

GLABROUS SKIN GRAFT FOR PALMER SKIN DEFECTS; SIMPLE BUT USEFUL PROCEDURE

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ABSTRACT

Objective: To assess the usefulness of glabrous skin graft in covering palmer defects.

Study Design: Descriptive case series.

Place and Duration of Study: Study was conducted at Combined Military Hospital Rawalpindi from January 2013 to June 2016.

Material and Methods: Seventy patients of both sexes with hand defects secondary to trauma, burn or surgery who underwent coverage with glabrous skin were included in the study. None of these wounds had any exposed vital structure. Patients were operated and reviewed by the same team. Skin graft was harvested from the hypothenar eminence using simple surgical blade. Age, sex and outcome was recorded and data were evaluated.

Results: Out of 70 cases 53 (75.71%) had a good graft uptake, 14 (20%) had partial graft loss while 3 (4.28%) had complete loss of graft. None of the healed grafts had hyperkeratosis or contracture. Major advantages were found out to be good colour and texture match. All of our patients with healed grafts were satisfied with the functional and cosmetic outcome. All of the donor sites healed well and required no intervention.

Conclusion: Coverage of small palmer wounds with glabrous skin grafts had shown excellent cosmetic and functional outcome along with minimal donor site morbidity and easy technique.

Keywords: Glabrous skin graft, Hand wound.

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INTRODUCTION

Advancement in science and technology has increased the incidences of injuries. Hands and feet being the most functionally active and exposed parts of the body are always liable to get injured. Daily surgeons come across numerous patients with small soft tissue defects on palm and sole. Despite being minute and having no vital structure exposed these are a source of great discomfort for the patients. These wounds not only affect the patients functionally and psychologically but also financially. Keeping in view the burden these injuries have on the health system, it remains a therapeutic challenge for the surgeons to manage them in the best possible way¹.

Different methods have been devised to manage these wounds. The goal had always been a quick and sound recovery. Autologous skin

grafting remains one of the best and time tested remedy². Skin grafts can be harvested from different parts of the body like thighs, arms, groin, scalp, palm and sole etc³. One of the major concerns of skin grafting remains poor color match in the recipient site and donor site morbidity⁴.

The glabrous skin of the palm and sole has special traits which distinguishes it aesthetically and functionally from skin of rest of the body⁵. When area with glabrous skin is grafted with non glabrous skin it results in poor color and texture match, unsightly donor site scar, contractures, hypertrophy, sub graft fibrosis, painful hyperkeratosis buildup in periphery of graft^{6,7}. These complications remain a source of agony and mental stress for the patients leading to recurrent visits to plastic surgeons and some ending up in multiple surgeries.

Following famous maxim of Harold Gillies "replacing like with like"⁸, glabrous skin should be replaced with glabrous skin. Palm and sole remain the exclusive source of glabrous skin.

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Recent studies have demonstrated the advantages of covering these defects with glabrous skin harvested from palm and instep of sole. These advantages include better color and texture match, better functional recovery, lesser incidence of contractures and pigmentation, more durability and resilience to trauma, lesser donor site morbidity and better patient satisfaction^{9,10}. Despite these advantages, nonglabrous skin is mostly used to cover these small wounds on palm in most of the centers, and people are reluctant to shift from this trend.

The purpose of conducting this study was to share our experience with glabrous graft, and to highlight the advantages of using it to cover small to medium sized defects on palm.

MATERIAL AND METHODS

This descriptive study was conducted at the department of plastic and reconstructive surgery CMH Rawalpindi from January 2013 to June 2016. Clearance for study was taken from hospital ethical committee. Total 70 patients were included in our study. Patients were selected using purposive sampling technique. Patients of both sexes with small palm wounds due to trauma, burn or surgery were included in this study. Patients having age less than 5 years and greater than 80 years of age, uncontrolled diabetes, large wounds and severe crush injuries with exposed vital structures were excluded from our study. Post operatively patients were

Standard Deviation were calculated for quantitative variables. Categorical variables were expressed as frequency and percentage.

Operative Technique

Surgery was performed both in local or general anesthesia depending on the age of the patient and the cause of wound. Split thickness glabrous skin graft was harvested either from the hypothenar eminence or the instep of the sole. The donor site was infiltrated with 1% lignocaine with adrenaline to decrease the bleeding and to give a more rigid area for harvesting. Graft was harvested using surgical blade mounted on a bard parker handle. The graft included the stratum corneum and part of white glistening dermis. Graft was anchored with vicryl 5/0 stitches. Decision regarding splinting of grafted area was made depending on the requirement. Paraffin dressing was used as first layer followed by sterilized saline soaked surgical gauze, cotton and crepe bandage. Tie over dressings were used where required. Donor site was dressed in the same way. First dressing was changed on 7th day but in cases where infection was suspected dressing was changed earlier. Donor site dressing was changed at least after 2 weeks.

RESULTS

Total 70 patients were included in the study, 52 (74.2%) were males and 18 (25.7%) were females. Mean age of patients was 32.7 ± 14.4 years, with a range of 6-79 years (table). All of the

Table: Age and sex distribution.

Age ranges	Total	Male	Female
Less than 10	4 (5.7%)	4 (7.6%)	0
11-20 year	8 (11.4%)	6 (11.5%)	2 (11.1%)
21-30 year	20 (28.5%)	15 (28.8%)	5 (27.7%)
31-40 year	19 (27.1%)	13 (25%)	6 (33.3%)
41-50 year	11 (15.7%)	7 (13.4%)	4 (22.2%)
51-60 year	5 (7.1%)	4 (7.6%)	1 (5.5%)
More than 60	3 (4.2%)	2 (3.8%)	0
Total	70	52 (74.2%)	18 (25.7%)

followed up by the same surgical team. Patients age, sex, complications were recorded and data were evaluated using SPSS 20. Mean and

patients had small wounds on the hand without exposure of vital structures. Main etiology was found to be trauma 54 (77.14%) followed by burn

12 (17.14%) and post surgery 4 (5.71%). In 41 (58.57%) left hand was involved while in 29 (41.42%) right hand was involved. Of these cases 53 (75.71%) had a good graft uptake, 14 (20%) had partial graft losses while 3 (4.28%) had complete losses of graft. These graft losses were primarily due to wound infection and shearing forces either due to non compliance of the patient or inadequate splinting of the grafted area. All of healed grafts had a good color and texture match

DISCUSSION

The skin being the largest organ of the body has different characters in different regions. Palm of the hand and sole of the foot have specialized glabrous skin while rest of the body mostly consists of non glabrous skin. Glabrous and non glabrous skin is different histologically. Glabrous skin has thicker epidermal layer with well defined stratum lucidum and corneum. Its connective tissue in dermis is less elastic and

Figure: Operative results.

<p>Patient-I</p>	 <p>Defect on index finger</p>	 <p>Intraoperative showing donor site</p>	 <p>Early results at 7th day showing good uptake</p>
<p>Patient-II</p>	 <p>Defect on index finger</p>	 <p>Intraoperative showing the donor site</p>	 <p>Results at 4 weeks showing Good color match</p>
<p>Patient-III</p>	 <p>Defect on palm</p>	 <p>Early results at 7th day showing good uptake</p>	 <p>Results at 4th week showing Good color match</p>

and none of our patients had complaints regarding hyper or hypo pigmentation. None of the healed grafts had hyperkeratosis or contracture. All of our patients with healed grafts were satisfied with the functional and cosmetic outcome (figure). We had no mortality in our study group. All of the donor sites healed well and required no intervention.

more compact. It lacks sebaceous glands and is hairless. All of these characters make the glabrous skin more resilient⁵.

Skin grafting remains one the most important and basic modality for wound coverage. It was first mentioned in ancient texts from Indian subcontinent written by the tile

making caste¹¹. After that a long time elapsed till Sir Astley Cooper used the skin from amputated thumb to cover the stump in 1817. Later on Jacques-Louis Reverdin reported "Pinch Grafts" in 1869. As research and science progressed Carl Thiersch perfected the art of grafting in 1886 when he described split thickness skin graft¹².

Legbo et al conducted a study in 51 wounds with a mean age of 11.4 years and an age range of 4 months to 26 years¹³. In another study the mean age was 2.05 years with a range of 6 months to 6.5 years¹⁴. The maximum number of patients in our study was from the age group of 20-40 years making 55.6% of our study. While in another study conducted on patients of post burn contracture 72% patients were found to be in the age group of 1-10 years¹⁴. This major difference in the ages is due to the fact that the patients in our study mostly consisted of patients of all age groups with traumatic granulating wounds, while other studies consisted of a large proportion of pediatric patients with post burn contracture release. Another interesting fact that can be scouted up from this data is that major proportion of patients both male and female who get hand injuries fall in 20-40 years age group. The major reason for this being that the population in our study consisted mostly of military men and their families who are usually involved in heavy work at job and at home and are prone to these injuries. In our study male patients dominated as 52 (74.2%) patients in our study were males and only 18 (25.7%) were females. In study by Legbo et al the major proportion of patients was females (85%)¹⁴. In another study conducted in Pakistan 66% of patients were male¹⁵. This male predominance in local studies can be clarified by the fact that males being the sole earning hands in our part of the world are more inclined to taking hospital treatment as effects their daily activities and earning.

Major complication in our study was graft loss. In our study 53 (75.71%) had a good graft uptake, 14 (20%) had partial graft loss while 3 (4.28%) had complete loss of graft. These

percentages were near the percentage of other studies. One study had 86.3% good graft uptake and 13.7% partial uptake¹⁴. While another study Maker and iteld had no loss of graft, but his study was on fresh wounds and on sole¹⁶. In our study graft loss was primarily due to wound infection and due to shearing forces. Most of the graft loss was in chronic wounds and the wounds which were crossing joint surfaces and were not properly splinted. We recommend that wounds which cross the joints should be properly immobilized either by using splints or Kirschner wires.

All of our healed grafts fared well as none of them developed marginal hyperkeratosis for which non glabrous skin grafts are notorious and we had no incidence of graft contracture or subdermal fibrosis. These findings matched other studies conducted by Nakamura et al⁹ and Wu et al⁵. These complications especially contracture should be avoided in digits as it severely affect the function of the hand. It is a well documented fact that the graft can affect the myofibroblast population in a wound depending on the thickness of the dermis in the graft¹⁷. We avoided these complications by using thick split thickness skin grafts.

One of the major problems with skin grafting is the hyper pigmentation of the graft. This problem is especially more conspicuous whenever non glabrous skin graft is used. Patients, especially young girls keep visiting clinics to get rid of these unsightly patches due to the social stigma it carries in our society. In our study all of the healed grafts matched well to the surrounding skin and we achieved a good cosmetic and functional outcome. We found similar findings in studies by Wu et al⁵ and Song et al¹⁰. This success is attributed to the fact that glabrous skin has the same texture, color and composition. So it integrates well and is more durable, functionally compliant and aesthetically pleasing. Keeping in view the importance of donor site, all of our donor sites healed well and none of them required any additional procedure.

Same results were shown by Milner et al⁶ and Simman¹⁸.

CONCLUSION

Coverage of palmer wounds with glabrous skin grafts is a simple and ideal procedure in terms of its excellent cosmetic and functional outcome along with minimal donor site morbidity and easy technique.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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