

# Early Excision and Grafting versus Delayed Skin Grafting in Extensive Burn Patients: A Retrospective Study at the National Burn Center in Morocco

## ABSTRACT

Severe burns pose significant challenges to patients and healthcare providers due to their high mortality rate and prolonged hospital stay. This article aims to investigate the effects of early excision and skin grafting compared to conservative management with delayed skin grafting on reducing mortality and hospitalization duration.

We conducted a retrospective study to evaluate the outcomes of acute burn patients with extensive burns admitted to the National Burn Center in Morocco from January 2017 to December 2022, with a total body surface area (TBSA) of a burn between 10% to 60%.

The findings suggest that early excision and skin grafting significantly decrease the mortality rate and hospital stay in extensive burn patients. However, careful patient selection, meticulous surgical techniques, and appropriate postoperative care remain crucial for achieving optimal outcomes.

Keywords: burn management, early excision, severe burns, skin grafting.

## I. INTRODUCTION

Burns continue to be a major cause of morbidity and mortality worldwide [1]. Extensive burns, characterized by a large total body surface area (TBSA) involvement, present significant challenges in terms of wound management and patient care. Early excision and skin grafting have emerged as potential strategies to improve outcomes in these patients [2,3].

This article aims to assess the impact of early excision and skin grafting on reducing the mortality rate and hospital stay in extensive burn patients. The primary outcome was the mortality rate, and the secondary outcome was hospital stay.

## II. MATERIALS ET METHODS

We conducted a retrospective study to evaluate the outcomes of acute burn patients admitted to the National Burn Center in Morocco from January 2017 to December 2022 with a total body surface area (TBSA) of a burn between 10% to 60%. We excluded patients with chemical burns, electrical burns, polytrauma, a TBSA of a burn less than 10% or more than 60%, and patients with respiratory burns.

Patients were divided into two groups: those who underwent early excision and skin grafting (Group 1, n = 396) and those who were treated with conservative burn management (Group 2, n = 633).

## III. RESULTS

The mean age of the patients was 29.1 years in Group 1 (4 months – 94 years old) and 31.1 years in Group 2 (5 months – 98 years old). In Group 1, 67.8% were male, and in Group 2, 69.2% were male. The average total body surface area (TBSA) of a burn was 37.4% (range: 10-60%) in Group 1 and 39.7% in Group 2 (range: 10-60%).

The mortality rate was 25.6% in the early excision and skin grafting group and 30.8% in the conservative burn management group. The median hospital stay was 10.2 days (range: 1-54) in the early excision and skin grafting group and 16.4 days (range: 1-74) in the conservative burn management group.

The comparison between the two groups is statistically significant. The p-value for the difference in the mortality rate between the two groups was 0.03, and the p-value for the difference in hospital stay between the two groups was 0.002. Both of these differences are statistically significant, with p-values less than 0.05.

In other words, the results of our study suggest that early excision and skin grafting are associated with a lower mortality rate and shorter hospital stay than conservative burn management in patients with extensive burns.

## DISCUSSION

These findings strongly support the use of early excision and skin grafting as the standard of care for extensive burns. While the difference in mortality rate between the two groups was relatively small, it was statistically significant. This suggests that early excision and skin grafting may have a small but crucial impact on mortality rates in patients with extensive burns.

Moreover, the disparity in hospital stay duration between the two groups was more pronounced. Patients who underwent early excision and skin grafting were discharged from the hospital, on average, 6.2 days earlier than patients treated with conservative burn management. This underscores the significant potential of early excision and skin grafting to substantially reduce hospitalization periods.

Several factors contribute to the improved outcomes associated with early excision and skin grafting. Firstly, this approach effectively removes burned tissue, reducing the risk of infection and sepsis. Secondly, it provides a protective barrier against infection and helps regulate the body's temperature [4]. Lastly, early excision and skin grafting enable early mobilization and rehabilitation, further enhancing overall outcomes.

Despite the limitations of our retrospective study, such as the inability to randomize patients into treatment groups, the evidence strongly supports early excision and skin grafting as an effective treatment for extensive burns. It is linked to lower mortality rates, shorter hospital stays, and improved overall outcomes.

However, it's crucial to emphasize the importance of patient selection since not all extensive burn patients are suitable candidates for early excision and skin grafting. Factors affecting this decision include burn severity, the patient's overall health, and resource availability [2,3].

In conclusion, our study unequivocally demonstrates that early excision and skin grafting are linked to lower mortality rates and shorter hospital stays compared to conservative burn management in extensive burn patients. These findings reinforce the notion that early excision and skin grafting should be considered the standard of care for extensive burns.

Following Janzekovic et al.'s successful report of tangential burn wound excision with immediate grafting in 1970 [5], several guidelines have recommended early excision and grafting for treating limited full-thickness burns [6-8]. Nevertheless, this approach carries some risks, including deterioration of the patient's general condition and complications due to its invasiveness [9,10]. As a result, the universal acceptance of early excision for burn injuries exceeding 30% TBSA in adults remains a subject of debate [4].

Other studies further support our findings that early excision and skin grafting are associated with lower mortality rates and shorter hospital stays than conservative burn management [11-14].

Additionally, early excision and skin grafting are linked to a reduced risk of infection and sepsis by effectively removing burned tissue, which can be a breeding ground for infection and sepsis. Moreover, it provides a protective skin barrier against infection and helps maintain the body's temperature.

Furthermore, numerous studies advocate that early excision and skin grafting result in better overall outcomes and an improved quality of life [11,15-20].

Collectively, these findings from multiple studies unequivocally support early excision and skin grafting as the preferred treatment for extensive burns. This approach is linked to:

- Lower mortality rates, thereby reducing the risk of wound infection, sepsis, and multi-organ dysfunction syndrome [11-14]. The removal of necrotic tissue and the application of autografts promote wound healing, reduce fluid and electrolyte losses, and prevent systemic complications [4].
- Shorter hospital stays, achieved through the removal of necrotic tissue and wound closure, enabling early initiation of rehabilitation and functional recovery. The reduced risk of wound infection and subsequent complications contributes to shorter hospitalization periods [1, 2, 9]. Additionally, early excision and skin grafting can free up burn unit beds for other patients in need [11,15-20].

#### IV. CONCLUSION

Our study found that early excision and skin grafting were associated with a lower mortality rate and shorter hospital stay than conservative burn management in patients with extensive burns.

These findings strongly support the use of early excision and skin grafting as the standard of care for extensive burns.

#### **Consent**

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

#### **Ethical Approval:**

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

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