

Comparative Evaluation of Punch Grafting, Suction Blister and Split Thickness in Treatment of Stable Vitiligo: A Prospective Study

Suraj Bali¹, Mrityunjay Kumar Singh², Anil Kumar Soni³

ABSTRACT

Background: Vitiligo is a common acquired idiopathic and often familial hypomelansosis which is characterised by pale, white macules that enlarge centrifugally over time. Study aimed at comparative evaluation of punch grafting, suction blister and split thickness in treatment of stable vitiligo.

Material and Methods: In this prospective study total 45 patients of stable vitiligo were included. Punch grafting was done on 25 patients, suction blister was done on 15 patients and, split thickness was done on 5 patients. The results were evaluated after follow up period of 2 month, 4 month and 6 months. 0

Results: Results were observed in the form of repigmentation. Complications were seen in form of superficial scarring, cobble stoning, sinking pits, graft rejection, keloid / hypertrophic scar, raised rugosed surface and loss of pigment.

Conclusion: On the basis of study we concluded that suction blister is better technique followed by punch grafting and split thickness. By suction blister we can obtain cosmetically better results and higher percentage of excellent results in shorter duration.

Keywords: Vitiligo, Punch Grafting, Suction Blister, Split Thickness Skin Grafting

MATERIAL AND METHODS

A total of 45 stable vitiligo patients were included in this study. The study was carried out in the Department of dermatology, Nehru Hospital, B.R.D. Medical College, Gorakhpur.

A detailed clinical history was taken with special reference to age, sex, marital status, occupation and place of residence. The criteria for selection was based on patients having stable vitiligo. A complete clinical history for the diagnosis of stable vitiligo was taken along with age at onset, duration, family history, progression and response of disease with treatment taken for it. A thorough clinical examination was done in good day light with special attention to cutaneous lesions of vitiligo for their number, shape, size, colour and sites. The BCG scars or old scars were examined for keloidal tendency.

In all three procedures The donor area was shaved properly, cleaned with spirit and betadine and anesthetize by 2% xylocaine (intradermally) and recipient site was also surgically prepared and anesthetize locally by 2% xylocaine.

Punch Grafting: It was carried out in 25 cases of stable vitiligo. The donor site chosen were thigh and gluteal region. Commonly used size of skin biopsy punch at donor site were 2 and 2.5 mm. The grafts were harvested into the sterile petri dish containing normal saline to maintain the vitality of grafts. Skin biopsy punches 0.5 mm. smaller than donor size were used to punch out vitiliginous skin upto the depth of mid dermis, many such punched out chambers were made in the recipient area so that they were 5 to 10 mm away from each other. The chambers were then dilated with punch guards 0.5 mm larger in diameter and then, harvested punch grafts were placed individually to each chamber ensuring that the dermal side of graft is in direct contact with the dermis of the recipient chamber.

Suction Blister Epidermal Grafting: It was carried out in 15 patients of stable vitiligo. The donor site chosen were flexor surface of forearm, medial aspect of upper arm and thigh region. Then on fully stretched skin suction cups were applied to create negative pressure of 200-300 mmHg for 1-2 hours until blisters were formed large enough to be grafted. The recipient areas were then dermabraded until the appearance of uniform pin point bleeding. After this, blister tops were cut all along their border with curved iris scissors and were everted over glass slide which

INTRODUCTION

Vitiligo is a pigmentary disorder characterised by areas of depigmented skin resulting from loss of functioning epidermal melanocytes and sometimes hair follicle melanocytes. It affects between 1% and 2% of the general population without any racial sexual or regional differences in prevalence. Onset may occur at any age peaks in the second and 3rd decades of life.²⁻⁵

surgical methods are recommended for lesions that are stable and refractory to medical therapies. "stable vitiligo" is a term coined for cases where the disease is inactive and no new patch has developed in past 1 year (Manish et al 1994).⁶

Punch grafting is a technique in which miniature thin split thickness, 1-3 mm in size punch grafts are taken from donor area and are then transplanted to the recipient vitiliginous area in which chamber are made by punches followed by PUVA-sol therapy for 3-6 months. which further enhances the repigmentation.⁷⁻¹⁰ Suction blister epidermal grafting is a technique in which split thickness grafts containing only epidermis are obtained by application of a prolonged negative pressure at the donor site, followed by securing these epidermal sheets to the dermabraded recipient vitiliginous sites.¹¹⁻¹⁵ Split thickness grafting consists of epidermis and part of upper papillary dermis and grafting it on the dermabraded patch of stable vitiligo and further securing it with either pressure or surgical glue and local immobilization.¹⁶⁻²⁰ So study aimed at comparative evaluation of punch grafting, suction blister and split thickness in treatment of stable vitiligo.

¹Assistant Professor, ²Associate Professor, ³Junior Resident, Department of Skin and V.D., LLRM Medical College, Meerut, Uttar Pradesh, India

Corresponding author: Dr. Suraj Bali, L-18, LLRM medical college, Campus, Meerut (U.P.), Pincode-250004, India

How to cite this article: Suraj Bali, Mrityunjay Kumar Singh, Anil Kumar Soni. Comparative evaluation of punch grafting, suction blister and split thickness in treatment of stable vitiligo: a prospective study. International Journal of Contemporary Medical Research 2017;4(4):801-804.

were already smeared with antibiotic cream. Grafts were fully spread over glass slide. Glass slides were then inverted over the dermabraded recipient area in a manner that the dermal surface of the graft sticks to the recipient area. Special care was taken to prevent curling of the edges of graft with the help of graft spreading rods.

Split Thickness Grafting: Split thickness grafting was done as advocated by Behl, in 1964. The donor site was lateral aspect of thigh in all the 5 cases. Appropriate sized sterile blades attached to the knife (*Humby's/Beldec forceps/ Silver's Week's*) are used. The cutting edge was kept close to the surface so that the thinnest graft could be obtained. The donor area was lubricated with glycerine/jelly and the site was flattened with the help of wooden block. Assistant puts his one hand below the area from where the graft is being harvested and other hand behind the moving knife, shaving is done with slight movement with one hand of operator is kept in front of moving knife. The translucency of the graft was the main index of thickness. Very thin graft is translucent and the colour of blade can be easily seen through it.

Recipient Site: The vitiliginous skin was dermabraded with help of manual dermabrader by making side to side, parallel and criss-cross movements till the capillary bleeding was seen. The dermabrasion was extended by 2-3 mm beyond the margins on normal skin. This was done to prevent perigraft halo. There should be no bleeding or oozing while placing the graft at recipient site. The graft was little larger than recipient site. The graft was spread over bowl surface and multiple punctures were made which was aimed to free out flow of serum. Then the graft was lifted up with non-traumatizing forceps and two dermal surface were kept facing each other. With the help of spreading spatula/rod's the margins were adjusted beyond the margins. Before dressing the following points were checked. Uniform application of graft, No excess blood or serum on recipient area, edges should not be curled or covered up, graft should be stretched and smoothed.

After achieving all these, In all the three procedures, donor and recipient area were dressed with double layer of sofratulle and bandage. Immobilization advised where required, follow up dressing of the recipient area was done after 24 hours to check and replace the shifted grafts.

After 8-10 days dressings from donor area and recipient area were removed.

In form of postoperative medication antibiotics and anti-inflammatory drugs were given for 8-10 days. PUVA-SOL therapy was started from 8th-10th postoperative day upto 3-6 months till the repigmentation was achieved. Patients were followed up for 12-16 week. Initially there was hyperpigmentation with uneven borders, pressure bandage was advised and there was labelling out of edges in 12-14 weeks and also colour match. Patients were observed during post-operative recovery and for any complication viz; stick on tyre patch appearance, curling of borders with beaded appearance, mismatch colour, perigraft halo of depigmentation, reactivation of vitiligo.

STATISTICAL ANALYSIS

Microsoft office 2007 was used for the statistical analysis.

Descriptive statistics like mean and percentages were used for the data analysis.

RESULTS

A total of 45 stable vitiligo patients attending the Dermatology O.P.D. were included in this study. Out of total 45 patients, females were 31 (68.89%) and males were 14 (31.11%) with ratio of (female: male)-2.21:1. and out of 45 patients maximum number (7) of patients were seen in age group of 21-30 years of age. Duration (in years) of vitiligo was upto 6-10 years in 25 patients which was maximum. Most of the cases 23 (51.12%) in this study were of vitiligo with multiple lesions (vitiligo vulgaris). Most of cases operated 16 (35.56%) had their lesion on the lower extremities and next major group was of patient with lesion on face and neck.

Table 1- shows that out of total 45 patients, maximum patients 21 (46.66%) were of vitiligo vulgaris

Out of 25 patients who underwent punch grafting, only 12 patients (48%) could achieve excellent results (>85% repigmentation) while 7 (28%) could achieve good results (65-85% repigmentation), 4 patients (16%) had fair results (45-65% repigmentation) and 2 patients (8%) showed poor results (<45% repigmentation) due to secondary infection and immobilization and excellent result could achieve by the end of 6 months but none of these could achieve excellent results by the end of 2 months. Only 5 patients (41.66%) out of 12 could achieve excellent result by the end of 4 months and ultimately at the end of 6 months, 12 patients could achieve excellent result which clearly shows the rate of excellent result by the punch grafting is relatively slow.

Out of 15 patients who underwent suction blister epidermal grafting 10 patients (66.67%) of them developed excellent result, while 3 (20%) showed good result, 1 patient (6.66%) showed fair result and 1 patient (6.66%) showed poor and 10 patients could reach the result of more than 85% re-pigmentation (excellent result) by the end of 6 months but 9 patients (90%) has already achieved excellent result at the end of 2 months and at the end of 4 months, all the 10 patients had achieved excellent result. This shows that rate of excellent result is faster by suction blister grafting.

out of 5 patients who underwent split thickness grafting 2 patients (40%) of them developed excellent result (treated patch re-pigment with excellent colour matching), good in 2 patients (40%) and poor in 1 patient (20%) by the end of 6 months.

Table 2- shows that superficial scarring at donor site was found in all cases 25 (100.0%) in punch grafting and 5 (100%) in

| Type of vitiligo | Number of patients | Percentage (%) |
|------------------|--------------------|----------------|
| Localised | | |
| - Focal | 06 | 13.33 |
| - Segmental | 02 | 04.44 |
| Generalised | | |
| - Acrofacial | 07 | 15.56 |
| - Vulgaris | 21 | 46.66 |
| - Universal | 00 | 00.00 |
| Mixed | 09 | 20.00 |
| Total | 45 | 100.0 |

Table-1: Distribution of patients according to type of vitiligo

| Complication | Punch grafting | Suction blister grafting | Split thickness grafting |
|--|--------------------|--------------------------|--------------------------|
| | Number of patients | Number of patients | Number of patients |
| Superficial scarring at donor site | 25 | 00 | 05 |
| Cobble stoning | 12 | 00 | 00 |
| Sinking pits | 01 | 00 | 00 |
| Variegated pigmentation | 05 | 03 | 00 |
| Graft rejection due to movement or secondary infection | 02 | 00 | 01 |
| Keloid/hypertrophic scar | 00 | 00 | 01 |
| Raised rugosed surface | 00 | 00 | 01 |
| Loss of pigment | 01 | 00 | 00 |

Table-2: Adverse effects of treatment

split thickness grafting while it was not found in any case of suction blister grafting. Cobble stoning and sinking pits were also associated with punch grafting but were not associated with suction blister and split thickness grafting. Graft rejection was found in two cases of punch grafting and one case of split thickness but not in case of suction blister grafting.

Keloid/hypertrophic scar and raised rugosed surface was associated only with split thickness and loss of pigment was associated only with punch grafting. Variegated hyperpigmentation was associated with punch grafting and suction blister but not with split thickness grafting.

DISCUSSION

In the present study out of 45 cases, females 31 (68.89%) out numbered males 14 (31.11%). Male to female ratio was 1: 2.2. Fitzpatrick et al²¹ reported 73% females and 27% males Singh et al (1995)²² observed male to female ratio of 3:5.

In the present study, the age of patient ranged from 9 years to 49 years . Maximum number of patients 22 (48.89%) were in the age group of 21-30 years. Next common age group of 11 patients (24.44%) was 30-40 years. Vitiligo known to occur in any age group but peak incidence is between 10-30 years in most of the series. Jha et al²³ reported that most of the cases were in the range of 15 to 30 years. Similarly in a study of 62 cases done by Sawant²⁴ most of the cases were in the range of 19 to 35 years.

In the present study most of the cases 16 (35.56%) had vitiligo on the lower extremities. Similar to our study, lower extremities was found to be common site of involvement in the studies of Dutta et al²⁵.

In the present study out of 25 patients who underwent punch grafting, only 12 patients (48%) could achieve excellent results (>85% repigmentation) while 7 (28%) could achieve good results(65-85% repigmentation), 4 patients (16%) had fair results (45-65% repigmentation) and 2 patients (8%) showed poor results (<45% repigmentation) due to secondary infection and immobilization.

Koushik et al²⁶ reported that out of 60 patients who underwent punch grafting, only 31 of them achieve 70-100% repigmentation and 21 patients got 50-70% re-pigmentation. Five patients could re-pigment by 30-50% and 3 patients showed 0-30% improvement. Singh and Bajaj²² conducted punch grafting in 32 patients of stable vitiligo and found that fair to excellent results were observed in 87.5% of the patients.

In the present study shows that out of 25 patients who underwent punch grafting 12 patients could reach the result of more than 85% re-pigmentation (excellent result) by the end of 6 months

but none of these could achieve excellent results by the end of 2 months. Only 5 patients (41.66%) out of 12 could achieve excellent result by the end of 4 months and ultimately at the end of 6 months, 12 patients could achieve excellent result which clearly shows the rate of excellent result by the punch grafting is relatively slow. Similar to results of our study Koushik et al (1997) ²⁶ clearly reported that out of 60 cases who underwent punch grafting none of the patient could achieve 70-100% repigmentation by the end of 3 months after surgery and it is only by the end of 6 months that 5 patients could achieve to 100% repigmentation. Singh and Bajaj (1995)²² did punch grafting in 32 patients of stable vitiligo and reported that most of the grafts changed brown to black and upper scab desquamated within 10-15 days. Uniform perigraft pigmentation was observed by 1A months and 90% area was covered after 3-4 months

In the present study out of 15 patients who underwent suction blister epidermal grafting 10 patients (66.67%) of them developed excellent result (>85% re-pigmentation), while 3 (20%) showed good result (65-85% re-pigmentation), 1 patient (6.66%) showed fair result (45-65% re-pigmentation) and 1 patient (6.66%) showed poor (<45% re-pigmentation).

Shah et al²⁷ reported that out of 18 patients of vitiligo who underwent suction blister epidermal grafting, approximately 90% of patients achieved repigmentation more than 80%, and exactly speaking 27.8% cases achieved 100% cosmetically acceptable result and 61.1% achieved 80 to 90% cosmetically acceptable result after surgery.

In the present out of 15 patients who underwent suction blister grafting, 10 patients could reach the result of more than 85% re-pigmentation (excellent result) by the end of 6 months but 9 patients (90%) has already achieved excellent result at the end of 2 months and at the end of 4 months, all the 10 patients had achieved excellent result. This shows that rate of excellent result is faster by suction blister grafting.

In 1997, Mukhtar et al²⁸ reported that by suction blister epidermal grafting normal colour matching was seen at the recipient sites after 3 months. Tawade et al²⁹ also reported that after suction blister epidermal grafting, at recipient site in the initial phase the area appeared hyperpigmentation but it lightened over the period of 3 months to give uniform pigmentation.

In the present study out of 5 patients who underwent split thickness grafting 2 patients (40%) of them developed excellent result (treated patch re-pigment with excellent colour matching), good in 2 patients (40%) and poor in 1 patient (20%) by the end of 6 months.

In the present study as shown out of 5 patients there were only 2 patients who had developed excellent result constantly by the

end of 2 months, 4 months and 6 months. El-Tonsy et al³⁰ did split thickness in 25 patients and observed excellent result in 10 patients (40%), very good results in 9 patients (36%), good result in 5 patients (20%) and poor in 1 patient (4%).

Thus in the present study the excellent results were obtained by suction blister (66.67%) followed by punch grafting (48%) and split thickness followed by split thickness (40%) respectively after 6 months.

Excellent results were obtained in shorter duration by suction blister (60%) and split thickness (40%) at the end of 2 months compared to punch grafting (20%) only after 4 months. So the rate of obtaining excellent response was highest in suction blister.

CONCLUSION

On the basis of above study, we can conclude that suction blister grafting is better technique followed by punch grafting and split thickness respectively.

By suction blister epidermal grafting we can obtain cosmetically better results and higher percentage of excellent results in shorter duration of time.

Punch grafting has better results as compared to split thickness grafting but split thickness grafting gives immediate results while punch grafting needs 2-3 months follow up with PUVASOL therapy.

REFERENCES

- Mosher DB, Fitz Patrick TB. Disorders Of Pigmentation. Third ED. New YORK, 1987;749-876.
- Robins A. Biological Perspectives On Human Pigmentation. England: Cambridge University Press; 1991.
- Grimes PE. Disorders Of Pigmentation. In: Dale DC, Federman DD, Editors. ACP Medicine. New York: Webmd Scientific American Medicine Inc; 2003. P. 526-34.
- Porter J. The Psychological Effects Of Vitiligo: Response To Impaired Appearance. In: Hann SK, Nordlund JJ, Editors. Vitiligo. England: Blackwell Science; 2000. P.97-100.
- Kovacs SO. Vitiligo. J Am Acad Dermatol. 1998;38:647-60.
- Kumar Manish, Rathi T, Singh AK, Punch Grafting In Treatment Of Stable Vitiligo. Ind J Dermatol. 1994;60:188-192.
- Lowenthal LJA. Punch Grafting With Autograft. Ama Arch Of Dermat And Syphil. 11953;67:629.
- Falabella R. Repigmentation Of Segments; Vitiligi Bu Autologius Minigrafting. J Am Acad Derm. 1983;9:514-521.
- Das SS, Pasricha JS. Punch Grafting As A Treatment Of Residual Lesions Of Vitiligo. Ind J Dermatol. 1992;58:328-330.
- Sawant SS. Autologous Miniature Punch Grafting In Stable Vitiligo. Ind J Dermatol Venerol Leprol. 1992;58: 310-304.
- Klistula U, Mustakallio KK. In Vivo Separation Of Epidermis By Production Of Suction Blisters. Lancet. 1964;1:1444-1446.
- Kustuva V. Suction Blister Device For Separation Of Viable Epidermis From Dermis. J Invest Dermatol. 1968;50:129-37.
- Falabella R. Grafting And Transplantation Of Melanocytes For Melanocytes For Repigmenting Vitiligo And Other Types Of Leucoderma. Int J Dermatol. 1971;28:263-69.
- Suvanprakoran P. Melanocyte Autologous Grafting For Treatment Of Leukoderma. J Amer Acad Dermatol. 1988;13:968-74.
- Koga M. Epidermal Grafting Using The Tops Of Suction Blister In The Treatment Of Vitiligo. Arch Dermatol. 1988;124:1656-1658.
- Behl PN And Bhatia RK. Treatment Of Vitiligo With Autologous Thin Thiersch Grafts. Int J Dermatol. 1973;12:329-31.
- Behl PN And Bhatia RK. Four Hundred Cases Of Vitiligo: A Clinic Therapeutical Analysis. Indian Journal Of Dermatology. 1972;17:51-55.
- Chitale VR. Overgrafting For Leukoderma Of The Lower Lip. Ann Plast Surg. 1991;26:298-90.
- Achauer BM, Le Y, Vander Kam VM. Treatment Of Vitiligo With Melanocytic Grafting. Ind J Dermatol. 1994;33:644-646.
- Skouge JW, Morcison WL. Autografting and PUVA. A Combination Therapy For Vitiligo. J Dermatol Surg Oncol. 1992;18:357-60.
- Fitzpatrick TB. Some aspects of vitiligo. J Society Cosmet Chem. 1971;15:297.
- Singh KG, Bajaj AK. Autologous miniature skin punch grafting in vitiligo. Ind J Dermat Venerol Leprol. 1995;61:7780.
- Jha AK, Pandey SS. Punch grafting in vitiligo. Ind J Dermatol. 1992;2:12-18.
- Sawant SS. Autologous miniature punch grafting in stable vitiligo. Ind J Dermatol. 1992;58:328-330.
- Dutta AK, Mandal SB. A clinical study of 650 vitiligo cases and their classification. Indian journal of dermatol. 1969;14:103-111.
- Koushik Lahari, Gupta SR. Sen. Treatment of stable and recalcitrant depigmented skin condition by autologous punch grafting. Ind J Dermatol Venerol Leprol. 1997;63:11-14.
- Shah H, Bharat S, Suresh Joshipura, Janak K, Thackkar. Surgical treatment in acrofacial vitiligo. Ind J Dermatol Venerol Leprol. 1994.
- Mukhtar M, Singh S, Shukla VK. Suction syringe for epidermal grafting. J Am Acad Dermatol. 1997;37:638-639.
- Tawade YV, Gokhle BB, Parekh A et al. Autologous graft by suction blister technique in management of vitiligo. Ind J Dermatol vener lepro. 1991;57:91-93.
- El-Tonsey et al. Repigmentation of vitiligo using split thickness grafting. Journal of Pan Arab League of Dermatologists. 2000;10:12-18.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 23-03-2017; **Accepted:** 21-04-2017; **Published:** 30-04-2017