

Skin cover is still a better option in cases of chronic non healing wounds

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Abstract

Skin performs a multitude of specialized functions. Restoration of an intact barrier is of critical importance following wounding and may be achieved in numerous ways, including grafting. A study was conducted on 75 patients treated between 2001 and 2006. The aim was to evaluate the reduction in hospital stay and the percentage take of grafts, in patients with various types of wounds. Observations were tabulated and analyzed. Maximum wounds sustained were by patients in the age group of more than 60yrs (32%). Forty-five cases out of 75 (60%) showed graft acceptance of more than 75%. Majority of wound swabs from infected cases were positive for pseudomonas (29.33%).

Key Words: Burn, Wounds, Skin grafting, Infection.

Introduction

Skin covers the entire external surface of the human body.[1] The integumentary system is the principle interface with the surrounding world and, therefore performs a multitude of specialized functions. It serves as a protective barrier preventing internal tissues from being exposed to trauma, radiation, temperature changes and infection. Other important functions include thermo-regulation through sweating and vasoconstriction or vasodilatation, and control of insensible fluid loss.[2]

Skin grafting was being performed in India about 2000 years ago. George David Pollock, in May 1870, was the first to apply skin auto grafts to a burns patient.[3] Skin grafting is a combination of various surgical skills and techniques.[4]

The following varieties of defects were included in the study:

1. Chronic non-healing, non specific ulcers.
2. Traumatic ulcer and degloving injuries.
3. Venous ulcer., tropical ulcer, diabetic ulcer.
4. Burn wounds (where there is coagulative necrosis of tissues).[5]
5. Skin loss from surgically removed growths.

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Types of skin covers that were reviewed:

1. Free grafts: Full thickness: All epidermis and dermis.
2. Partial thickness: Skin harvested at some level within dermis.
3. Free flaps. Pedicle flaps, (1/1200 to 1/2000 of an inch).[6]

The cases were treated with wound dressings, debridement, release incisions in cases with compartment syndromes, antibiotics, analgesics and surgical intervention in cases of tumours. Control of diabetes played an important role in diabetic foot ulcers. After the wounds were found to be healthy, patients were posted for skin grafting. The purpose of this study was to determine post grafting outcome and rates of acceptance / rejection of grafts.

Material and Methods

The study was conducted on 75 patients in whom intervention had been carried out to achieve skin cover. The study period was between 2001 to 2006. It was conducted at Pravara Rural Hospital, Loni Maharashtra A proforma was designed. Demographic data was collected, presence of co-morbidities were noted, the characteristics and size of the wounds, the surgical procedures performed (if any), type of skin grafting carried out, length of hospital stay, acceptance rate of grafts were recorded during follow up. Statistical significances was later defined.

Observations and Results

1. Number of patients: Male: 43, Female: 32

2. Types of ulcers:

- (a) Chronic non-healing, non specific ulcers: 11
- (b) Traumatic ulcer: 15
- (c) Venous ulcer: 9
- (d) Tropical ulcer: 7
- (e) Diabetic ulcer: 9
- (f) Burn wounds: 18
- (g) Skin loss from surgically removed growth:6

3. Selection of grafts:

- (a) Partial thickness: Number of cases: 40
- (b) Full thickness: Number of cases: 27
- (c) Flap covers: Number of cases: 8

Table No. 1 Skin grafting carried out with regard to age and sex

| Age in years | Patients | | TOTAL | % |
|--------------|-------------|-------------|----------|-------|
| | Male | Female | | |
| 0 to 20 | 09 | 13 | 22 | 29.30 |
| 21 to 40 | 08 | 08 | 16 | 21.33 |
| 41 to 60 | 11 | 02 | 13 | 17.33 |
| >60 | 15 | 09 | 24 | 32.00 |
| Total | 43 (57.33%) | 32 (42.66%) | 75(100%) | 100% |

4. Factors associated with graft rejection:

- (a) Haematoma/seroma: Number of cases: 33
- (b) Infection: Number of cases: 22
- (c) Movement of graft: Number of cases: 5

5. Mean hospital stay:

- (a) Pre-graft: 25 days.
- (b) Post-graft: 10 days.

6. Acceptance of grafts:

- (a) 75% or more: 45 cases.
- (b) 50-75%: 25 cases.
- (c) Less than 50 %: 5 cases.

Table No. 2 Types of ulcer in relation to graft's take

| Types of ulcer | Percentage take | | |
|---------------------------|-----------------|-----------|-------|
| | > 75% | 50 to 75% | <50% |
| Chronic non healing | | | |
| Non specific ulcer | 6 | 4 | 1 |
| Traumatic ulcers | 12 | 3 | 0 |
| Venous ulcers | 4 | 5 | 0 |
| Trophic ulcers | 3 | 1 | 3 |
| Diabetic ulcers | 5 | 3 | 1 |
| Burn wounds | 11 | 7 | 0 |
| Skin loss from surgically | 4 | 2 | 0 |
| Removed growths | | | |
| Total | 45 | 25 | 05 |
| (%) | 60% | 33.33% | 6.66% |

Table No. 3 Would swab cultures

| Types of ulcer | Commonest Organisms | | | | |
|-----------------|---------------------|---------------|-------------|------------|------------------------------|
| | E.coli | Acenetobacter | Pseudomonas | Klebsiella | Staphylococcus/Streptococcus |
| Ch. Non healing | 2 | 1 | 1 | 5 | 2 |
| Traumatic ulcer | 2 | 0 | 1 | 3 | 4 |
| Venous ulcers | 2 | 0 | 1 | 1 | 5 |
| Trophic ulcers | 1 | 1 | 2 | 2 | 1 |
| Diabetic ulcers | 0 | 0 | 5 | 2 | 2 |
| Burn wounds | 0 | 0 | 12 | 3 | 3 |
| Skin loss from | 0 | 0 | 0 | 1 | 2 |
| Total | 7 | 2 | 22 | 17 | 19 |

Table No. 4 : Mean hospital stay

| Types of ulcer | Pre Graft | Post Graft | Total |
|---|----------------|----------------|----------------|
| Chronic non-healing Non specific ulcers | 28 | 12 | 40 |
| Traumatic ulcers | 22 | 8 | 30 |
| Venous ulcers | 21 | 7 | 28 |
| Trophic ulcers | 20 | 12 | 32 |
| Diabetic ulcers | 30 | 10 | 40 |
| Burn wounds | 20 | 8 | 23 |
| Skin loss from surgically Removed growths | - | 12 | 12 |
| Total | 25 Days | 10 Days | 30 Days |

Conclusion

The following points were noted.

1. Most common indication for grafting was burn wounds.
2. Traumatic and burn cases showed maximum acceptance of grafts due to less amount of infection and better wound preparations.
3. Wound swabs were positive for pseudomonas in majority of cases. This may be attributed to hospital acquired infection.
4. Graft take was poor among wounds infected with species of staphylococcus and streptococcus due to presence of collagenases and fibrinolysins in these organisms that reduce the take of grafts.
5. Immobilization showed better acceptance among the grafted wounds.
6. Haematoma and seroma formations may be due to insufficient mesh work.

7. Mean hospital stay of the patients was reduced after skin grafting.

Precautions suggested for prevention of graft failures:

1. Proper control of infections, early debridement and diabetes control, especially among elderly patients.
2. Regular wound swab cultures and administration of antibiotics according to the sensitivities.
3. Proper operative techniques for grafting with post-operative immobilization.
4. Patient education on how to avoid graft failures and how to avoid ulcers in general.

Our biologic understanding of grafted skin is well developed, yet our ability to apply that knowledge to patients is still limited. Current research in molecular biology, wound healing and immunology is likely to yield better skin substitutes to treat patients. A time can be envisioned when a synthetic bilayer membrane like the skin will be available off the shelf for application like a dressing change.

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