

Mid-dermis Grafting—A Clinical Study

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When disparity exists between the extent of the skin loss and the available donor sites from which grafts can be taken to cover it, it becomes advantageous to extend the yield potential of the donor area. By mid-dermis grafting technique the output of donor area can be doubled or sometimes even be tripled.

Material and Methods

This study was conducted on patients admitted to Plastic Surgery Department and other allied surgical units of Gandhi Memorial and Associated Hospitals, Lucknow. Patients requiring skin grafting for granulating wounds, secondary defects produced after elective plastic surgical procedures, burns or cases of crush injury resulting in skin loss were included.

Mid-dermis grafts were applied both with the external surface facing outwards and in reverse. Split skin grafts, were also applied on adjacent raw areas to serve as controls for the same patient. Histological studies of these grafts were done later.

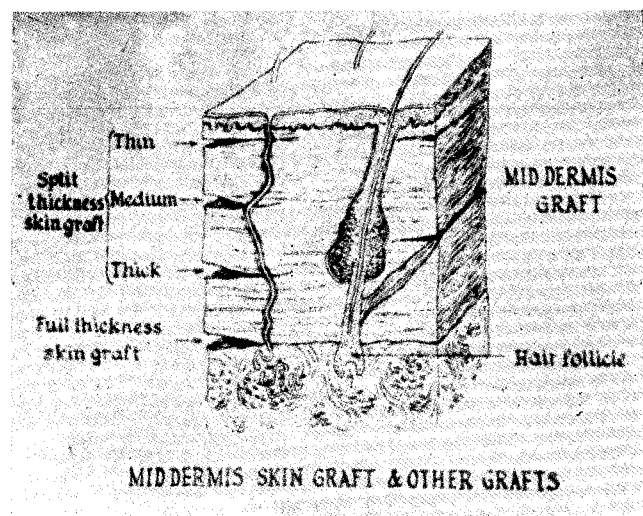
Operative Technique

Cutting of the Graft : Brown electric dermatome set at 10/1000" mark were used to cut sheets of thin split thickness skin

grafts. The donor area was covered with hot sponges to control the oozing. The dermatome was readjusted at 10-15/1000 of an inch and was operated once again over the same donor site, so as to collect a sheet of Mid-dermis graft (Fig 1).

Application of Graft

The raw areas were covered partly with skin grafts, and rest with mid-dermis grafts. The grafts were stitched, into position Mid-dermis grafts were applied both with their external surfaces facing outwards and some in reverse. Single layer paraffin guaze superimposed by wet and dry cotton wool formed



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the dressings. The operated part was suitably immobilized.

Categorisation of cases.

This study includes 22 patients who required skin coverage.

Nature of skin loss	No. of cases	Mid-dermis	Reversed Mid-dermis
(a) Traumatic skin loss	6	6	Nil
(b) Post burn skin loss			
(i) Immediate grafting	6	6	2
(ii) Delayed skin grafting	5	5	2
(c) Skin loss due to elective plastic surgical procedures.	5	5	5
Total	22	22	9

Figure 5 Shows the grafted area.

Results

In all 31 Mid-dermis grafts. (22 with external surface on top and 9 in reversed position) were applied. Total number of control grafts was 22.

Take up of Grafts :

Table 1 : Shows the Complete Take of Various Grafts.

Type of grafts	Total No. of cases	Complete take up	Percentage
Mid-dermis	22	9	40.9
Reversed Mid-dermis	9	5	55.5
Split Skin graft	22	11	50

Table 2 : Depicting the Incidence of Partial Take up.

Type of graft	Total No. of cases	Partial Take up	Percentage
Mid-dermis	22	9	40.9
Reversed Mid-dermis	9	1	11.1
Split Skin	22	9	40.9

Table 3 : Showing Incidence of Graft Rejection.

Type of graft	Total No. of cases	Rejection	Percentage
Mid-dermis	22	4	18.18
Reversed Mid-dermis	9	3	33.3
Split skin	22	2	9.09

Histology of Grafts :

A-Rejected Grafts. Figure 3 demonstrates the mid-dermis graft without any evidence of development of vascular connections. Inflammatory response is also minimal. Most probable cause in this patient was an ischaemic necrosis. While in another (figure 4) there is marked inflammatory response and at places there is abscess formation. Infection was the likely reason for rejection in this patient.

B - Accepted Grafts : After 6-8 days epidermis started appearing on the surface of many mid-dermis grafts, from the epithelial remnants of the skin i.e. hair follicles, sebaceous glands and sweat glands. At 10-15 days interval epidermis was found to be clearly differentiated. At 3 weeks the epidermis was almost normal looking (Figure 5).

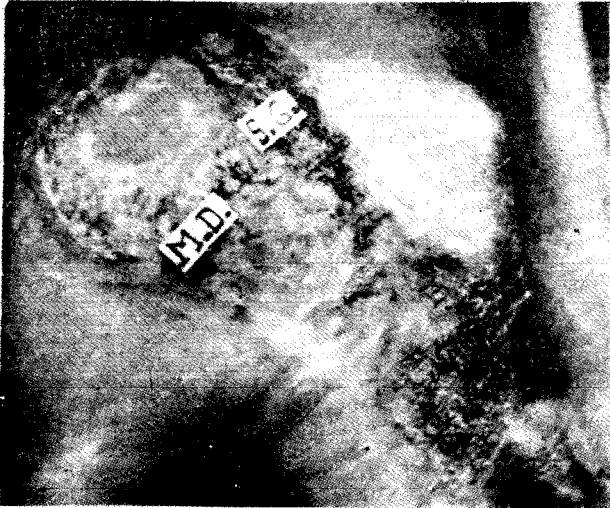


Fig. 2—Show the comparative contraction of Mid-dermis and split skin grafts

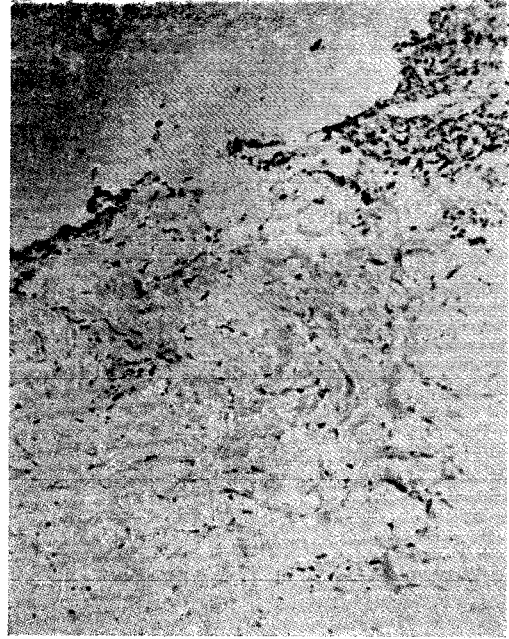


Fig 3—Avascular necrosis of Mid-dermis graft

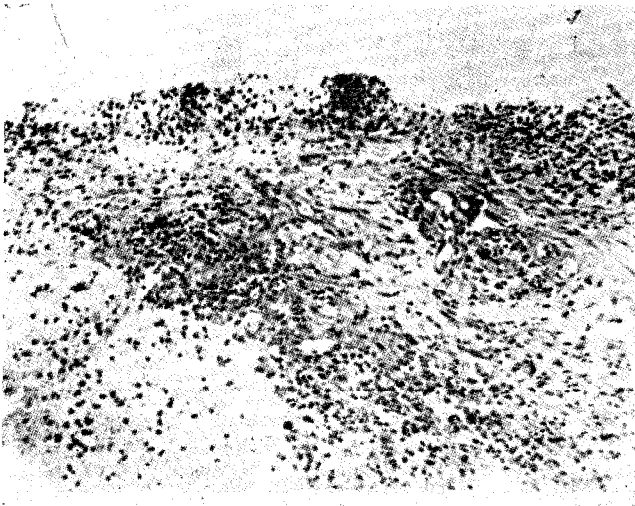


Fig. 4—Mid-dermis graft rejected due to infection



Fig. 5—Taken up Mid-dermis 2.8 weeks after, showing well formed epidermis

Contraction of the Grafts

Early onset of contraction was found in the control group of split skin grafts. Both the mid-dermis and reversed mid-dermis grafts showed less tendency to contract.

Hair Growth and Sensory Innervation

Nine weeks onwards many of the grafts had developed hair and sensation, which were more marked in case of mid-dermis grafts. The pain sensation was earliest to return (3-5 weeks). While touch and two points discrimination were found to return last (13-16 weeks). By the end of follow up as many as 22 mid-dermis grafts and 12 split grafts had developed sensory innervation.

Complications

Complications in the form of vesicles, bullae and scar formation were studied. Two cases of Mid-dermis grafts and 5 of split skin grafts had vesicle formation. Formation of scar at junctional lines was seen to occur more with mid-dermis grafts than with the split skin grafts. No keloidal tendency was found in any of the scars.

Discussion

There are innumerable reports of the successful subcutaneous dermal graft applications, which testify the ability of the dermis as free transplants. It has been used to repair hernial defects, tendons, ligaments and for building contours.

The surface applications have been sporadic. Zintel (1945) described the Mid-dermis graft as split skin graft. He carried out transplantation successfully and mention-

ed the possibility of these grafts being applied with either surface in contact with the wound.

Kubeck (1959) treated 17 cases of chronic ulcers with dermal grafts and he concluded that the results were better and permanent than with split skin grafts.

Yasui (1964) carried clinical trials with corium grafts of 0.3mm thickness which he obtained either by separating them from intermediate thickness skin grafts or by cutting them from fresh donor sites of split skin grafts with an electric dermatome. His observations were that the grafted area was more elastic than one covered with split skin and contraction was less.

Malherbe, et al (1971) used Mid-dermis grafting technique successfully for covering burn wounds where donor areas were limited.

The efficacy of Mid-dermis grafting had been studied in (under publication) experimental animals. The results were encouraging. It was then extended to human subjects.

None of the workers have given exact percentages of take up of these grafts. In the present series average take up of mid-dermis grafts was 35.8% while average take up in control group was 45.5%. Complete take up in reversed mid-dermis grafts was little better than mid-dermis with external side up.

Like Kubeck (1959) and Yasui (1964), in the present work also, it was found that mid-dermis graft had much less tendency to contract in comparison with split skin grafts.

Summary

Twenty two patients requiring skin coverage were subjected to mid-dermis grafting. Thirty one mid-dermis grafts were applied and all the patients had simultane-

ous controls provided by split skin grafts. Take up of grafts was reasonably good. Mid-dermis grafts were permanent, and more stable than split skin. The greatest advantage lay in doubling the donor site potential.

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