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Original Article

Autologous Miniature Punch Skin Graft Procedure in 25 Cases of Stable Vitiligo

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Abstract

Background: Vitiligo is an acquired disorder of depigmentation of skin, hair, and mucosa. There are many numbers of medical therapies that may restore the pigmentation. When medical therapies fail, surgical methods should be considered. Among the various surgical modalities of treatment available for stable vitiligo, autologous miniature punch skin graft is an effective, simple office procedure.

Aim of the Study: The aim of the study was to treat the patient with stable vitiligo with the procedure of punch grafting and to observe the repigmentation process and cosmetic improvement.

Materials and Methods: A total of 25 cases of "stable vitiligo" were selected from the patients attending the outpatient department over a period of 10-year from 2005 to 2015, subjected to miniature punch grafting technique. Patient data, results and outcome tabulated after 12-month follow-up.

Results: About 25 cases were studied, out of which 9 were males (36%), 16 were females (64%) with a male to female ratio of 3:5; out of 25 patients, 15 had focal vitiligo, 6 had segmental vitiligo, 2 had mucosal lesions, and 2 had acrofacial vitiligo. Age group ranged from 12 to 50 years with mean age group ranged from 25 to 32 years. A total number of grafts taken were 222. Graft uptake rate was 77.8%. Overall, cosmetic improvement is 70% at the end of 12 months.

Conclusion: Miniature punch grafting is a simple, versatile procedure with good repigmentation and cosmetic outcome for patients with stable vitiligo.

Key words: Miniature punch grafting, Vitiligo, Repigmentation

INTRODUCTION

Vitiligo is an acquired disorder of depigmentation with the incidence of 1-2%, but may reach as high as 8%.[1] It is not only a dermatological problem but also a social stigma, often called by lay people as "white leprosy." Cosmetic disfigurement has a substantial impact on a person's social and professional relationship.[2] Due to this fact marriage proposals of both the sexes are affected and poses a problem to the parents and society.[3]

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At present, there are a number of medical therapies that may restore the pigmentation, some combination therapies give complete repigmentation in approximately 60-90% of cases of vitiligo.[4] When the medical mode of therapies fail, surgical methods should be considered.[4] Among the various surgical modalities of treatment available for stable vitiligo, autologous miniature punch skin graft is an effective, reliable and simple office procedure.[5-13]

MATERIALS AND METHODS

About 25 cases of "stable vitiligo" were selected among vitiligo patients attending skin outpatient department at Government Theni Medical College and ESI Hospital Coimbatore from January 2005 to December 2015. Selection criteria included stable vitiligo with no new lesions for the last 2 years and patients not improving inspite

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of long-term medical treatment. Patients with bleeding tendency, keloidal tendency were excluded from the study.

History regarding selection criteria, family, personal, occupation, and Last history was documented and the general examination was done. In dermatological examination, the skin type, the number, size, site, and type of vitiligo were assessed. Complete hemogram, stool examination, urine analysis, bleeding time, and clotting time were done.

Ear, nose throat, and dental examination were done to rule out focal sepsis. Endocrinology opinion regarding thyroid status was obtained in all the patients. Formal written consent was obtained from the patients. Photographs were taken before the procedure and during the follow-up reviews.

Procedure

Under local anesthesia and aseptic precautions, donor site was prepared. Upper lateral or anterior extensor aspect of thigh was the preferred donor site. 2.5 mm mini punch grafts were harvested until the depth of upper dermis with 1-2 mm of normal skin in between, in parallel rows of 10-15 such cuts. Grafts were transferred to tray moistured with saline gauze. Hemostasis by pressure achieved. Dressing with framycetin gauze was done.

Recipient site was prepared in the same way and 2 mm punches were rotated, keeping the distance 5-8 mm approximately between the grafts and pressured up to mid dermis approximately 1-1.5 mm in depth, and the achromic grafts were discarded.

The normal skin grafts already stored were transferred to these punched sites with assurance of dermal side down by assessing the glistening surface. Spreader was used to spread the grafts. Firm pressure with moist gauze was applied to achieve hemostasis and snug fit. The dressing was done as for donor site. Antibiotics and anti-inflammatory drugs were given for 7 days. The dressing was removed using saline water. Take up of grafts ascertained. PUVASOL was given for 3-6 months until repigmentation process occurs. Patients were followed up periodically for 1 year. The rate of repigmentation was documented and repigmentation ratio calculated.

RESULTS

About 25 cases were selected according to the selection criteria. These cases included 9 males (36%) and 16 females (64%) with a male to female ratio of 3:5, out of them 15 had focal vitiligo, 6 had segmental, 2 had mucosal, and 2 had acrofacial.

Age group of patients ranged from 12 to 50 years with mean age of 25-32 years (Table 1). Face was the most common site of distribution of vitiliginous patches followed by legs and other sites (Table 2).

A total number of grafts taken for surgery were 222. 182 grafts took well, and 40 grafts were rejected. Graft uptake percentage was the highest in focal type and least with acrofacial vitiligo. The average graft uptake rate was 77.8% (Table 3).

The onset of pigmentation varied from 2.5 to 12 weeks in the case of nonglabrous skin and 3.5-24 weeks in the glabrous skin. In the mucosa, pigmentation was observed in 4 weeks itself (Figure 1). With regard to the site, the pigmentation was observed earlier in the back followed by chest, face, scalp, and leg in the nonglabrous skin. In glabrous skin, the earlier pigmentation was observed in the feet followed by fingers and leg (Table 4).

Figure 1: Mucosal vitiligo, Repigmentation at 4 weeks, at 6 months

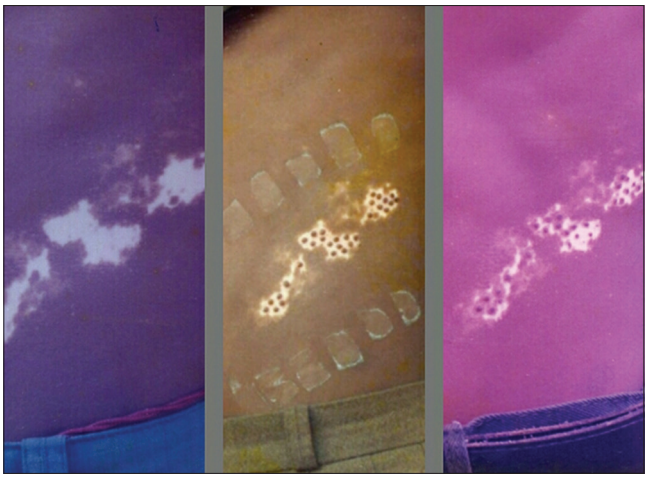

Figure 2: Segmental vitiligo – Repigmentation at 4 weeks, at 6 months

Table 1: The type of vitiligo with the age and sex distribution among 25 selected cases

Type of vitiligo	Total number of cases	10-20 years		21-30 years		31-40 years		Above 40 years		Percentage of type of vitiligo
		Male	Female	Male	Female	Male	Female	Male	Female	
Focal	15	1	7	2	1	-	3	-	1	60
Segmental	6	1	-	2	2	-	1	-	-	24
Mucosal	2	1	-	-	-	-	-	1	-	8
Acrofacial	2	1	1	-	-	-	-	-	-	8
Total	25	4	8	4	3	0	4	1	1	
(%)		48		28		16		8		100

Table 2: Distribution of lesions of vitiligo in selected cases

Site of vitiligo	Number of cases
Face	7
Leg	5
Lips	2
Back	2
Abdomen	2
Hands	2
Fingers	2
Scalp	1
Chest	1
Foot	1
Total	25

The onset of pigmentation was almost the same in the segmental (Figure 2), mucosal, and acrofacial types (Figures 3-5) with an average of 3.5-4 weeks. In the focal type, pigmentation was observed to occur between 5 and 8 weeks (Figure 6).

On an average, the rate of pigmentation in different types of vitiligo varied from 0.6 to 1.3 mm. The segmental type of vitiligo had the fastest spread (Figure 2), followed by focal, acrofacial, and the mucosal type (Figure 1).

Cosmetic assessment was done in relation to the age, sex, type, and site of vitiligo at the end of 12 months by a single blind observer. It was graded as excellent 91-100%, good 71-90%, fair 51-70%, and bad with <50% improvement (Table 5).

On an average, the cosmetic improvement was 83% in age group of 21-30 years and 67% in the age group of 10-20 years age and 17% in the age group of 31-40 years. The cosmetic improvement was 100% in a male patient with vitiligo.

The overall cosmetic improvement achieved was 70% in our study. Complications noted at the receptor sites are tabulated in (Table 6).

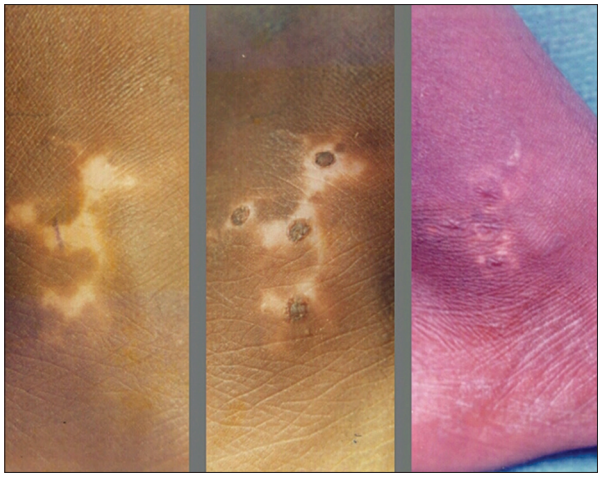

Figure 3: Focal vitiligo over ankle Repigmentation at 3.5 weeks and at 6 months

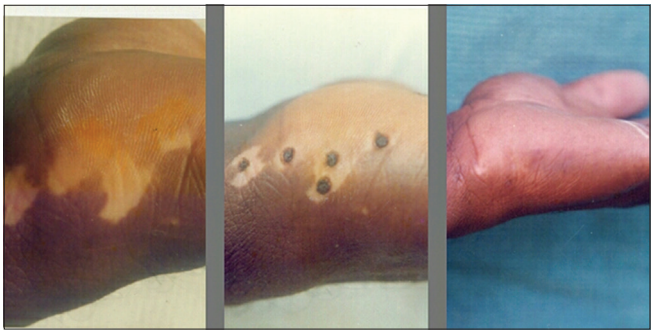

Figure 4: Vitiligo over palmar skin Repigmentation at 3 weeks and 4 months

DISCUSSION

Among the selected group of patients females outnumbered males, especially in the matrimonial age group.

The graft rejection in our study worked out to be 18% in contrast to the graft rejection of 10% reported by Das and Pasricha[10] Rejection could be avoided by mastering the technique and by providing proper dressing to the movement prone areas. The graft uptake in focal and mucosal vitiligo is similar to the observation made by the

Table 3: Depicting grafts "taken" and "rejected" in relation to the type of vitiligo

Type of vitiligo	Total number of grafts placed	Sex	Grafts placed	Total number of grafts taken	Grafts		Graft taken percentage	Total graft taken percentage
					Taken	Rejected		
Focal	84	M	11	79	11	0	100	97
		F	73		68	5	94	
Mucosal	6	M	6	5	5	1	83	83
		F	-		-	-	-	
Segmental	117	M	58	90	57	1	98	77
		F	59		33	26	56	
Acrofacial	15	M	7	8	4	3	57	54
		F	8		4	4	50	
Total	222			182	Average graft uptake			77.8

Table 4: The onset and rate of pigmentation in various types vitiligo and its completion

Site of vitiligo	Focal		Segmental		Mucosal		Acrofacial		Completion of pigmentation	
	Onset in weeks	Rate in mm/month	Onset in weeks	Rate in mm/month	Onset in weeks	Rate in mm/month	Onset in weeks	Rate in mm/month	In mm	In months
Non glabrous										
Chest			3	1.8					7	5
Scalp	4	1							4	5
Leg	12	1							1.5	5
Back	2.5	1.1							2.5	3.5
Face	4	0.3	4	0.8					4.5	5.8
Abdomen									3	6
Mucosa										
Lips					4	0.6			3	6
Glabrous										
Feet	3	1							3	4
Fingers							3.5	0.66	2	4
Hand		0.68							2.5	4.5
Leg (MM)	3.5	0.66							4	6
Leg	24	-							-	-

Table 5: Assessment of cosmetic improvement in relation to the age, sex, type, and site of vitiligo in the patients at the end of 12-months follow-up

Cosmetic improvement grading	Age				Sex		Type of vitiligo				Site of vitiligo		
	10-20	21-30	31-40	>41	Male	Female	S	Female	Male	AF	Non glabrous	Glabrous	Mucosal lips
Excellent (91-100%)				100									
Good (71-90%)		83					71	67	80		71		80
Fair (51-70%)	67					57						56	
Bad < 50%			17							15			

Over all cosmetic improvement = 70%. Type: S –Segmental ;F-Focal; M-Mucosal; AF-Acrofacial

others. The reason for this could be the smaller areas of involvement in the above types.[5,6,8]

The onset of pigmentation in 3-4 weeks in the cases studied was also similar to the observations made by others.[5,6,9-14] However, the pigmentation took longer to appear in the nonhairy areas of the leg which is also trauma prone, photo protected and with lesser vascular supply (Figure 3). This area is also observed into be less responsive in the previous studies.[9-14]

Mode of pigmentation was similar as noted by Savant in his study.[9] The grafts acted as pigment reservoirs producing more pigment in addition to the melanocyte proliferation and coalization toward the depigmented area.

Rate of pigmentation was more in the nonglabrous hairy skin, followed by mucosa and glabrous skin, similar to the observation of Rathi and Singh.[13] Rate of pigment spread was greatest with segmental type followed by focal, mucosal, and acrofacial types was seen in studies by others too.[5,6,9-14]

Table 6: Observation at the donor sites in vitiligo patients treated with punch grafts

S. No.	Donor site changes	Number of cases			Age group								Total (%)
					10-20		20-30		30-40		>40		
		T	M	F	T	A	T	A	T	A	T	A	
1.	Scarring	21	9	12	11	11	8	8	4	2	-	-	84
2.	Depigmentation	1	1	-	-	-	-	-	-	-	-	-	4

T: Total number of case, M: Male, F: Female, A: Total number of affected cases

Figure 5: segmental vitiligo over right cheek.pigmentation at 4 weeks and 5 months.

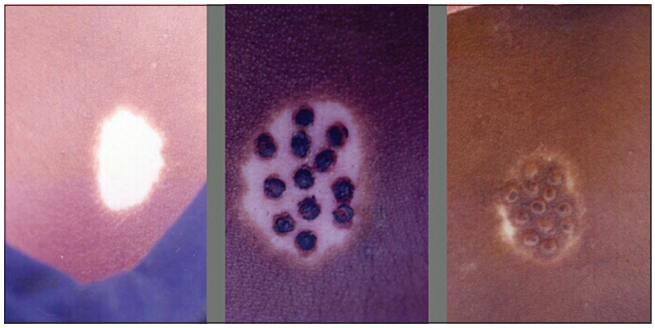

Figure 6: Focal vitiligo over back ,pigmentation at 2.5 weeks and 3.5 months.

Repigmentation achieved in around 5 months in our study with PUVASOL was in contrast to the studies made by others[10] without PUVASOL, where in pigmentation could be achieved only after 6 months.

Complication at the recipient site included depigmentory joining line which is the most common complication comparable with other studies.[8,9-14]

The cosmetic improvement was best in the age group of 20-30 years in both males and females with a better response in females than males. This finding was in concurrence with the previous studies.[8,9-14]

CONCLUSION

Miniature punch grafting is a simple, versatile procedure with good repigmentation and cosmetic outcome for patients with stable vitiligo.

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