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Case Study

MANAGEMENT OF DIABETIC ULCER WITH COMPOSITE SKIN GRAFT - A CASE REPORT

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ABSTRACT:

Introduction: Surgery is one of the important branch of Ayurveda. Acharya Sushruta, the ancient Indian Surgeon is recognised as the father of plastic surgery. Sushruta made important contributions to the field of plastic surgery. Skin grafting is a surgical procedure that involves removing the skin from one area of the body and moving it, or transplanting it, to a different area of the body. Skin grafting is often used to treat extensive wounding caused by trauma, burn, necrotising fasciitis, after excising skin cancer etc. Also it helps to cover diabetic ulcer.

Case Presentation: An eighty five years male patient had come with non-healing ulcer at heel of right foot since two months. There was an ulcer with unhealthy granulation tissue with slough at its floor, edges were undermined, necrosed. Foul smell discharge was there.

Management and Outcome: The wound was debrided thoroughly. The edges were excised. All necrotic tissue was removed. So there was an extensive bare area, and to cover this raw area composite graft from sural area was used. This graft was selected along with skin and underling tissue allowing its vascular supply remained intact. It was sutured. To cover the raw area of this donor site split skin grafting was performed.

Discussion- This case report proved that to manage extensive wounding due to diabetes, when primary closure was contraindicated, skin grafting showed wound healing without any contracture under control of blood sugar.

KEY WORDS: Diabetic ulcers, Plastic surgery, Skin grafting, Necrotising Fasciitis, Skin Cancers, Debridement

INTRODUCTION:

Ayurveda has eight branches. Surgery is one of the important branches of Ayurveda. Acharya Sushruta, the ancient Indian Surgeon is recognised as the father of plastic surgery. Sushruta made important contributions to the field of plastic and cataract surgery. Since very ancient time in India, mutilation of the ears and nose are very common either by injuries from in wars or as a sort of punishment. Ears or nose are damaged completely or partially. It was the work of a surgeon to repair it. Sushruta was the first surgeon who performed these fabricated surgeries. He described fifteen types of procedures regarding joining of the mutilated ears. One of the methods, he described is as follows - cut out a flap of the living muscles from the cheek retaining its connection intact, Turn it over to the site of the lobe (damaged

part) after scrapping the area, make up the lobe. Sushruta also described the method of joining the mutilated nose - Nasa Sandhan (Rhinoplasty) as follows- A leaf of a tree should be taken, cut to shape of the nose. This is placed on the cheek and, then the cheek muscle is cut to the same size; raising a flap of it and maintaining the connection with live muscles, the flap is placed quickly on the mutilated nose, after scrapping it, then suitable bandage is tied. Inserting two tubes in the nose. After the union has healed, the flap of muscles should be cut at its half-length allowing the remainder intact. If the repaired nose is short, attempt should be made to augment its growth and if there is excess growth it should be made even. In the same manner he also described Ostha Sandhan joining of mutilated lips (Oroplasty). Sushruta's method of Rhinoplasty was adopted world over and popular as Indian rhinoplasty.

Skin grafting means the transplantation of skin. It is a surgical procedure that involves removing the skin from one area of the body and moving it, or transplanting it, to a different area of the body. The transplanted tissue is called a skin graft.

Skin grafting is often used to treat extensive wound caused by trauma, burns, extensive skin loss due to infection such as necrotising fasciitis. Specific surgeries - most commonly removal of skin cancer requires skin grafting. Surgical removal (excision or debridement) of the damaged skin requires skin grafting. A skin graft is used permanently to replace damaged missing skin or to provide a temporary wound covering. Skin is necessary because it protects the body against fluid loss, bacteria or virus invasion, and helps in temperature regulation. The grafting serves two purposes: reduce the course of treatment and enhances wound healing.

Sushruta also described contra indications for these surgeries, they should not be performed in case of vitiated blood, excessive haemorrhage, and absence of oozing. When blood is vitiated (impure) by Vata dosha then there are chances of cracks formation in skin, even after healing. Vitiated by Pitta there will be burning sensation, ulceration, redness and pain. Vitiated by Kapha, that area becomes static and there will be itching. When there is too much bleeding, then discoloration and swelling will develop and absence of blood discharge causes atrophy of muscle.

Types of Skin Grafts (According to thickness)

Partial or split-thickness skin graft (STSG) - more common. Also known as theirsch's graft. A split-thickness skin graft (STSG) includes the epidermis and part of the dermis. In this graft apertures are made which allows it to expand up to nine times. Split-thickness grafts are frequently used as they can cover large areas and the rate of auto rejection is low. The donor site heals by re-epithelialisation from the dermis and surrounding skin.

Full thickness skin graft - also known as Wolfe graft, involves pitching and cutting skin away from the donor section. A full-thickness skin graft consists of the epidermis and the entire thickness of the dermis. The donor site is either sutured directly or covered by a split - thickness skin graft. A full thickness skin graft is more risky, in terms of acceptation by recipient site, yet it leaves only a scar line on the donor section. For full thickness skin grafts, the donor section will often heal much more quickly than the injury and is less painful.

Composite graft - A composite graft is a small graft containing skin and underlying cartilage or other tissue.

Classification According To Donor -

- ***Autograft* -** The donor skin is taken from a different site on the same individual's body.
- ***Isograft* or *Syngraft*** - The donor and recipient individuals are genetically identical (e.g., monozygotic twins)

- **Xenograft or He*terograft* -** The donor and recipient are of different species (e.g., bovine cartilage). By definition, they are temporary biologic dressings which the body will reject afterwards. They are useful in reducing the bacterial concentration of an open wound, as well as reducing fluid loss.
- **Cell cultured epithelial autograft (CEA)** - skin cells are taken from the patient, in a laboratory new skin cells grow in sheets. These new sheets are used as grafts, chances of rejection are very less.

CASE STUDY REPORT

An eighty five years male patient had come with non-healing ulcer at right foot since two months. There was an ulcer with unhealthy granulation tissue with slough at its floor, edges were undermined, necrosed. Foul smell discharge was there. Wide local excision was done and to cover the raw area composite graft from Sural area was taken. To cover donor site split skin grafting was performed.

Aims & objectives

To study the role of skin grafting in extensive wounding due to debridement of Diabetic ulcer.

Type of study - Observational single case study without control group.

Study Centre- Ayurved Rugnalaya & Sterling Multi-Speciality Hospital attached to P.D.E.A.'s College of Ayurved & Research Centre, Nigdi, Pune.

STUDY DETAILS:

Age - 85 years Gender-male
Religion - Hindu Occupation - farmer
Diet -Vegetarian.

Chief complaints:

Non-healing ulcer at heel of right foot since two months. There was an ulcer with unhealthy granulation tissue with slough at its floor, edges were undermined, necrosed. Foul smell discharge was there.

Brief history:A small ulcer at right heel before two months, at pressure point. Patient had ignored it. Gradually this ulcer had been gone increasing. The ulcer captured whole heel. There was unhealthy granulation tissue with slough at its floor, edges were undermined & necrosed. Foul smell discharge was there. Ulcer was painful. Patient was diabetic with uncontrolled blood sugar.

Patient had taken medicine and wound dressing from general practioner but did not respond. So he came at Ayurvedic hospital for further management.

On examination: Cardiac, other systemic changes and general debility, so fitness form Cardiologist & Anesthiologist taken.

Family History: Not significant

Local examinations-

Site	- non-healing Painful ulcer at heel of right foot
Duration	- two months
Floor	- unhealthy granulation tissue with slough.
Edges	- undermined, necrosed
Discharge	- Profuse Sero - purulent
Shape	- irregular
Smell	- foul smell
Tenderness	- ++

Lab Reports –

HB%	- 10.8 gm.
Blood Urea	- 56 mg/dl
WBC	- 9,300 /Cu mm,
Sr.Creatinine	- 1.81mg/dl
BSL	- F: 210mg/dl & P.P.: 356mg/dl
Urine	- Sugar: ++++, Albumin: ++
X-Ray chest	- Cardiomegaly.
E.C.G.	- ischemic changes.

TREATMENT AND OUTCOME:

With the help of Plastic Surgeon under spinal anesthesia the ulcer was debrided thoroughly along with its edges and floor. And to cover the raw area composite graft from sural area of the same leg was used. This composite graft was selected along with skin and underling tissue allowing its vascular supply remained intact.

This composite graft was partially excised from donor area and rotated in such a manner that it covered the wound area, which was debrided; it was sutured with using stapler. The sural area of the same leg (donor area) was covered with split skin grafting. A thin layered partial thickness graft was taken from left thigh. It was split with multiple apertures, this split skin graft was sutured to previous donor area (lateral aspect of rt. thigh).The donor area of left thigh was dressed with framycetin tulle allowing to heal by re-epithelization. Right leg was dressed with framycetin tulle followed by plaster of Paris slab to maintain stability.

Patient had given IV antibiotic for five days. Along with oral Anti-inflammatory and antacids. The donor area of left thigh had created some degrees of pain, which was relieved by medicine. On fifth day dressing of recipient area was changed and observations noted. There were slightly discolored edges, small part was necrosed. This part was removed. Stitches are removed after 15 days .The donor site of partial thickness graft was dressed after 15 days which was completely healed. The slab was removed after 15 days. For diabetes control patient was shifted on inj. Insulin.

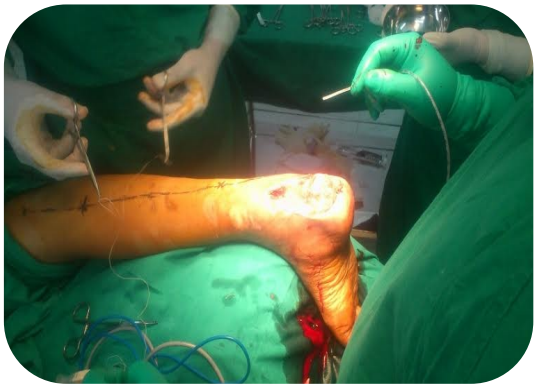
Treatment given:

Inj. Human Actrapid 12 to 15 units. TDS before meal. Doses were adjusted according to BSL.

It was continued up to wound healing.
Inj. Pan 40 mg I.V. 12 hourly for 5 days
Inj. Monocef 1gm I.V. 12 hourly for 5 days
Inj. Diclofenac 75 mg I.M. 8 hourly for 2 days.

Then Tab.Combiflam 1 T.D.S
Tab.Chymerol Forte 1 T.D.S.
Tab.Pan 40 mg O.D.
Tab.Cefakind 500 mg 1B.D.
(Oral Medicines given for 7 days.)

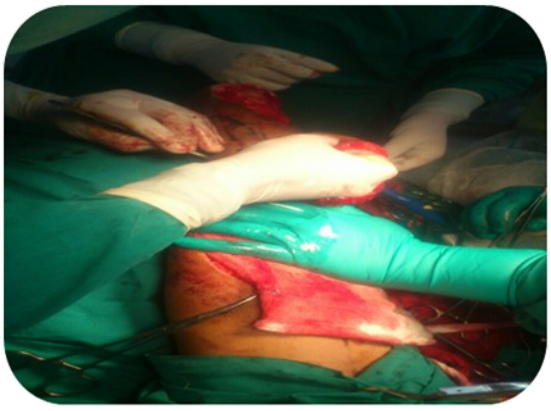
FIGURES-Showing various stages of skin grafting



Markings for composite graft

Incision taken on markings

A composite graft is taken from Sural area



Adjustment of composite graft

FIGURES - Showing various stages of skin grafting

Recipient area after composite graft

Taking partial thickness skin graft

Taking partial thickness skin graft

Raw area after partial thickness skin graft

Covering of Donor area by split partial thickness skin graft

wound during first dressing

OBSERVATIONS AND RESULT:

Gradation criteria for assessment of wound:

Parameters for assessment	**0**	+	+ +	+ + +
Pain	No	Mild pain during movement, no painkiller required	Moderate pain at rest, painkiller required	Sever pain which disturbs the sleep & sedatives required
Discharge	No	Mild serous dis-charge	Mild sero-purulent Discharge	Profuse purulent discharge
Indurations	No	localized	All over Around Wound	Widespread up to thigh
Discoloration	No	purple	greenish	Black
Fever	up to 98.6F	98.7 to100 F	100.1to 101 F	Above 101.1F
Edges	normal	Slightly discolored	Partially necrosed	Completely necrosed

Observations of prognosis of wound as per assessment criteria:

Criteria	**5th Day**	**After 1st week**	**After 2nd week**	**After 3rd week**
Pain	++	++	+	0
Discharge	+++	++	+	0
Indurations	++	++	+	+
Discoloration	++	++	+	0
Edges	++	++	+	0
Fever	+	0	0	0

RESULTS:

After excision of diabetic ulcer, wound healed within three weeks, without any contracture, with minimal scarring. Donor area of same thigh healed in three weeks. Donor area of left thigh healed in two weeks with discoloration. Donor area created some degree of pain which was relieved by medicine.

DISCUSSION:

At this case due to extensive skin loss primary wound closure was not possible. If we tried primary closure there would be great tension, the edges of wound could not come together. the raw area could get infected. Also there were chances of wound contracture., which could hamper the movements of right foot .To avoid all these possibilities, we had taken a decision of skin grafting. As there was extensive skin loss with underlying tissue we had taken a flap of skin with underlying tissue from adjacent area, which was rotated and sutured without disturbing its blood supply. It was very well accepted by the wound, it healed in three weeks without any contracture. Only suture line remained left.

As this graft was rotated, some raw area was left on donor site. For which partial thickness skin graft from other thigh was taken and used to cover the wound after expanding it by splitting. This graft was also very well accepted within 15 days. The wound of left thigh healed by re-epithelisation. It was painful but managed by oral treatment.

P.O.P. slab was applied as it protected recipient area from movement, so avoided displacement of graft and enhanced its acceptance.

Injectable Human Actrapid helped to control blood sugar, which helped to control spread of infection. Antibiotics helped to prevent infection. Anti-inflammatory drugs helped to reduce oedema and pain. Antacids avoided gastritis.

CONCLUSION:

This case report shows that extensive skin loss requires skin grafting to promote fast healing of wound and to avoid contracture. In diabetes also it helps in wound healing under control of blood sugar.

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