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ORIGINAL RESEARCH

A Study of Graft Recipient Site Based on Patient and Observer Scar Assessment Scale (POSAS): An Observational Study

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Abstract:
Background: A completely matured skin grafted site can always be distinguished from the surrounding normal/ scarred skin. Even an excellently applied and matured graft is also a 'scar' in the eyes of the patient. A number of scales have been developed to assess the quality of post-operative scars which can range from almost invisible to immensely unaesthetic. However, the aesthetic aspects of skin grafts in the long run have not been studied. VSS is one of the most recognized scar assessment scales and has been widely used in literature for outcome measures. In presentstudy the patient and observer scar assessment scale (POSAS) were used to assess the graft recipient site in the long run.
Objectives: To study the Graft Recipient Site Based on the Patient and Observer Scar Assessment Scale (POSAS).
Material and Methods: This cross-sectional observational study conducted in the Department of Burns and Plastic Surgery, Lok Nayak Hospital and associated Maulana Azad Medical College, New Delhi among the patients who had undergone split thickness skin grafts for various indications more than five years ago. The total duration of the study was 12 months. After taking informed consent, objective findings on clinical examination were recorded in the proforma. Proforma includes the POSAS scale. Hypertrophy was accurately measured using Castroviejo calipers.
Results: The increased distance of two-point discrimination as compared to normal was from 1.25 times (minimum) to 2.33 times (maximum). In thirty-one patients it was equal in the two areas. The POSAS score of the patients ranged from 11 to 31 with a mean score of 18. The POSAS score ranges from 11 (best or normal) to 110 (worst). This shows that in the long-term split skin grafts give very good results and are reasonably well acceptable to the patients.
Conclusion: There is a good amount of sensory recovery in the split skin graft in most of the patients and initial hyperpigmentation of the split skin graft also resolves to a large extent.
Keywords: Graft Recipient Site, Patient and Observer Scar Assessment Scale, Hypertrophy

INTRODUCTION

Tissue transplantation is the essence of reconstructive plastic surgery.Once the graft has been harvested from any suitable and appropriate donor site, it is placed over the recipient site devoid of skin and immobilized by any one or more of surgical techniques.[1,2] Permanent survival of this skin graft requires its revascularization at the recipient site, leading to what is known as 'take' of the graft.[3] If revascularization does not occur, the graft dies. Classically, this 'take' of the skin graft occurs in three phases starting from (i) the phase of plasmatic imbibition for the first 24-48 hours followed by (ii) a phase of inosculation by the end of 48 hours and up to day 4 and (iii) The establishment of circulation and revascularization which occurs by 7th day in the third phase of graft 'take'. These phases overlap with each other.

Although the stage of graft maturation is a natural phenomenon, various therapeutic measures have been taken by reconstructive surgeons over a period of time so as to have a favorable outcome.[4] At the end of this stage when the graft is fully mature, the measures taken are no more effective and required and the patient is usually discharged from following any

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particular regime. This finally matured graft is ideally supposed to be soft and supple, stable, mobile over the recipient bed, pinchable, non-hyperemic/ congested, without any wrinkles or hypertrophy, with none or minimal mismatch in pigmentation and without any tendency of showing any ulcerations, infection or dermatitis.

A completely matured skin grafted site can always be distinguished from the surrounding normal/ scarred skin. Even an excellently applied and matured graft is also a 'scar' in the eyes of the patient.[4]A number of scales have been developed to assess the quality of post-operative scars which can range from almost invisible to immensely unaesthetic. However, the aesthetic aspects of skin grafts in the long run have not been studied. VSS is one of the most recognized scar assessment scales and has been widely used in literature for outcome measure.[5,6] In present study the Patient and Observer Scar Assessment Scale (POSAS)[7] was used to assess the graft recipient site in the long run.

Objectives: To study the Graft Recipient Site Based on the Patient and Observer Scar Assessment Scale (POSAS)

MATERIALS AND METHODS

This cross-sectional observational study was a part of another study conducted in the Department of Burns and Plastic Surgery, Lok Nayak Hospital and associated Maulana Azad Medical College, New Delhi among the patients who had undergone split-thickness skin grafts for various indications more than five years ago. The total duration of the study was 12 months.

Due to the limited time duration allotted to the study and the number of individuals fulfilling the inclusion criteria visiting the hospital, the sample size in this study was taken as 50.

Patients of both genders between 18 and 45 years of age and those who had split thickness skin grafting done on surgically created raw areas at least 5 years back presenting in OPD of the Department of Burns and Plastic Surgery, Lok Nayak Hospital, New Delhi were included in the study and patients who had skin grafts applied to granulating wounds or with surrounding scarring were excluded from the study.

After taking informed consent, a proforma of particulars of the patients was filled. A questionnaire of detailed history and present subjective symptoms and objective findings on clinical examination was recorded in the proforma. Photograph of the grafted site of all patients was taken at the time of the patient's visit to the OPD of the department. Proforma includes the POSAS[7] scale. Hypertrophy was accurately measured using Castroviejo calipers. Skin pliability was subjectively assessed by palpation. The hyperpigmentation or hypopigmentation was assessed as it was compared with surrounding normal skin. The scar assessment scale namely POSAS was used to calculate scores at the time of the visit and was analyzed at end of the study. The best possible POSAS score is 11 while the worst possible score is 110.

The collected data was entered into a MS-Excel sheet and was statistically evaluated using SPSS v25.The qualitative data was expressed by the percentages.

Ethical Committee Approval: The study protocol was presented to the Institutional Ethics Committee (IEC), Maulana Azad Medical College, New Delhi and its approval was obtained vide letter number F.1/IEC/ MAMC/DNB/ [81/09/2020/No.286] dated 07-12-2020.

RESULTS

Table 1 shows the increased distance (in mm) of two-point discrimination in 22 patients. The increased distance of two-point discrimination as compared to normal was from 1.25 times (minimum) to 2.33 times (maximum). In thirty-one patients it was equal in the two areas.

Table 2 shows the POSAS score of the study participants. POSAS score ranged from 11 to 31. Mean POSAS score was 18. The best possible POSAS score is 11 while the worst possible score is 110. (Table 2 and Figure 1)

Twenty-six patients (49%, N =53) were very satisfied, and twenty-five patients (47.2%) were satisfied with the outcome. Only two patients (3.8%) reported dissatisfaction.

Table 1: Two-point discrimination over recipient areas versus surrounding normal areas in patients with diminished sensation.

S no.	Two-point discrimination over grafted area (in mm)	Two-point discrimination over surrounding skin area (in mm)	Increased distance by a factor of ??times
1.	**30**	18	1.66
2.	**35**	26	1.34
3.	**40**	28	1.42
4.	**28**	18	1.55
5.	**70**	40	1.75
6.	**21**	15	1.40
7.	**12**	9	1.33
8.	**17**	8	2.12

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9.	**7**	3	2.33
10.	**15**	12	1.25
11.	**13**	8	1.62
12.	**15**	7	2.14
13.	**12**	9	1.33
14.	**50**	40	1.25
15.	**7**	5	1.40
16.	**24**	18	1.33
17.	**14**	7	2.00
18.	**30**	21	1.42
19.	**12**	9	1.33
20.	**40**	28	1.42
21.	**21**	15	1.40
22.	**50**	40	1.25

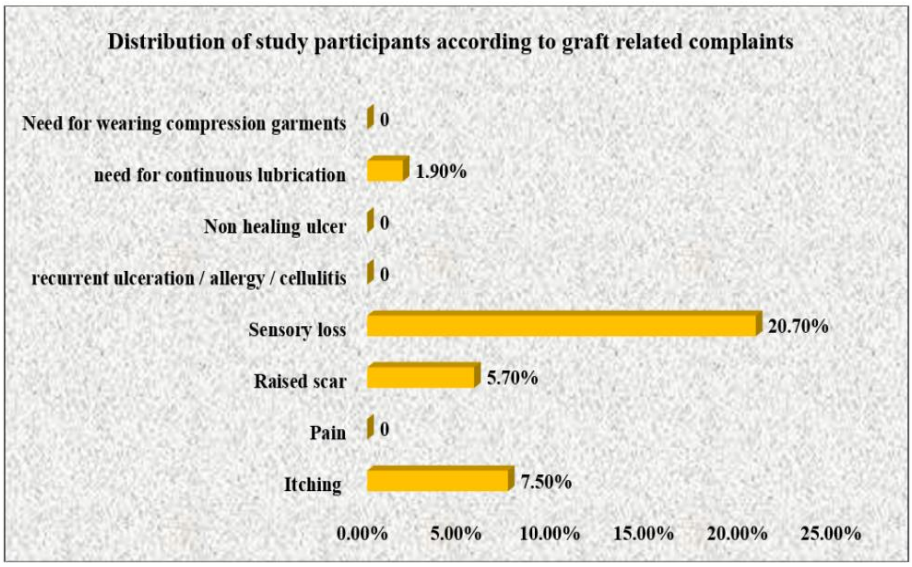

Figure 1: Distribution of study participants according to graft related complaints

Table 2: Distribution of POSAS score in study participants.

POSAS score	No. of patients (N=53)	Percentage
11	4	7.5
12	1	1.9
13	11	20.7
15	3	5.7
16	4	7.5
17	11	20.7
19	3	5.7
21	2	3.8
23	3	5.7
24	2	3.8
25	4	7.5
27	3	5.7
31	2	3.8
Total	**53**	**100**

Table 3: Distribution of study participants according to level of patient satisfaction as per history given.

Satisfaction of patient	Frequency (N=53)	Percentage (%)
Very satisfied	26	49
Satisfied	25	47.2
Unsatisfied	2	3.8
Total No. of patients.	**53**	**100**

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Fig 2: 45-year old male operated for Marjolijn's ulcer over the popliteal fossa and leg 7 years ago. The skin grafted area has good colour match with the surrounding skin with no junctional hypertrophy.

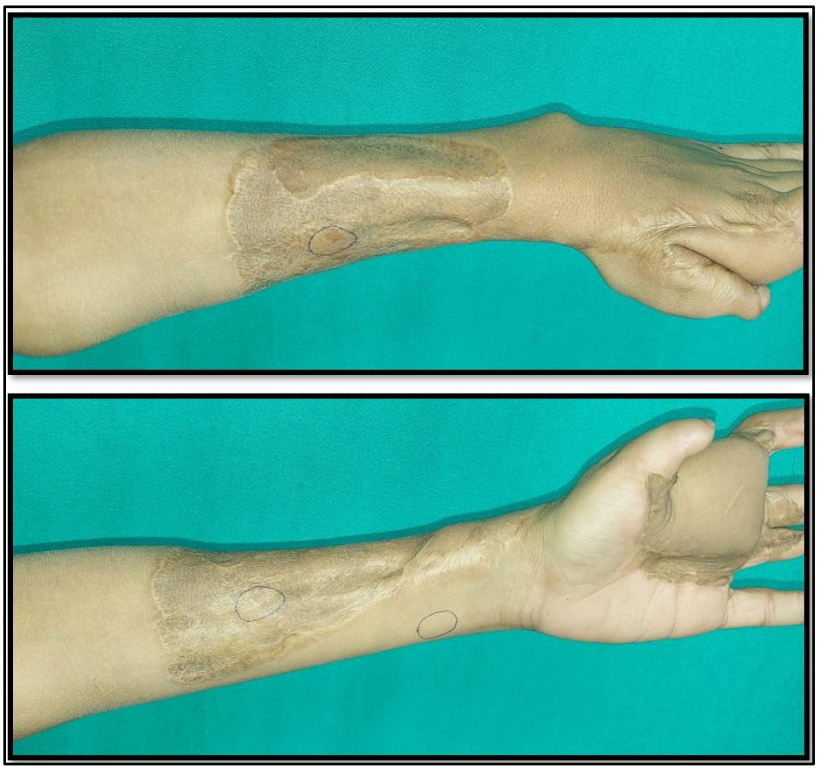

Fig 3: A 20-year female operated for post-electric burn contracture with release and radial artery forearm flap coverwith donor site over forearm skin grafted 6 years ago. No junctional hypertrophy. On clinical examination the graft was soft and supple. There was decreased sensation over the grafted area.

DISCUSSION

Many scales are available in the literature to assess the scar quality.[1,2,8,9] However, the split skin grafted areas have never been assessed using anyone or more of them. In 1990, Sullivan et al gave Vancouver Scar Scale (VSS) in their article 'Rating the burn scar'.[10] Although this scale is one of the most widely used scar assessment scale for burn patients, it lacked patient's subjective opinion about the result. Patient and Observer Scar Assessment Scale (POSAS) was published by Draaijers et al in 2004 taking patient's opinion as well.[7]

In our study, POSAS scale was used for scar assessment as it appears to be the most comprehensive and takes into account the important aspect of patient's perspective.[11] In POSAS, the observer component was composed of following six parameters: vascularity, pigmentation, thickness, relief, pliability and surface area. The patient components consisted of six parameters namely: scar related pain, itchiness, colour, stiffness, thickness and irregularity.POSAS score ranged from 11 to 31 (Mean= 18.1 ± 5.5) in the present study. The best possible POSAS score is 11 while the worst possible score is 110. Our results show that in the long-term split skin grafts give very good results and are very much acceptable to the patients.No study was found where POSAS score was applied to the split skin grafted areas.

Pruritis or itching is defined as an unpleasant sensation and desire to scratch a healing or freshly healed wound. It is one of the most disturbing physical complaints of the patient and it continues for several months to years and affects the quality of life

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of the patient.[12,13] The incidence of pruritis in post burn patients has been reported to vary from 80-100%. This symptom corelates strongly with the factors like healing time since injury and presence of hypertrophic scars apart from the treatment modalities advised by the surgeon. It adversely affects the quality of life due to sleep disturbances, anxiety and impairment of daily activities. The urge to scratch can lead to damage to the neo-epithelium leading to a vicious cycle of ulceration, infection, healing, itching and then again ulceration. A number of studies have been done to find the prevalence rates, severity of the itching and its treatment following burn.[14-16] However, the data with respect to split skin graft recipient sites on a short-term/long-term basis is nearly absent in literature. The available literature mostly concentrates on healed burnt areas. It has been observed that pruritic complaints commence very early in the stage of wound healing and their severity diminishes with time in most of the patients. A variety of substances e.g., histamine, acetylcholine, bradykinins etc., have been implicated in the generation of pruritic stimuli with receptors being present on sensory nerve fibers and skin cells.[12,13] Each selective unmyelinated C fiber transmits the pruritic sensation. Anti-histaminicshave been the mainstay of management for itching for several decades.[12,17] Apart from the massage with various oils and creams and pressure therapy using compression garments are also used to resolve the hypertrophic scars. Itching was reported by 4 patients in our study. Probably because our study included patients beyond five years of their surgical interventions by which time the grafts and surrounded areas had matured well.

CONCLUSION

There is a good amount of sensory recovery in the split skin graft in most of the patients and initial hyperpigmentation of the split skin graft also resolves to a large extent. The skin grafts are a very good form of reconstruction; however, they need patience and efforts by the patient. They should continue to follow the advice of the treating surgeon to get best results at the earliest.

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