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Case Report

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Skin Grafting in the Treatment of Skin Loss in Dismembered Patients: Experience with 30 Cases in the Orthopedics and Traumatology Department of Ignace Deen National Hospital

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ABSTRACT

Introduction: The objective of our study was to describe the management of extensive skin loss.

Materials and Methods: This was a prospective, single-center, descriptive study lasting 24 months, from September 30, 2012, to September 30, 2014, involving 30 patients.

Results: During the study period, we collected data on 2,645 hospitalizations involving 42 patients admitted for skin loss, including 30 cases of skin grafting, representing a hospital frequency of 1.14%. The most affected age groups were those aged 47-56 and 57 and over, accounting for 23.33% each; the average age was 26, with extremes ranging from 6 to 74. Skin grafts were performed on both sexes, with a predominance of males (60%) compared to females (40%), with a sex ratio of 1.5. Workers constituted the most affected socio-professional group with 26.66%, followed by pupils and students with 20%. Trauma and infections were the most frequent causes, accounting for 67% and 23% respectively. Most of the injuries observed had a recent admission time of less than one month, i.e., 46.66%, with extremes ranging from one to 12 months.

Skin grafts were performed on the leg in 46.66% of cases, followed by the foot in 20% of cases. In terms of underlying conditions, half of the patients had no particular medical condition. However, 20% of patients were hypertensive, while diabetes and sickle cell disease each accounted for 15%. The most common lesions had an estimated surface area of 20/6 cm.

Conclusion: Skin loss in the limbs is increasing significantly in our societies due to the nature of the lesions caused by trauma and/or the occurrence of infection during initial treatment. Skin grafting is an alternative for rapid healing of these lesions. However, failures are not uncommon when therapeutic indications and rigorous asepsis are not respected.

Keywords: Cutaneous, Graft, Skin Loss, Substance, Treatment

Introduction

A skin graft is a piece of skin of varying thickness, free of any vascular connection, separated from its donor site and then transferred to the recipient site, which is the area of tissue loss to be repaired [1]. Thin skin grafting is one of the basic surgical techniques used in plastic surgery to cover tissue loss, especially in burn victims [2]. Unlike a flap, which contains its own vascularization, a graft only survives if it is revascularized by the tissues to which it is attached [3]. The history of skin grafts began in Europe at the end of the 19th century [4, 5].

Reverdin: pellet grafts (1869).

Lawson

The first full-thickness skin grafts (1870). He noted that for the

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graft to take, it must be stripped of its subcutaneous fat, placed on a healthy bud, and firmly applied to it.

Ollier
The first "dermoepidermal" grafts (1872). He emphasized the need to graft onto healthy granulation tissue.

When repairing tissue loss, the simplest techniques should always be considered before moving on to more complicated ones. Skin grafting is therefore one of the simpler therapeutic options, but it remains a method whose details of implementation make it a true surgical technique [6, 7]. Whether it is a full-thickness skin graft or a thin-layer skin graft, the benefit to the patient remains irreplaceable [8]. The aim of our work was to describe the management of extensive skin loss.

Materials and Methods
This was a prospective, single-center, descriptive study lasting 24 months, from September 30, 2012, to September 30, 2014, involving 30 patients.

Inclusion Criteria
All patients admitted for loss of skin substance in the limbs, who underwent skin grafting and were followed up in the department.

Exclusion Criteria
Patients admitted for traumatic wounds with loss of skin substance located outside the limbs, traumatic wounds of the limbs that required guided healing without skin grafting.

Data Management and Aanalysis
Our data were entered using Word 2016 software and analyzed twice using EpiData 3.1 software and then SPSS 21 software. The variables were presented as proportions (estimated as percentages) or means with standard deviations (SD).

Ethical Considerations
The study protocol was approved by the National Ethics Committee for Health Research in Guinea (No. 08/CNERS/17). Free and informed consent, both verbal and written, was obtained from the patient. The information collected was anonymous and was coded before being analyzed.

Results
During the study period, we collected data on 2,645 hospitalizations involving 42 patients admitted for skin loss, including 30 cases of skin grafting, representing a hospital frequency of 1.14%.

The most affected age groups were those aged 47-56 and 57 and over, accounting for 23.33% of cases; the average age was 26, with extremes ranging from 6 to 74 years. Skin grafts were performed on both sexes, with a predominance of males (60%) compared to females (40%), with a sex ratio of 1.5. Manual workers constituted the most affected socio-professional group (26.66%), followed by pupils and students (20%).

Table 1: Distribution of Patients According to Sociodemographic Strata

Sociodemographic characteristics	Number of cases N = 30	Percentage (%)
AGE (In years)		
<17	2	6.67
17-26	4	13.33
27-36	4	13.33
37-46	6	20.00
47-56	7	23.33
>56	7	23.33
GENDER		
Male	18	60.00
Féminine	12	40.00
PROFESSION		
Civil servant	3	10.00
Merchant	4	13.33
Housekeeper	3	10.00
Workers	8	26.67
Pupil/student	6	20.00
Driver	2	6.67
Cultivator	4	13.33

Trauma and infections were the most common causes, accounting for 67% and 23% of cases, respectively. Most of the lesions observed had a recent admission time of less than 1 month, i.e., 46.66%, with extremes ranging from 1 to 12 months. Skin grafts were performed on the leg in 46.66% of cases, followed by the foot in 20% of cases.

In terms of underlying conditions, half of the patients had no particular medical condition. However, 20% of patients were hypertensive, while diabetes and sickle cell disease each accounted for 15%. The most common lesions had an estimated surface area of 20/6 cm.

Discussion
During the study period, we collected 30 cases of skin grafts, representing a hospital frequency of 1.14%. Bellidenty L et al. reported 86 patients treated between 1978 and 2013 in 2014 [9].

The average age of our patients was 26, ranging from 6 to 74, which is close to the series by Bensassi A et al. who reported an average age of 29, ranging from 15 to 55 [10]. In contrast, Chesnier I et al. reported an average age of 38 years, with extremes of 16 and 91 years [11]. This predominance of substance loss in young adults can be explained by the fact that this is the most active segment of the population.

We recorded a male predominance with a sex ratio of 1.5. Similarly, Chesnier I et al. reported a male predominance with a sex ratio of 2.2 [11]. This contrasts with Bellidenty L et al. who recorded a female predominance with a female/male sex ratio of 9.5 [9]. The male predominance in our series could be explained by the fact that men are increasingly involved in daily activities and are therefore more exposed to accidents that cause skin loss.

Table 2: Distribution of Patients According to Characteristics of Skin Loss

Characteristics of substance loss	Number of cases N = 30	Percentage (%)
ETIOLOGY		
Trauma	20	66.67
Vascular	3	10.00
Infection	7	23.33
EVOLUTION		
<1 month	16	53.33
1 à 6 months	6	20.00
6 à 12 months	4	13.33
>12 months	4	13.33
SITE OF THE LESION		
Leg	14	46.67
Feet	7	23.33
Ankle	5	16.67
Knee	3	10.00
Thigh	1	3.33
UNDERLYING CONDITIONS		
None	15	50.00
Diabetes	5	16.67
High blood pressure	6	20.00
Sickle cell disease	4	13.33
EXTENT OF INJURIES		
Small area	5	16.67
Medium area	7	23.33
Large area	18	60.00

Table 3: Distribution of Patients According to Type of Transplant

Type of transplant	Workforce	Percentage (%)
Thin skin graft	26	86.67
Fasciocutaneous flap	4	13.33
Total	30	100

Trauma and infections were the most common causes, accounting for 67% and 23% of cases, respectively. Our results are comparable to those of Maruccia M et al., who reported chronic vascular wounds in 65.22% of cases and post-traumatic ulcers in 34.78% of cases [12]. Bensassi A et al. found post-traumatic causes in 77.77% of road accident cases [11]. Chesnier I et al [10]. reported that the origin of tissue loss was mainly traumatic, with 65 cases including 5 cases of burns, followed by surgical resections for tumor causes in 34 cases, arteriopathy and diabetes in 30 cases, and osteomyelitis in 23 cases. Driver indiscipline and the state of the roads in Guinea would explain the predominance of trauma.

In our series, most of the injuries observed had a recent admission time of less than 1 month, i.e., 46.66%, with extremes of 1 to 12 months. In the series by Laporte J et al. all patients included had a wound that had been evolving for more than 45 days (average of 66.9 months, median of 8 months) [13]. Bensassi A et al. found in their series that the time between the initial injury and the graft was extremely variable, ranging from 1 to 8 weeks [10].

In our series, skin grafts were performed on the leg in 46.66% of cases, followed by the foot in 20% of cases. These results are similar to those found in the literature [9, 11, 13]. This result in our series can be explained by the fact that the leg remains the area most exposed to trauma and vascular disorders. Depending on the terrain, 20% of patients in our series were hypertensive; diabetes and sickle cell disease each accounted for 15%.

The most frequent lesions had an estimated coverage area of 20/6 cm. This result could be explained by the fact that skin grafting remains the best alternative for rapid healing of these lesions.

Thin-skin autografts were the most commonly used technique, followed by flap grafts, accounting for 86.66% and 13.33% of cases, respectively. This result in our series is thought to be due to the severity of the lesions and the ease of performing each surgical technique.

Based on the percentage of grafted surface area, we recorded 15 patients who benefited from 100% grafted surface area coverage for thin skin grafts and 2 patients for fasciocutaneous flap grafts; 10 patients benefited from 95% grafted surface coverage for thin skin grafting and 1 patient for fasciocutaneous flap grafting; 1 patient benefited from 80% skin surface coverage for thin skin grafting and 1 patient for fasciocutaneous flap grafting.

This high rate of total graft coverage was due to the condition of the recipient site and the grafting technique used.

During the First Dressing Change:

- 15 patients had 100% graft coverage for skin grafts thin and 2 patients for fasciocutaneous flap skin grafting.
- 10 patients had 90% graft survival for thin skin grafting and 1 patient for fasciocutaneous flap skin grafting.
- One patient had 80% graft survival for thin skin grafts and one patient for fasciocutaneous flap grafts.

This high graft survival rate was due to the condition of the recipient site. At a mean follow-up of 23 months, our patients were evaluated and we obtained the following

Results

93.33% total healing, 3.33% partial healing, and 6.66% healing failure. In the series by Laporte J et al. [13], coverage failure was observed in 19 patients (20.8%), requiring a second coverage procedure immediately or at a later date.

Partial healing in our series was due to graft superinfection and edema. However, these cases of failure observed in our series could be explained by the age of the lesions, infection, and the underlying condition leading to total necrosis of the graft or its rejection.

Conclusion

Loss of skin substance in the limbs is clearly on the rise in our societies due to the nature of the injuries caused by trauma and/or the occurrence of infection during initial treatment. Skin grafting is an alternative for rapid healing of these injuries. However,

failures are not uncommon when therapeutic indications and strict aseptic technique are not followed.

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