

Comparison of Repigmentation of Stable Vitiligo via Punch Grafting, Thin-thiersch's grafting and Suction Blister Grafting

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ABSTRACT

Background: Vitiligo is defined as an acquired melanocytopenia of obscure aetiology and is characterized by circumscribed hypomelanosis and depigmentation of skin and hair which is often progressive. The aim of present study is to compare between 3 surgical modalities i.e. miniature punch grafting, thin split-skin thickness grafting and suction blister grafting and to experiment a novel method according to the site, size and location of the lesion and to study the extent of re-pigmentation after doing these procedures and comparison of the results in patients of stable vitiligo. We also aim to assess the complications and disadvantages of different surgical techniques. **Methods:** The study was conducted on total 60 vitiligo patients, who were divided into 3 groups of 20 each, in the age group of 15-60 years, attending Dermatology Department of Katihar Medical College in the span of 2 years. **Results.** Results are comparable overall but vary considerably according to site of lesions. Punch grafting is very good for mobile areas like elbow, ankle and other joints; Thin – thiersch's skin grafting gives better results for flat areas like trunk, thigh, arms and face while Suction blister grafting gives satisfactory

results for lips vitiligo and also over small, oval lesions over flat sites. **Conclusions:** Thus, it can be finally concluded from this study that the surgical modality for treating a case of vitiligo cannot be generalized. Every patient should be evaluated individually according to anatomical site involved, size and shape of lesion, time required to achieve pigmentation, infrastructure available and patient's preferences.

Key words: vitiligo, punch grafting, suction blister grafting, repigmentation.

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INTRODUCTION

Vitiligo is an acquired cutaneous hypomelanosis with a 0.5–2% incidence worldwide, without predilection for sex or ethnicity. The clinical presentation is characterized by well-circumscribed white macules. Generalized vitiligo is

characterized by acquired depigmentation due to melanocyte loss, in a pattern that is non-focal and generally bilateral across the midline, though not necessarily symmetric.^[1] Vitiligo is characterized by a disappearance of epidermal and/or follicular melanocytes. It is likely that melanocytes are destroyed by an as-yet unknown process.^[2] It is believed that vitiligo is of polygenic trait and that a convergence theory, combining elements of all the different theories, autoimmune, neural, auto-cytotoxic and growth factor

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defect is the most accurate aetiology. Familial studies have shown the increased prevalence of vitiligo in close relatives of affected individuals. In a large series performed in India, this increase was about 4.5-fold in close biological relatives.^[3] The pattern of relationship between relative risk and degree of kinship indicates involvement of genetic factors, although it is not consistent with single-locus Mendelian transmission. The major genetic component in vitiligo pathogenesis and also the role of environmental factors were recently emphasized. Sporadic generalized vitiligo is associated with autoimmune thyroid disease, pernicious anemia, Addison's disease, systemic lupus erythematosus.^[4] Familial generalized vitiligo is also characterized by a broad repertoire of associated autoimmune diseases, such as thyroiditis, rheumatoid arthritis, psoriasis, adult-onset-dependent diabetes mellitus, pernicious anemia, and Addison's disease.^[5]

The natural course of disease is usually unpredictable, but is often progressive. After years of stabilization, a sudden exacerbation may occur. A more rapid progressive form of vitiligo may lead to a complete de-pigmentation within 6-12 months after onset of disease. Vitiligo can be treated by a number of medical and surgical interventions. The different surgical interventions are needling, tattooing, miniature punch grafting, split thickness skin grafting and cultured or non-cultured melanocytes transplantation.

AIM OF STUDY

The aim of present study is to compare between the 3 modalities i.e. miniature punch grafting, thin split-skin thickness grafting and suction blister grafting and to experiment a novel method according to the site, size and location of the lesion and to study the extent of repigmentation after doing these procedures and comparison of the results in patients of stable vitiligo. It was also aimed at assessing the complications and disadvantages of different surgical modalities and to provide treatment to patients of vitiligo that were resistant to medical therapies and to cut short the length and duration and the total cost treatment.

Surgical procedures aim to replace the melanocytes with ones from a normally pigmented autologous donor site. Several melanocyte transplantation techniques can be performed under local anaesthesia in an outpatient facility [6]. Punch grafting (tissue graft) is the easiest and least expensive method, but it is not suitable for large lesions and seldom produces even repigmentation. Epidermal blister grafting gives excellent cosmetic results, but it is time-consuming, and large areas cannot be treated. Ultrathin epidermal sheet grafting can treat larger areas (up to 200 cm²) but requires skill and experience. The highest incidence of adverse events occurs with punch grafting (scar formation at the donor site, cobblestoning of the acceptor area) followed by ultrathin epidermal grafting (transient or permanent hypopigmentation, hypertrophic scars on the donor site, milia formation on the recipient site) and suction blister epidermal grafting (transitory hyperpigmentation on donor site, imperfect colour matching on the recipient site).^[7]

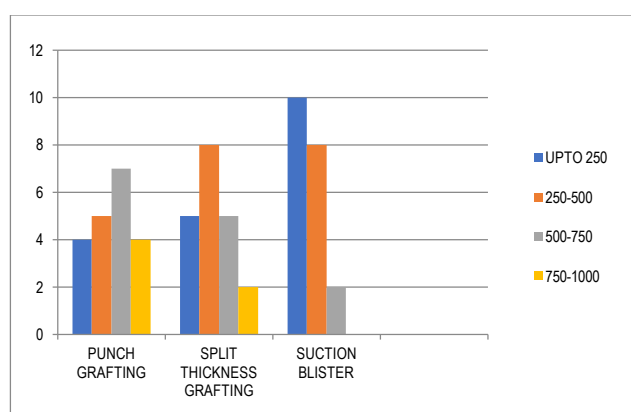
METHODS

The study was conducted on stable vitiligo patients of both sexes in the age group of above 15 years, attending Dermatology, Venereology and Leprosy Department of Katiyar Medical College & Hospital in the span of 2 years. Patients with active disease or those having > 10% BSA involvement were excluded from the study. Miniature punch grafting, Thin – thiersch's skin grafting and Suction blister grafting was done on stable, localised and resistant cases of vitiligo in 60 patients with altogether 75 sites in a span of 2 years. After a thorough pre-operative check-up and charting the area to be grafted, they were divided in 3 groups with 20 patients in each group and grafted with the three different methods.

RESULTS

Most of the patients were in age-group 15-30 years (78%). The sex ratio was almost same with slight female preponderance with 34 females and 26 males. Age of onset of disease ranged from 9-58 years. In most of the patients onset of disease was in between 11-20 years. In 20% it was between 21-30 years. Lesser patients were in the age group of 41-50 years (11%) and 51-60 years (9%). 58% had disease of 1-2 years duration, 12 patients (27%) had disease of duration of 3-5 years while only 15% patients were having disease of longer duration. Cases included in the study were stable since last 1-6 years. 62% patients have stable disease since last 1-2 years whereas only 7% patients have stable disease of more than 6 years. Majority of patients (75%) were having focal vitiligo while lesser patients had segmental vitiligo (15%) and only 6 patients had lesions at multiple sites.

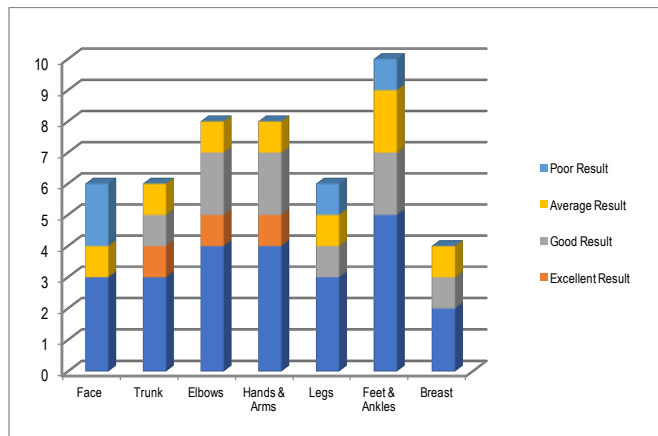
In this study, smaller lesions were subjected to suction blister and split-skin thickness grafting while larger lesions were dealt with punch grafting but the overall total VASI in all three groups was equivalent.



Pre-Treatment VASI

A total 75 sites in 60 patients were subjected to surgery. The distribution of lesions in all the groups was comparable except the lip lesions which were more subjected to suction blister technique. Rest all the body parts were unequivocally dealt with the 3 different modalities. Out of 60 patients only 12% showed superficial scarring and 13% had infection at the donor site, while majority (73%) had no complications.

The complications seen had similar incidence in all 3 groups. Out of 60 patients, about 28% of patients developed complication at the recipient sites. Cobblestoning was a unique complication seen in 5 out of 24 (20%) patients of punch grafting, colour mismatch was also more common in punch grafting appearing as polka-dots. Erythema was the most common complication seen in 12% of total patients. In this study, majority of patients showed good and average result, about 67%. Excellent results were seen in lesions over trunk, elbow and hand. 17% Of patients showed poor results and half of them were face lesions.



Post Treatment VASI Group 'A' Punch grafting

The following pictures show the result obtained in a patient with vitiligo patch in the neck region who underwent punch grafting. Figure 1 shows the pre-treatment photograph of the patch in the neck region. Figure 2 and figure 3 shows the graft donor site from where multiple punch grafts were taken and the graft site where the grafts were placed respectively. Figure 4 shows grafts in situ. Figure 5 and 6 shows post treatment response after 6 weeks and 12 weeks respectively.



Fig 1

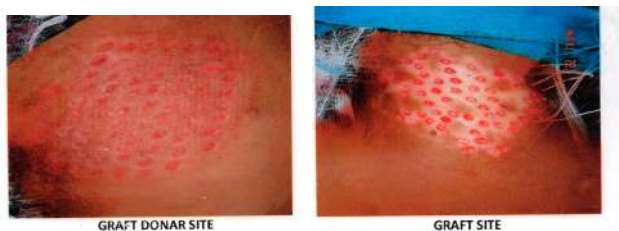


Fig 2

Fig 3



GRAFT IN SITU

Fig 4

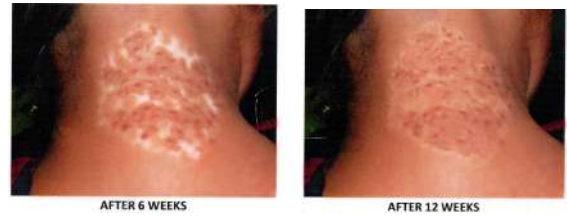
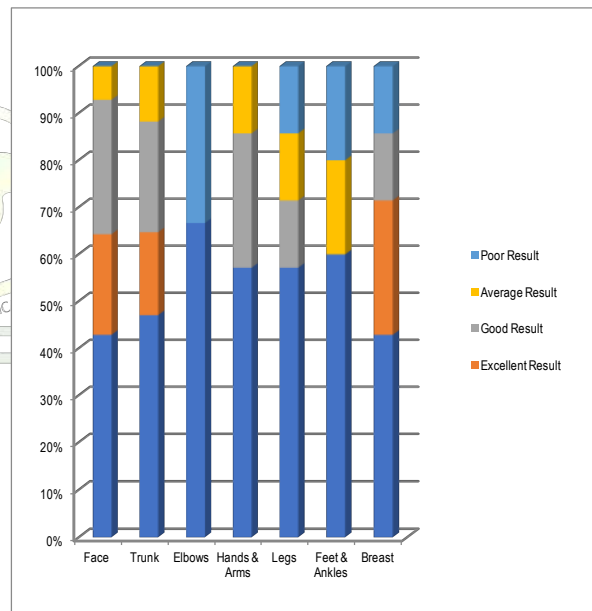


Fig 5

Fig 6

Post Treatment Vasi Group 'B'– Thin – Thiesch's Grafting In This Study, 27% Of Cases Showed Excellent Pigmentation and a Total Of 40% cases showing good or better results. Only 13% Had Poor Results; these cases had lesions over joints.



Post Treatment Vasi Group 'B'– Thin – Thiesch's Grafting

The following pictures show the result obtained in a patient with vitiligo patch over the waist region who underwent thin-thiesch's grafting. Figure 7 shows the pre-treatment picture of the patient. Figure 8 shows the graft being taken from the donor site. Figure 9 shows dermabrasion being done at the donor site and Figure 10 shows graft in situ. Figure 11 shows results obtained after 12 weeks.



Fig 7



Fig 8



Fig 9



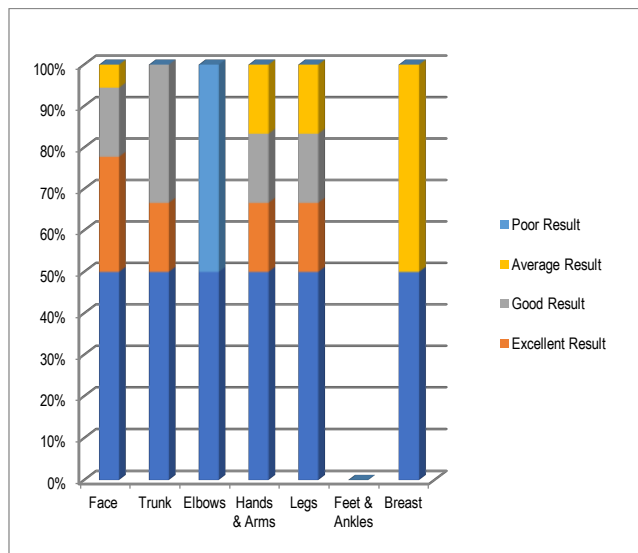
Fig 10



Fig 11

POST Treatment VASI- GROUP “C” SUCTION BLISTER

In this study, about 40% of patients showed excellent to good results, the lesions were mostly over face and lips. Only 1 patient (5%) with lesion over elbow showed poor result.



POST Treatment VASI- GROUP “C” SUCTION BLISTER

The following pictures show how suction blisters were raised for a patient who underwent suction blister grafting.



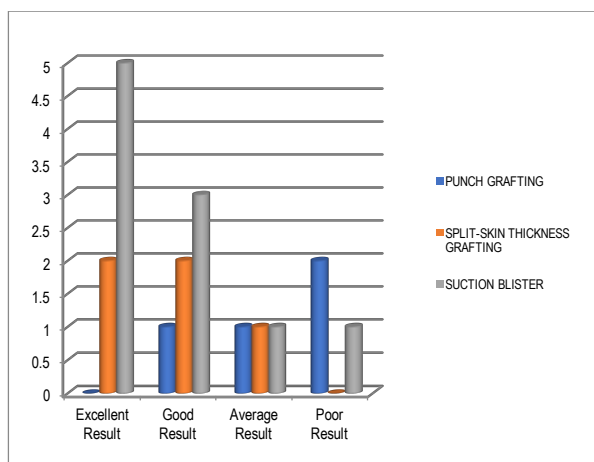
Fig 12



Fig 13

This study showed that almost equivalent results are seen in all 3 groups in terms of total pigmentation, but they have differences only in terms of sites of lesions. In this study, the difference in result of surgery over face and lip lesions was

showed. While 57% lesions in group C showed excellent results, in split-skin thickness grafting about 50% of cases showed excellent pigmentation while group A patients mainly showed average to poor results over lip vitiligo.



DISCUSSION

In the present study, 60 patients with 75 vitiliginous sites were selected and divided into three groups. The first group contained 20 patients with 30 disease sites over which miniature punch grafting was done. In the second group, 20 patients with 25 vitiligo sites on different parts of body were subjected to thin-split-skin thickness grafting. The last group contained 20 patients with 20 disease sites the maximum of which were lip lesions, and subjected to suction blister grafting technique.

This study showed various complications obtained at donor sites in different grafting techniques. In miniature punch grafting, superficial scarring was the most common complication encountered in 12% of the cases followed by infection in 8%. In the Thin – thiersch’s grafting patients, superficial scarring and infection was seen in equal number of patients (15% each) while no complication was seen in rest 70% of patients. In the third group of suction blister grafting, even lesser degree of complications were seen at donor sites, infection in 2 out of 15 sites and superficial scarring in 1 case.

This study showed the complications seen at the recipient sites in different groups. Erythema was most common and was found almost equally in all treatment groups Cobblestoning was unique complication seen only in patients undergone miniature punch grafting in 21% of the sites. Colour mismatch of the graft with surrounding area was seen almost equally in all 3 groups.

Study showed the results obtained after 6 months of punch grafting. Excellent results were obtained in 3 out of 24 sites, 1 each over trunk, hands & arms and legs. Good pigmentation i.e achievement of 75% IN PRE-TREATMENT VASI was obtained in a fair number of patients, about 34% . Good results were seen at almost every site except for face and lips. 1 case lip vitiligo showed average result while 2 showed poor re-pigmentation on mobile areas like elbows and ankles, the results were also not good.

The study showed the re-pigmentation obtained in 15 patients with 20 sites undergone thin split-skin thickness grafting. Excellent results were obtained in 25% of cases, 2 each on face and trunk and 1 case over breast. About 40% sites showed good degree of re-pigmentation over almost every site except for joints like elbows and ankles. Poor results were seen at these sites.

Study showed the result of suction blister done over 20 sites. Excellent re-pigmentation at the end of 6 months was seen in one – third of patients but the majority of them were on vitiligo of lips. Over trunk and extremities the results were good (33%) and average (27%) while on joints, it was poor. The study showed the overall pigmentation results in the 3 treatment groups. Punch grafting patients mainly showed average to good pigmentation over trunk and joints but poor pigmentation over lips. Suction blister and thin split skin thickness grafting patients had excellent results over lips and other flat areas while they showed poor re-pigmentation over elbows and ankles.

CONCLUSION

Punch grafting is very good for mobile areas like elbow, ankle and other joints, but gives poor results for angle of mouth, lips and fingers. Thin – thiersch's skin grafting gives better results for flat areas like trunk, thigh, arms and also face including lips, but is technically difficult to obtain thinner graft and the thinner the graft, the better the result. Suction blister grafting gives very satisfactory results for lips

vitiligo and also over small, oval lesions over flat sites, but gives poor results for mobile areas and is unsuitable for larger lesions.

Thus, it can be finally concluded from this study that the surgical modality for treating a case of vitiligo cannot be generalized. Every patient should be evaluated individually according to anatomical site involved, size and shape of lesion, time required to achieve pigmentation, infrastructure available and patient's preferences. Patient should be counselled for all possible therapeutic options and should be given liberty to choose from the available modalities.

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