SURGERIES IN VITILIGO - A REVIEW ARTICLE

V GAWANDE*, S KAR **, D GUPTA ***

ABSTRACT

Vitiligo is a common skin disorder of our country. Many of the patients are refractory to medical treatment. Dermato-Surgery is very rewarding in these cases. The only major indication is, it should be stable vitiligo. Thus proper selection of technique will play a major role in achieving good therapeutic and end cosmetic results. Each technique has its own advantages and disadvantages.

Key Words : Stable Vitiligo, Vitiligo Surgeries

Introduction :

Vitiligo is a common skin disorder characterized by development of white patches on the skin. In India the incidence of Vitiligo is estimated to be between 3-4% in general population. It was called "SHWETA KUSTHA" in the sacred Indian book "Atharvaveda" (1400 B.C.) and "Sultra" in "Manusmriti" (200 B.C.). In south India it is called "VEN KUSHTHA" meaning White Leprosy. In spite of all available medical therapies for Vitiligo, a significant number of patients fail to respond with appropriate pigmentation. Since 1964 various surgical techniques and modifications have been reported to treat recalcitrant but stable Vitiligo with permanent and almost complete repigmentation. Vitiligo lesions should be strictly stable for minimum of 2 years i.e. existing lesions should not be expanding and no new lesion should have developed in this interim.

SURGICAL TREATMENT MODALITIES

1) Suction Blister Technique :

The in vivo separation of epidermis from rest of the skin by production of a suction blister was first reported by Kiistula and Mustakallio in 1964. A complete physiological dermoepidermal split was possible using this technique. The piston of 20 c.c. syringe is removed and 3 way connector is attached to its needle end piece. The basal rim of this 20 c.c. syringe is then applied to the fully stretched donor site. An assembly line consisting of polyvinyl tubing (I.V. Line), 3 way connectors, manometer (vacuum gauze) and 50 c.c. syringe is then attached to the 3 way connector of the 20 c.c. syringe. Suction is then given by 50 c.c. syringe and is monitored on the connected vacuum gauze so as to create negative pressure of 250-350 mm of Hg. The 20 c.c. syringe along with the attached 3 way connector is retained by changing the position of lock of 3 way connector. Due to the negative pressure inside the basal rim of syringe, it remains adherent to the donor site in a vertical position along with the attached 3 way connector. Multiple such 20 c.c. syringes (8-10 or more) can be applied similarly next to each other as per the area of recipient site required to be
grafted. Negative pressure is retained for 1-2 hours. Time required for separation is 45 mins to 2 hours. Local anaesthetic with 1% Lignocaine is given. Vitiligo area is dermabraded till pin point bleeding seen and dermabrasion is done 1-2mm beyond the Vitiligo area. Blister is cut all along its border with curved iris scissors and its roof is everted over glass slide which is smeared with antibiotic cream which prevent chances of graft rejection and wrong placement of epidermal side. Over the dermabraded recipient area invert the glass slide with graft. Each graft is individually implanted. Graft edges should extend 1-2mm beyond the vitiligo area. Surgical glue (N butyl 2 cyanoacrylate) applied to the free edges of graft and not over dermabraded area. Dressing is done with double layer of framycetin tulle, two layers of gauze piece and pressure dressing with elastoplasts. Dressing opened after 24 hours if seroma and drained it by puncturing and redressed. Dressing of donor area is done. The recipient area is then treated with either PUVA / PUVA SOL or topical steroids leading to spread of pigment from the transplanted grafts to the surrounding skin. With time the whole of the recipient area gets repigmented. The advantages of this procedure are that it is easy to perform and can take care of a relatively larger vitiligo area as compared with the above procedure. There are chances of cobblestone appearance, polka dot appearance, sinking pits, depigmentary junctional lined and hypertrophic changes at recipient site. It takes three to six months for complete repigmentation. This technique can easily be used for stable vitiligo of anatomically difficult sites such as lips, tips, eyelids, palms, scalp etc., with a success rate of 85%-95%.

2) Punch Grafting
Bonafe et al in 1983 used punch grafting for treatment of Vitiligo patients with residual depigmentation in vitiligo. Here full thickness punch grafts of 1.0 - 2.5 mm diameter are taken from a suitable donor side and then transplanted on to recipient vitiligo site. The distance between two punch grafts should be 4-5 mm. Donor sites are anterior, posterior and lateral aspect of thigh, gluteal region and retroauricular area. Punch of donor side is 0.5 mm more in size than recipient site as there is shrinkage of graft. The recipient area is then treated with either PUVA / PUVA SOL or topical steroids leading to spread of pigment from the transplanted grafts to the surrounding skin. With time the whole of the recipient area gets repigmented. The advantages of this procedure are that it is easy to perform and can take care of a relatively larger vitiligo area as compared with the above procedure. There are chances of cobblestone appearance, polka dot appearance, sinking pits, depigmentary junctional lined and hypertrophic changes at recipient site. It takes three to six months for complete repigmentation. This technique can easily be used for stable vitiligo of anatomically difficult sites such as lips, tips, eyelids, palms, scalp etc., with a success rate of 85%-95%.

3) Follicular Unit Grafting
In this technique, single follicular units are harvested / prepared from a suitable donor area. These follicular units are then cut above the level of the follicular bulb and then transplanted into vitiligo lesions. The melanocytes in this follicular unit get donated to vitiligo site and serve as a source of pigment. This repigmentation process simulates normal
process of repigmentation of vitiliginous skin quite closely and thus gives an excellent cosmetic result. Procedure needs a good expertise hand and stable patient mind.

4) **Ultra thin skin Grafting (UTSG)**

(Melanocyte Transplant / Transfer)

Falabella in 1971 used epidermal sheets obtained by suction blister technique to successfully repigment small vitiliginous areas through melanocyte transplant. Olson and Juhlin also used UTSG to transplant melanocyte on to the dermabraded vitiligo areas with good results. This procedure carried out under LA or GA consists of obtaining ultra thin split thickness skin grafts containing epidermis and upper most part of superficial papillary dermis from the donor site, to achieve repigmentation through melanocyte transplant by securing the obtained graft sheet over the LASER ablated or dermabraded vitiliginous recipient site. During the wound healing phase, melanocytes and keratinocytes migrate from the ultra thin graft and get entrapped. The transferred / transplanted melanocytes multiply and repigment the vitiliginous areas. Repigmentation process is accelerated by further use of PUVA / PUVASOL. Growth factor and cytokines released during wound healing process help in migration, transplantation and multiplication of melanocytes.

5) **Thiersch's Split Thickness Grafting**

Skin grafting was described in Indian texts (Sanskrit) around 2500-3000 BC as a technique for nasal reconstruction. Behl in 1964 was the first to report the use of Thiersch's skin grafts to treat vitiligo. Thin Thiersch's Split thickness grafting involves transfer of epidermis along with a portion of dermis from a normal donor site and grafted on the affected site. This procedure carried out under LA (1% lignocaine or EMLA cream) or GA, consists of obtaining a very thin, split thickness skin grafts consisting of epidermis and part of upper papillary dermis and grafting it on the dermabraded patch of stable vitiligo and then further securing it with either pressure or surgical glue (N-butyl 2 - cyanoacrylate) and local immobilization. With advent of surgical glue dressing has become easier. Dermabrader used is mechanical (Manual) or Electrical. Dressing removed after 10-12 days, advised not to scrub the area for further 2 weeks. Grafts are taken up by 8 to 10 days. They initially turn hyperpigmented with uneven borders. Gradually they become lighter in colour and the border merges so as to match the surrounding skin colour (usually 2 to 3 months). The treatment is simple to learn and when mastered gives rapid satisfactory results. It is useful when large areas of vitiligo are to be surgically treated. Because of its effectiveness and good cosmetic results it is one of the most popular surgical modality used for the treatment of stable vitiligo. Large area can be covered in a single sitting. Office procedure if patch is small. For large patches ,even if GA is used patient need not be hospitalized. Graft survival chances are good because it is thin split thickness graft. Mild amount of hyperpigmentation and contracture will occur at grafted site. There are chances of vitiligo at donor site. As these grafts are very thin, prone for trauma. It's a major surgery
6) **Autologous Skin Grafts**

Autologous split thickness grafts have been used to cover the depigmented areas for better appearance. Larger areas can be covered at the same time, thus giving uniform pigmentation unlike the cobblestone appearance of punch grafts. The only disadvantages are hyperpigmentation for a long duration and limitation of donor site may require multiple sittings\(^2\).

7) **Mesh Grafts**

This is a technique where skin graft can be expanded by meshing it. This is done when there is limitation of donor site and larger areas are required to be covered. The only disadvantages are that cosmetic results are inferior as compared to other available methods and if the graft is thick, it may give beaded appearance at the margins.

8) **Melanocyte Culture Transplantation**

Relatively more advanced grafting procedure in which split thickness graft is taken from donor site. For obtaining a pure culture of melanocytes certain growth promoting factors for melanocytes such as TPA [tetradecanoyl phorbol 13 acetate] IBMx [isobutyl methylxanthine], placental extracts and fibroblasts growth factors are first added. Selective growth inhibition of keratinocytes and of fibroblast and langerhans cells by addition of cholera toxin to media is carried out\(^3\). The cultured cells are transferred to LASER dermabraded or mechanically abraded vitiligo area\(^6,15\). Fully equipped tissue culture laboratory is required for melanocyte culture. Excellent results with this procedure and large area is treated with single donor graft.

9) **Cultured Epidermal Cell Transplantation**

Split thickness graft is taken from donor site and incubated overnight. Next day the cells are mechanically separated using trypsin - EDTA solution and then centrifuged to prepare a suspension. This cell suspension is then applied to the abraded depigmented area and a collagen dressing is applied to keep it in place. A relatively large area of vitiligo about 10 times the size of donor graft can be taken care of with this procedure\(^6\). The recipient area however has to be treated with either NB_UVB or PUVA for 2 to 3 months to achieve the desired pigmentation.

10) **Smash Grafting**

This is a new technique developed in our department. In this graft is taken from donor site consist of only epidermis and kept in normal saline. This graft is then smash/ cut into small pieces and spread over manually over dermabraded vitiligo area. Dressing is done by soframycin tulle and removed after 7 days. This is followed by PUVA/puvasol or NB-UVB therapy. It gives good cosmetic results.

The site, duration, age, history of treatment taken are main factors, which make us decide which surgical technique is to be used. At times more than a combination of techniques used for good end point cosmetic results.

**References :**


