in 9 cases (45%) and both in one case (5%). The cause of crush injury in 10 cases was post RTA. The cause of burn was flame in 9 cases and only one chemical due to concentrated sulphuric acid. The duration since the injury in burn cases was ranging from 2-10 years with mean 72 months while those post crushing ranging from 1-3 months with mean 60 days. The type of contracture in all cases was 3rd type. The

degree of contracture was ranged from moderate (30-90 degrees) to sever (less than 30 degree). The degree of abduction in our cases was ranged from 0 to 60 degrees. In all cases parascapular flaps were done. The degree of abduction reassessed postoperatively. The degree of postoperative abduction was ranged from 110 to 270 degrees.

The degree of patient satisfaction was all satisfied by the results except two dissatisfied by back scar and difficulty in full adduction due to bulkiness of the flap in the axilla.

Photographs of some cases

Case 1:



Preoperative



Flap marking



Flap elevation



Flap inseting



2 weeks postoperative

Case 2



Preoperative



Flap marking



Flap inseting

DISCUSSION

Covering large defects in the axillary fossa can be challenging because of its complex shape. A variety of local skin, fasciocutaneous and musculocutaneous flaps have been described, with a number of inherent advantages and disadvantages (8).

In our study the main cause of this contracture especially in burn cases was the reluctance in physiotherapy. Intensive exercise program under physical therapist supervision combine to give the patient the best chance of surviving his injury with minimal loss of function. Such a program is not easy for the patient who is experiencing severe pain or for the therapist who must insist that he moves the extremity in spite of the pain, but serious impairment of function will most surely result if it is not done (9).

Almost all the studied cases gave history of no or minimal physiotherapy and splinting of the axilla in the acute phase which was essential to minimize secondary deformities (9, 10, 11).

The cutaneous gliding capacity of the shoulder area skin is important. Full abduction stretches both anterior and posterior folds of the axilla, and there is upward movement of the skin covering the lateral aspect of the trunk. Treating axillary contractures should replace these gliding possibilities (12). In this study 20 cases operated by parascapular flaps 10 of them due post RTA

crushing of axilla and other 10 post scar release of burn injury all having severe degree contracture almost obliterating the axillae. Fasciocutaneous flaps from the back such as scapular and parascapular flaps have been used for treatment of obliterated axilla. They have proved to be excellent for resurfacing large defects involving the axilla, and their donor sites can be closed primarily up to a 10cm flap width (13).

When used as vascularized flap for axillary reconstruction, the risk of contracture or recurrence follow skin grafting in this region are avoided, postoperative splinting unnecessary, early shoulder mobilization is unimpeded and the period essential for rehabilitation is diminished. Parascapular flap as single stage alternative is excellent for resurfacing large defects involving the posterior axillary web or after total axillary obliteration (14, 15).

In our study the maximum dimentions of our flaps were 24 x 8 cm. So in all cases primary closure of the donor sites were done.

Fasciocutaneous flap: The flap of choice to cover the defect after release of the axilla if the width of the defect was less than 8 cm provided that the scapular and parascapular areas were not scarred. Donor site was closed directly after proper undermining (16). With the introduction of fasciocutaneous flaps by Ponten (17). There are now a number of larger flaps available around the

axilla which allows closure of total axillary defects. Fasciocutaneous flaps are usually considered for type 3 axilla contracture. Parascapular flaps are the most commonly used (16, 17).

If the axilla been totally obliterated or predominantly has a posterior fold contracture the parascapular flap could be primary initial consideration any way (2).

In our study all donor sites closed primarily and this like same studies by Roll C, Prantl L, Feser D et al., 2007 (18).

In our study all flaps were survived and due to bulkiness we aimed at flap reduction at a later time. In a study done by Rei O, Hiko H, et al., 2003 to reconstruct 124 axilla using skin grafts and various flaps over 25 years. There were no complication in 23 cases managed by regional flaps except one case which managed by latissimus dorsi was complicated by distal flap necrosis. The regional flap, free flap and scar flap all present a problem of bulkiness. Flap bulkiness limits upper limb adduction and can be aesthetically unsatisfactory. If lipectomy cannot be performed in the primary operation, secondary liposuction should be carried out (19).

In our study there were no complications regarding the 20 parascapular flaps and this similar to study done by Mofikoya BO and Oyenyin JO, 2007 in which all wounds were healed without complications and they achieved improvement in motion ranged from 90 degrees after 4 weeks to 120 degrees after 12 weeks (20). However in a study done by Shalaby H.A, 1995 for reconstructing 12 patients with grade 4 post burn axillary contracture by parascapular flaps he achieved total flap survival, good functional result but all his donor sites could not be closed primarily as 3 of them needs SSSG and also only one patient was not satisfied with her back scar (21).

CONCLUSION

In reconstruction of severe axillary contractures the parascapular flap is the best option for reconstruction with its reliable blood supply, large coverage area, and low donor-site morbidity to provide the desirable functional and esthetic outcome.

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