Autologous Smashed Dermal Graft with Epidermal Re-closure: Modified Technique for Acne Scars

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ABSTRACT

Conventional technique of dermal grafting for acne scars where the source of filler material used is the patient's own dermis requires longer surgical time, recovery period and can result in unsightly scars at the donor area. Hence, it is not suitable for treating a larger number of scars. Furthermore, these dermal grafts are firm and cannot be contoured to fit all types of acne scars. Occurrence of epidermal cyst and secondary infection is another complication if epidermis is not completely removed. Enzymatic techniques need trypsinisation which is expensive and requires laboratory facilities.

KEYWORDS: Acne scars, box scars, rolling scars, smashed dermal graft, subcision

Innovation: Smashed dermal grafting technique with re-closure of the donor area with epidermis addresses some of these issues.

INTRODUCTION

Dermal grafts, autologous fat and injectable fillers have been used to correct deeper contour defects.[1,2] Various treatment modalities alone or in combination have been tried for acne scars, which include dermabrasion, excisional surgery with closure, punch grafting and elevation, collagen implants, silicone injections, chemical peeling and laser abrasion.[3] More than one type of acne scars such as box scar, rolling scar and ice pick scars can be present at a given point of time in an individual. Hence, all these need to be addressed while treating a patient. Conventional technique of dermal grafting for acne scars involves implantation of appropriately dissected deep dermis into the corresponding recipient areas.[2] Enzymatic techniques were introduced to overcome some of the disadvantages of conventional method by which dermis was made soft, flexible and easily mouldable.[4] Survival rates of dermal grafts are much higher than fat transplants and are almost permanent. Results achieved can be gratifying.[5]

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TECHNIQUE

Equipment needed

The following equipments are needed: graft holding forceps, razor blade holding dermatome, biopsy punches (2 mm), wooden spatula, 15 number surgical blade and Bard-Parker handle, artery, iris scissor, Petri dishes, disposable syringes of 1 ml (tuberculin) and 2 ml and 18-gauge needle.

Patients are ideally taken up after subcision[6] done 2 weeks before the dermal grafting. This helps in creating dermal pockets and will be easy for the implantation of dermal grafts.

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Step 1: Harvesting dermal graft

Donor site is anaesthetised using topical anaesthesia; a mixture of lidocaine 25 mg and prilocaine 25 mg is applied after surgical cleaning, under occlusion, for 1 h. Ultra split-thickness graft is harvested from the antero-lateral aspect of the thigh using razor blade holding dermatome. Epidermal ultra split-thickness graft harvested is left intact at the advancing edge [Figure 1]. It is secured in gauge soaked in normal saline [Figure 2].

Dermal tissue is harvested by punches of size 2 mm [Figure 3]. Care should be taken to avoid the hair follicles while harvesting the graft. Excess fat should be trimmed, and dermal grafts are transferred to Petri dish containing normal saline [Figure 4].

Step 2: Closing the donor site with epidermal sheet which acts as biological dressing

To ensure easy flow of serum from donor area, multiple nicks are made using 18-gauge needle on the epidermal sheet which is secured at the advanced end in normal saline gauze [Figure 5]. Donor area is closed back with this sheet of epidermis which is spread uniformly and fixed with cyanoacrylate glue which acts as biological dressing [Figure 6]. Advantage of ultra split-thickness graft is that due to lack of dermal tissue, there is no curling of epidermis and hence it is easy to spread. Firm compression is applied over the graft to prevent haematoma or seroma [Figure 7]. Secondary dressing is done with paraffin gauze [Figure 8]. Dressing is removed on the 8th day.

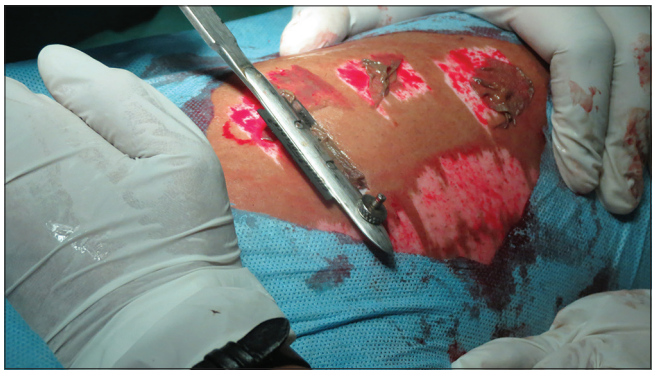

Figure 1: Epidermis harvested (ultra split-thickness graft) is left intact at the advancing edge

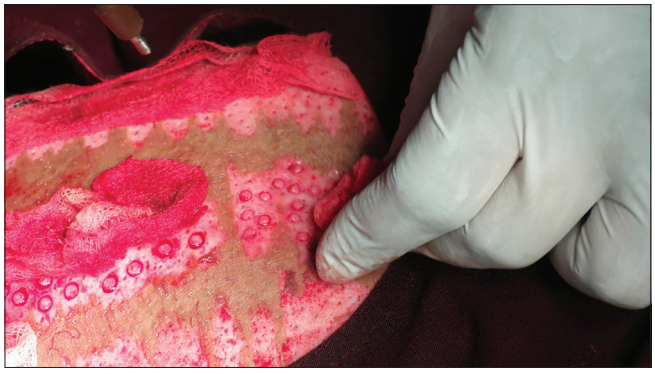

Figure 3: Dermal tissue is harvested by punches of size 2 mm

Step 3: Preparing the dermal graft

Dermal grafts are placed on a sterile wooden spatula. These grafts are held with graft holding forceps in one hand and are minced with 15 number surgical blade to form smashed dermal grafts with the other hand [Figure 9]. This step can also be performed using curved iris scissors. These grafts thus obtained are mouldable to any shape and are suitable for box scar, rolling scar and linear and irregular geometrical scars.

Step 4: Inserting the dermal graft

Smashed dermal graft is aspirated into 1 ml tuberculin syringe with 18-gauge needle attached to it [Figure 10]. It is injected into the dermal pockets beneath the scars [Figure 11]. Smashed dermal grafts can also be inserted with graft holding forceps. External manipulation can then be performed till maximum correction is achieved.

Follow-up

The patients are advised to be in rest for 8 days. Mild haematoma and inflammatory changes may be noticed

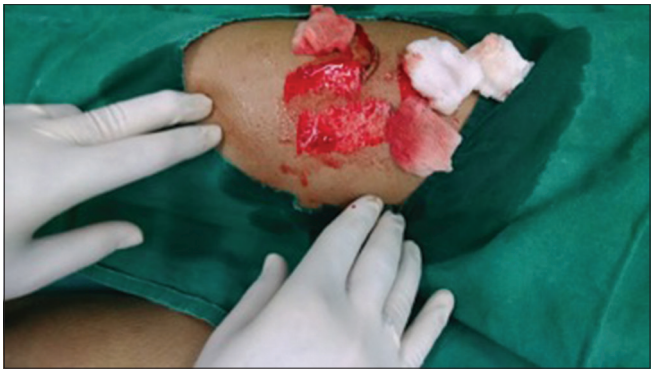

Figure 2: Epidermis is secured in gauge soaked in saline

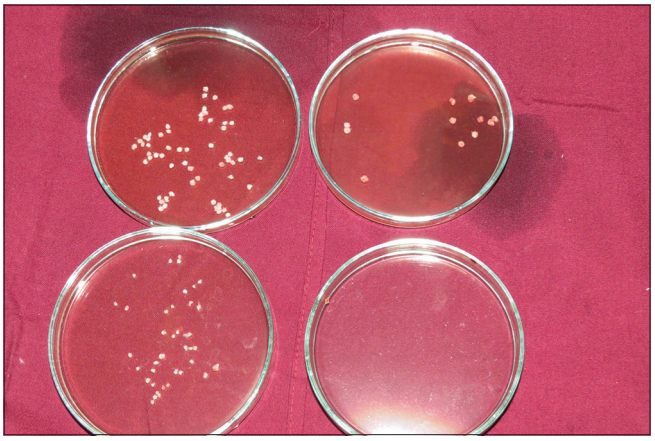

Figure 4: Dermal grafts are transferred to Petri dish containing normal saline

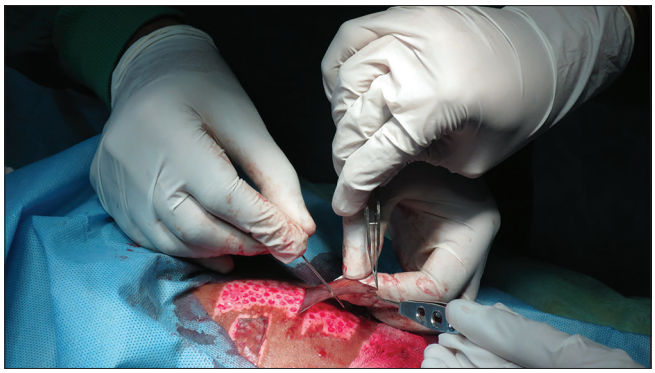

Figure 5: Multiple nicks are made using 18-gauge needle on the epidermal sheet

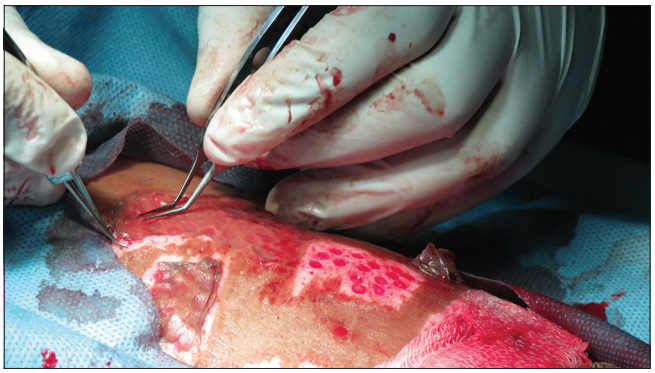

Figure 6: Donor area is closed back with the epidermis and secured

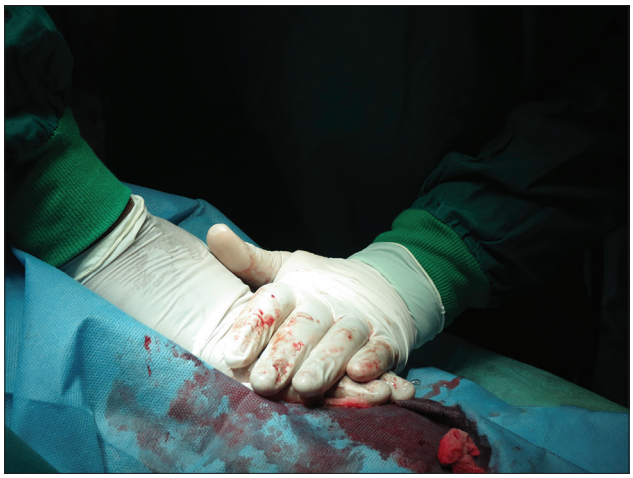

Figure 7: Firm compression is applied over the graft

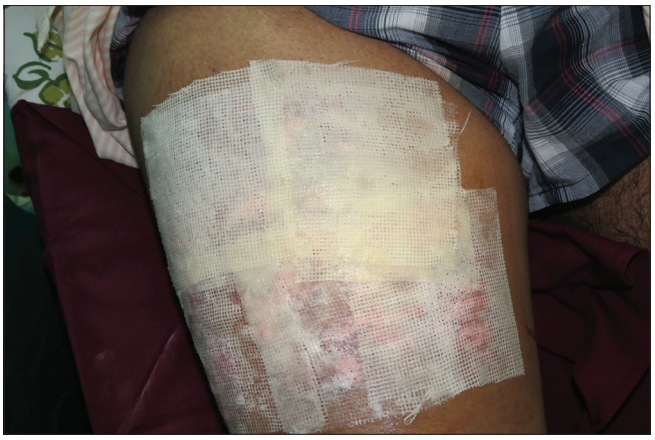

Figure 8: Secondary dressing done with paraffin gauze

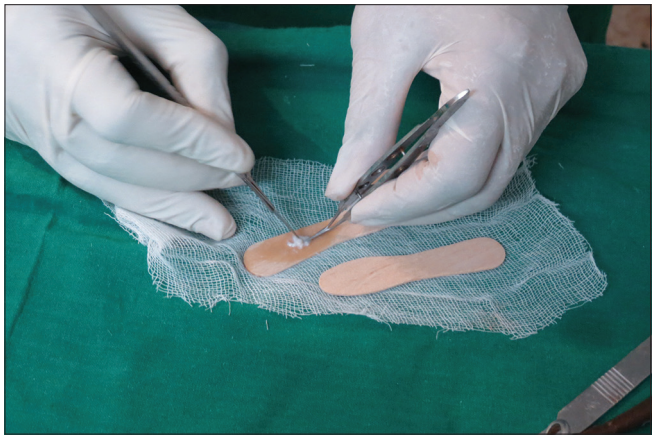

Figure 9: Grafts are minced with a 15 number surgical blade

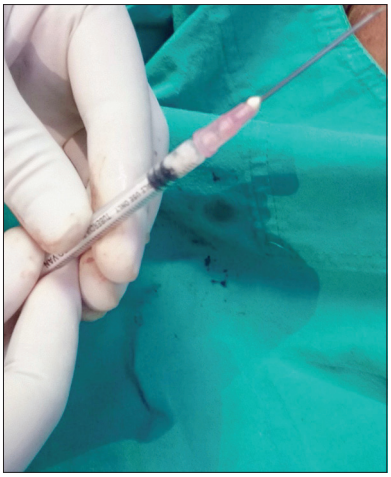

Figure 10: Smashed dermal grafts are aspirated into 1 ml syringe with 18-gauge needle attached to it

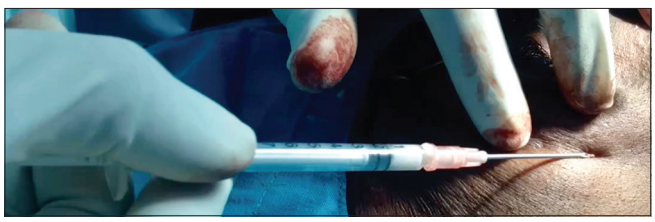

Figure 11: Injecting dermal graft

at the recipient site and they are the only immediate complication which will last for 1 week. Dressing at donor site is removed after 8 days.

Advantages of smashed dermal graft over conventional/enzymatic techniques

Smashed dermal graft is soft and easily mouldable to any shape, thus can be accurately tailored for all

types of acne scars; surgical time is reduced by three times; the epidermis acts as a marvellous biological dressing material, minimizing the chances of infection and reducing recovery time; minimizes the scarring at donor area resulting in good cosmetic appearance [Figures 12 and 13]; increases patient's as well as dermatosurgeon's comfort and hence can be a preferred method when larger areas have to be corrected. Finally, it is cost-effective and easy to perform. Maximum follow up period was 12 months. Before and after result photographs of a patient are shown in Figures 14-17.

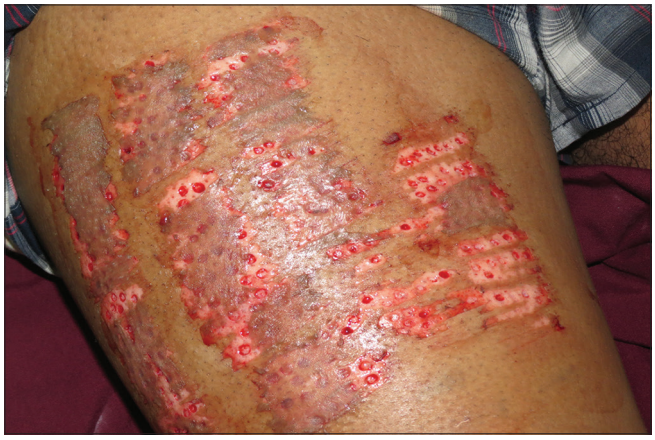

Figure 12: Donor area on day 1 before dressing

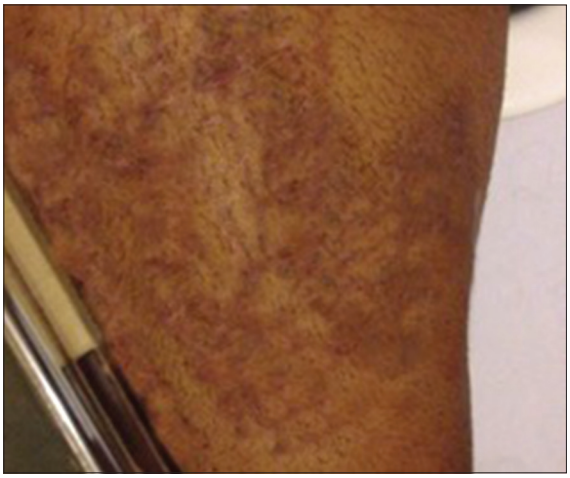

Figure 13: Donor area after 3 months

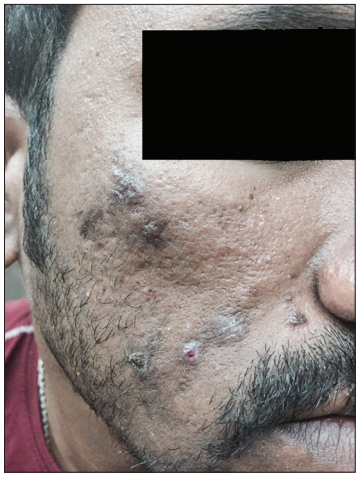

Figure 14: Baseline-The right cheek

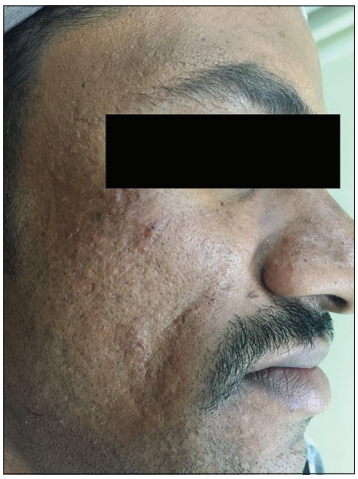

Figure 15: After 12 months-The right cheek

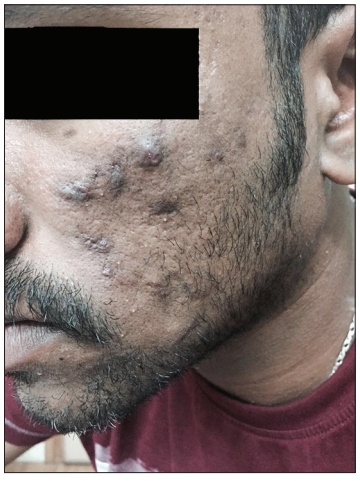

Figure 16: Baseline-The left cheek

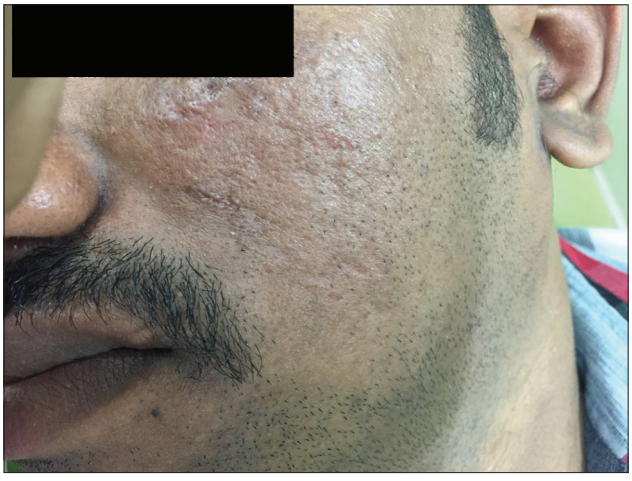

Figure 17: After 12 months- The left cheek

Future scope for smashed dermal grafts

In our experience, we have found it to be suitable for chickenpox scars, linear scars, replacing filler in nasolabial correction and in inactive en coup de sabre.

CONCLUSION

This modified dermal grafting technique, which combines ultra split-thickness grafting and smashed dermal grafting, results in good improvement of the acne scars and also improves the cosmetic appearance at the donor area.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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