

A Comparative Study of Efficacy of Miniature Punch Grafting and Platelet Rich Plasma Therapy in Treatment of Focal Stable Vitiligo in 50 Cases

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ABSTRACT

Introduction: Vitiligo, a depigmented skin disorder is characterized by selective loss of melanocytes, which in turn leads to pigment dilution in the affected areas of the skin. The characteristic lesion is a totally amelanotic, non scaly, chalky white macule with distinct margins. If the disease is not progressing for the past one year it is described as stable vitiligo. There are various treatment options available for the treatment of focal stable vitiligo. It can be safely treated with miniature punch grafting as well as platelet rich plasma therapy.

Aims and Objectives: Aim of this study is to compare efficacy of miniature punch grafting and platelet rich plasma therapy and to evaluate the outcome of treatment of focal stable vitiligo.

Materials and Methods: Total 50 patients were selected and divided into two groups. One group was treated with miniature punch grafting while the other group underwent platelet rich plasma therapy. Pre-treatment and post treatment assessment was done by VASI (Vitiligo area scoring index) score.

Result: A total of 25 patients were selected for grafting. Perigraft pigmentation was evident from 3rd week of grafting steadily increasing up to the end point of record i.e 6months. 17 patients showed good response, 4 patients showed average response while 4 patients showed poor or no response at all.

Out of the 25 patients taken for platelet rich plasma therapy, 7 patients showed good response, 7 patients showed average response while 11 patients showed poor or no response at all.

Conclusion: Miniature punch grafting showed better response as compared to platelet rich plasma therapy but both the therapies have their pros and shortcomings.

Keywords: Vitiligo, miniature punch grafting, platelet rich plasma, VASI

INTRODUCTION

Vitiligo denotes an acquired, usually progressive melanocytopenia of obscure etiology which is clinically manifested as ivory white macules of different size and shape, the disease affects both sexes equally. It can occur at any age but peak incidence is in the age group of 10-30 years. There is no racial bar for this condition.

It is clear that though 1-2% of general population has vitiligo, incidence is 8-20% in people with other autoimmune diseases such as diabetes mellitus, thyroid diseases, pernicious anaemia, Addison's disease etc.¹

Vitiligo is an asymptomatic and benign disease but sometimes it causes major psychological problems in dark skinned races. Widespread prejudices, ignorance, taboos, lack of scientific appraisal and confusion around vitiligo, all these make it a social embarrassment for patients in the society.

Omashkhyam has aptly said:

“A black spot on fair skin is a blessing; a white spot on a dark face is a curse”.²

As vitiligo is a melanocytopenic disorder, therapy should be aimed to replenish the melanocyte population.

A lack of response to conventional medical treatment indicates that the melanocyte reservoir within the hair bulb is no longer available. Under this circumstance melanocyte repopulation of vitiliginous area is not possible unless a new source of pigment cell is placed within the depigmented lesions by surgical methods. Stable vitiligo is a term coined for cases where the disease is inactive and no new patch developed in past 1 year.

There are various treatment modalities available for treatment of vitiligo such as:

1. Medical modalities: PUVA therapy, ACTH therapy, placental extracts, corticosteroid therapy, immunomodulators etc.
2. Surgical modalities: miniature punch grafting, platelet rich plasma therapy, suction blister grafting, melanocyte transplant, hair follicle grafting etc.

In autologous miniature punch grafting when a graft from normal skin is transplanted to an affected site, the transplanted graft maintains its integrity and characteristics, independent of the recipient site. Thus when a normal pigmented donor punch graft is transplanted onto a depigmented stable vitiligo area, it dominates (donor dominance) and the melanocytes in mini grafts not only continue to produce melanin, but also migrate to the adjacent depigmented epidermis. This is seen clinically as initial perigraft pigmentation. These pigmented islands later coalesce to completely repigment the vitiligo area in the next 3-6 months.

Recently, platelet rich plasma therapy has emerged as a new treatment modality in treatment of focal stable vitiligo. It contains platelets in a concentration of 5-7 times the normal blood level. PRP increases the release of growth factors, adhesion molecules and chemokines, which interacting with the local environment, promote cell

differentiation, proliferation and regeneration. The main platelet growth factors secreted are: platelet derived growth factor, transforming growth factor, vascular endothelial growth factor (VEGF), epidermal growth factor (EGF), connective tissue growth factor (CTGF) and insulin like growth factor-1 (IGF-1)³. All these growth factors may help in stimulating proliferation of melanocytes and repigmentation within vitiliginous patches

This study was undertaken to compare the efficacy of miniature punch grafting and platelet rich plasma therapy in treatment of focal stable vitiligo.

MATERIALS AND METHODS

Study Design

The study was carried out in accordance with the Good Clinical Practices and in compliance with the institutional regulations. This prospective, single centre, parallel comparative study of efficacy of miniature punch grafting and platelet rich plasma therapy in treatment of focal stable vitiligo was undertaken in outpatient department of Skin V.D and leprosy in a tertiary care hospital over a period of two years. The permission to conduct the study was taken from the Institutional Ethics Committee. Patients having focal stable vitiligo were screened and were divided into two groups. Twenty five patients were allotted to each group, one group was treated with miniature punch grafting while the other group was treated with platelet rich plasma therapy. Clinical and photographic record was made at baseline 1st visit and subsequent follow up visits.

Inclusion criteria

- Patients having focal stable vitiligo (absence of newer areas of depigmentation or enlargement of pre-existing lesions for 12 months).
- Involved body surface area less than 1%.
- Patient attending skin OPD regularly.
- Patients who are willing to give informed verbal and written consent.

Exclusion Criteria

- Patients with unrealistic expectations.
- Patients not giving consent.
- Pregnant and lactating women.
- Patients with history of keloidal tendency.
- Patients who cannot come for regular follow up.
- Patients with history of bleeding tendencies.
- Patients having scarring or atrophy at lesion.
- Mucosal vitiligo.

Initial Assessment

Patients with focal stable vitiligo satisfying the inclusion criteria were enrolled to attend a baseline assessment in which medical history was recorded, physical examination was performed and basic investigations were done and thereafter patients were divided into two groups.

- 1st group : miniature punch grafting
 - 2nd group : platelet rich plasma therapy
- 1. Miniature punch grafting:** Grafting was done on day 1 in this regimen and the lesion is assessed every 15 days for pigmentation via VASI (Vitiligo Area Severity Index) score.
 - 2. Platelet rich plasma therapy:** the lesion is treated with platelet rich plasma therapy and simultaneously assessed every 15 days by VASI score for a period of six months i.e 12 sessions.

Follow Up Examination

Assessment of improvement in pigmentation was done using VASI (vitiligo area severity index) score.

VASI score^{4,5}: The percentage of vitiligo involvement is calculated in terms of hand units. One hand unit (which encompasses the palm plus the volar surface of all digits) is approximately equivalent to 1% of the total body surface area. The degree of depigmentation is estimated to the nearest of one of the following percentages:

- 100% - complete depigmentation, no pigment is present.
- 75% - depigmented area exceeds the pigmented area.
- 50% - pigmented and depigmented areas are equal.
- 25% - pigmented area exceeds depigmented area.
- 10% - only specks of depigmentation present.

Total body VASI: S all body sites {hand units}{residual depigmentation}

The patients were examined initially and subsequently fortnightly for the response to therapy and presence of any side effects. The repigmentation response was expressed as reduction in VASI score. Based on improvement in VASI score after 6 months the response was graded as good response (VASI 10-25), average response (VASI 50-75), poor or no response (VASI 90-100). The complications that were noted during the follow up period were also documented.

RESULTS AND OBSERVATIONS

Response to therapy was assessed using VASI (vitiligo area severity index) score. The repigmentation response was expressed as reduction in VASI score. Based on improvement in VASI score after 6 months of initiating treatment the response was graded as good response (VASI 10-25), average response (VASI 50-75) and poor response (VASI 90-100).

Miniature punch grafting: Out of 25 patients, 17 patients (68%) showed good response to treatment, 4 patients (16%) showed average response while 4 (16%) patients showed poor or no response at all.

These results were comparable to study conducted by K.G. Singh and Manish T. Rathi where good to excellent response was observed in 62% and 76% of patients respectively.

In the study conducted by S.S Savant the number of cases with good to excellent results were more i.e. 86-94% compared to present study (68%).

Visible repigmentation started 3-4 week after grafting.

Platelet rich plasma therapy: Out of 25 patients treated, 7 patients (28%) showed good response, 7 patients (28%) showed average response while 11 patients (44%) showed poor or no response at all.

These results were comparable to the study conducted by Mahajan R et al. where good response was observed in 37.5 percent

of patients. 30 percent patient showed average response while 32.5 percent patients showed poor or no response at all.

The results are much better than the study conducted by Lim et al.⁶ which suggested no role for platelet rich plasma therapy in vitiligo.

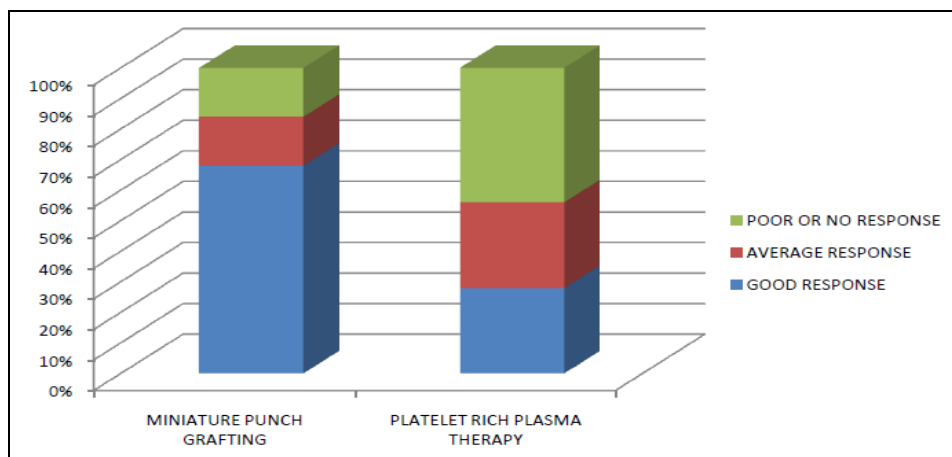
Visible repigmentation is usually seen after 6-8 weeks i.e. 3-4 injections of platelet rich plasma therapy.

Table 1: Observed Response With Different Treatment Modalities

Treatment	Good response	Average response	Poor response	Total
Miniature punch grafting	17(68%)	4	4	25(50%)
Platelet rich plasma therapy	7	7	11	25
Total	24	11	15	50
X² value is – 8.251 , p value – 0.0161				

The chi square value came out to be 8.251 while the p value came out to be

0.0161 thus suggesting that the findings of the study were statistically significant.



Complications were also documented and compared in the study.

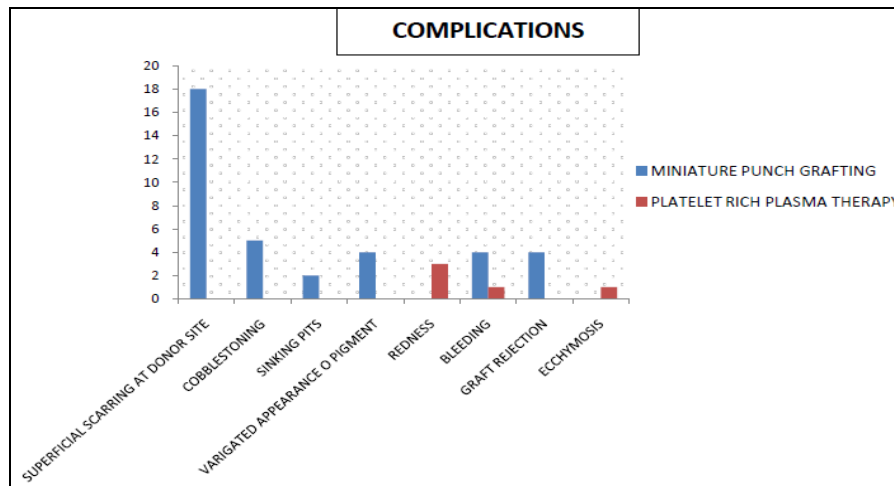
In Miniature punch grafting superficial scarring at donor site was the most common complication (72%), followed by cobble stoning (20%), variegated appearance, bleeding and rejection of grafts (16% each).

In platelet rich plasma therapy, the complications were negligible, redness (erythema) was noted in three patients (12%) and ecchymosis and bleeding were there in one patient each (2%).

No keloid or koebner vitiligo was observed in the study.

Table 2: Complications

Complications	Miniature punch grafting	Platelet rich plasma therapy
Superficial scarring at donor sites	18(72%)	-
Cobble stoning	5 (20%)	-
Sinking pits	2 (8%)	-
Variegated appearance	4 (16%)	-
Redness	-	3(12%)
Bleeding	4 (16%)	1(4%)
Rejection of grafts	4 (16%)	-
Ecchymosis	-	1(4%)
Koebner vitiligo	-	-
Keloid	-	-
Total	37	5



We can clearly make out that much higher in patients treated with incidence and severity of complications is miniature punch grafting.

Miniature Punch Grafting



Pre treatment photograph



Post treatment photograph

Platelet Rich Plasma Therapy



Pre treatment photograph



post treatment photograph

CONCLUSION

This study suggested that miniature punch grafting was more effective than platelet rich plasma therapy in treatment of focal stable vitiligo but the incidence and severity of complications was much higher in miniature punch grafting.

The patients should be briefed in detail about the efficacy as well as associated complications to clarify expectations and accordingly treatment should be advised.

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