ORIGINAL RESEARCH PAPER

Plastic Surgery

POSTBURN CONTRACTURE OF DORSUM OF FOOT RELEASED AND RESURFACED BY FREE ANTEROLATERAL THIGH FLAP

KEY WORDS: foot, contracture, burn, free flap

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ABSTRACT

The foot and ankle scar post burn contractures are the result of deep partial and full-thickness burns that affect foot motion, impair the lower extremity function and benefit from surgical reconstruction. In children this is very disgressing as this leads to severe skeletal deformities as they grow. Coverage of these defects poses a great chanllenge as skin grafts may lead to recontracture if strict post operative regime is not followed and there are no local flaps available to cover such a huge defects. In our case a 7 year old patient presented with severe forefoot contracture for which we have done a wide release and excision of the hypertrophic scar and resurfaced it by a free anterolateral thigh flap.

INTRODUCTION:

The foot and the ankle joint represent 5 to 7% of all post burn deformities[1]. Severe forefoot deformities following burn cause musculoskeletal discomfort, restricted range of motion, disturbance in walking and wearing a shoe, contact ulcers, secondary inflammation hypertrophic scar and keloids. Functional disturbances in joint areas such as the ankle may affect posture and gait and lead to distortion of the pelvis and spinal curvature[2]. Severe forefoot deformities in children can aggravate skeletal deformities as they grow. Therefore, timely aggressive treatment is required for pediatric patients[3]. The basic principle for the treatment of severe forefoot deformity is wide release and en bloc resection. Reconstruction options are largely divided into skin grafts, local flaps and free flaps. However, skin grafts and local flaps provide limited soft tissue, making the reconstruction challenging in many cases. Free flaps provide extensive soft tissue coverage and are advantageous compared to other flaps in the reconstruction of the foot[4].

There are few cases reported in literature using skin grafts, local flaps for small defects and free flaps.

The goals of surgical reconstruction were to improve the functional capacity of patient in terms of improvements in ankle and foot movements and to improve the aesthetic appearance of the patient in terms of ankle and foot contour.

CASE HISTORY:

A 7 year old girl presented to us with severe forefoot contracture following thermal burn injury. She had sustained accidental thermal burn injury at home 1 year back. She had undergone preliminary medical treatment and dressing in the local hospital. No proper splintage was given at that time. She came from a low socioeconomic background. On examination there was a wide broad contracture band on dorsum of left foot extending from the base of the toes upto the lower leg involving ankle joint with hypertrophic scar over ankle joint and hypopigmented patch on dorsomedial aspect of foot (figure 1).

FIGURE 1

Investigations were done for anaesthesia fitness, digital X-ray of left foot was done to rule out any bony abnormality. There was no bony deformity on X ray examination.

Procedure: First the release of the contracture was done under tourniquet by excision of hypertrophic scar and band followed by the K-wire insertion on great toe,2nd ,4th,5th toe to provide stability. There was tendon shortening, release and z plasty of the extensor halluces longus and extensor digitorum longus tendons was done. Joint reconstruction was not attempted.

The resultant defect was about 15 x 8cm in size (figure 2).

FIGURE 2

Then the recipient bed was prepared by exposing the anterior tibial artery and bringing the great saphenous vein near to artery (figure 3).

FIGURE 3

Preoperatively, perforators were identified with a hand held Doppler probe (figure 4).


FIGURE 4

Then the anterolateral thigh free flap was harvested from right thigh of size 15 X 8 cm size (figure 5).

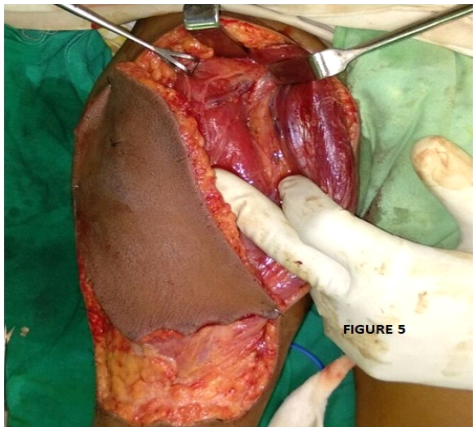
FIGURE 5

The dominant vessel supplying the flap were the perforators from the descending branch of lateral circumflex femoral vessels. The flap was taken to the defect area and microsurgical anastomosis of the vessels was done using of 9-0 prolene under microscope magnification. Flap insetting was performed and a suction drain was given (figure 6).


FIGURE 6

Split thickness skin graft used for secondary defect (figure 7).


FIGURE 7

The flap was healthy and showed no signs of necrosis. Graft take in the donor site was satisfactory. The patient was discharged on the 14th post operative day. She was prescribed silicon gel sheets and pressure garments for regular use to reduce the hypertrophic scar at the suture site. Two month follow up result was satisfactory. K-wire was removed after two months (figure 8).


FIGURE 8

On 6 months follow up the patient was able to work easily without any assistance. The donor area was treated with pressure garments and coconut oil massage. The patient as well as the parents were well satisfied with the cosmesis and functional outcome (figure 9).


FIGURE 9

DISCUSSION:

Advantages of treating severe forefoot deformity using ALT flaps5

- ALT has a long pedicle which can be connected to suitable recipient vessels outside the scar
- ALT flaps have extensive soft tissue for the reconstruction of joints such as the ankle
- ALT flaps allow sufficient soft tissue coverage after eliminating postburn scar contractures, preventing the recurrence of skin contractures
- ALT flaps are useful for reconstruction of the extensor tendon after removing scars with the help of the tensor fascia lata
- The use of ALT flap allows simultaneous flap harvest and recipient site preparation, thus reducing operating time and enabling the patient to rest in a supine position during the procedure.
- The color and texture of the ALT flap are optimal for lower extremity reconstructions.
- As the donor scar is in the unexposed area, its location permits easy concealment with minimal clothing

There occurs no scarring of the surrounding skin in case of free ALT flap which is a disadvantage in case of local flaps

- The disadvantage of using an ALT flap for dorsum of foot contracture is the bulkiness of the flap. This can be dealt with by taking a thin flap. Flap thinning can be performed after flap elevation and before transection of the vascular pedicle. The pedicle entrance into the skin is marked. Preservation of at

least a 2 cm radius of tissue around the pedicle is recommended to insure adequate perfusion of the flap. If a thick and bulky flap has been taken debulking can be done after 6 months to achieve good flap contour.

- This case is unique as there was severe forefoot contracture in a child which needed correction at the earliest to prevent any further contracture and deformity at a later stage. Using free ALT flap prevented any further scarring of the local tissues in a young girl child.
- The functional and aesthetic outcomes were subjective according to the patient's and her parents satisfaction.
- To conclude ALT flaps may be considered ideal for the treatment of severe forefoot deformity that causes pain and inconvenience during the performance of activities

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