

RESEARCH ARTICLE

Use of Suprathel for Deep Dermal Burns: Our Clinical Experience

Emin Yilmaz,¹ Emre Simsek,¹ Alparslan Ertenlice,² Ali Emre Akgun,¹ Merve Akin¹

¹Department Of General Surgery, Ankara Bilkent City Hospital, Ankara, Türkiye

²Department Of General Surgery, Ankara Yıldırım Beyazıt University, Ankara, Türkiye

Abstract

Article Info

Received Date: 11.07.2025

Revision Date : 30.08.2025

Accepted Date: 13.09.2025

Keywords:

Suprathel,
Deep Dermal Burns,
Epithelialization Time

ORCIDs of the authors:

EY :0009-0000-2835-647X

ES :0000-0002-2253-5992

AE :0000-0002-8227-5328

AEA :0000-0002-0389-4922

MA :0000-0001-7224-4774

Introduction: Standard treatment includes immediate debridement of non-viable tissue and closure of the wound with dressings that provide favorable conditions for reepithelialization. Since superficial and deep areas may coexist in second-degree burns, the choice of dressing is also very important in second-degree burns.

The aim of this retrospective study was to summarize our experience with Suprathel® in the Burn Center and to examine the contribution of Suprathel® to wound healing in heterogeneous second-degree burns.

Methods: : Patients with superficial and deep second-degree burns hospitalized in Ankara City Hospital Burn Treatment Center between April 1, 2019 and December 31, 2020 were retrospectively analyzed. Age, gender, burn etiology, total burn surface area(TBSA), depth of injury were recorded. Patients were grouped according to dressing options or treatment regimen with Suprathel. Epithelialization time, skin grafting time, if performed, and graft harvest rates were compared within groups.

Results: Of 130 patients hospitalized for second-degree burns (deep dermal burns), 58 were closed with Suprathel®. 43 of the patients who did not receive Suprathel underwent a graft operation. Eight patients underwent grafting after Suprathel application. The remaining 29 patients underwent escharectomy and conventional dressing methods.

Conclusion: When the patient groups with and without Suprathel application were compared, there was no significant difference in terms of gender, burn etiology and burn localization. However, there were younger patients in the suprathel group. Epithelialization time was shorter and graft acceptance was higher in suprathel treated patients.

When the total burned body surface areas were compared according to the treatment methods applied, it was observed that the burn area requiring graft was significantly smaller in suprathel treated patients.

Correspondence Address: Üniversiteler Mahallesi 1604. Cadde No: 9 Çankaya Ankara - Türkiye
Phone: +90 544 209 20 17 / **e-mail:** eminyilmaz10@hotmail.com

Copyright© 2025. Yilmaz et al. This article is distributed under a Creative Commons Attribution 4.0 International License.



Follow this and additional works at: <https://achmedicaljournal.com>

Introduction

Burns are a worldwide public health concern, causing mortality and morbidity.¹ The result of burn trauma is the loss of the barrier between the external environment and the body: Skin. Loss of the epidermal barrier has serious adverse physiologic effects. Direct and evaporative fluid losses are immediately seen. If wounds are large, this quickly leads to dehydration and shock.² Moreover, injuries due to burns are associated with extreme pain and suffering that can impair a patient's quality of life.³ Standard treatment involves immediate debridement of nonviable tissue and coverage of the wound with dressings that provide favorable conditions for reepithelialization, prevent excess amount of fluid, mitigates the risk of infection, easy to use, and controls pain.⁴

Depending on its duration and intensity, the thermal insult can affect both the epidermal and dermal layers of the skin.^{5,6} Following a burn, necrosis occurs at the center of the injury and becomes progressively less severe at the periphery. Jackson's description in 1953 of the three zones of injury remains our conceptual understanding of heterogeneous burn wound.⁷ Therefore choosing the best dressing is challenging for clinicians that the dressing applied to wound should be proper for all Jackson's zones. Since superficial and deep areas may present together in second degree burns, the choice of dressing is very important in second degree burns either.

One of such dressings which display the properties of the natural epithelium is Suprathel® (PolyMedics Innovations GmbH, Germany). This is an absorbable new-generation dressing based on a co-polymer of three compounds: DL-lactide, trimethylene carbonate and ϵ -caprolactone.⁸ The specific structure and chemical composition of the dressing guarantee its elasticity, water permeability, transparency after application to the wound and biodegradability. It has been successfully used in superficial, mixed, and deep partial-thickness burns in adult and pediatric patients.⁹

The goal of this retrospective study summarize our experiences at Burn Center with Suprathel® and contribution of Suprathel® to wound healing in heterogeneous second-degree burns was examined.

Material and Methods

The records of patients with superficial and deep second-degree burns who were hospitalized in Ankara City Hospital Burn Treatment Center between April 1, 2019 and December 31, 2020 were analyzed

retrospectively. Age, gender, burn etiology, total burn surface area (TBSA), depth of injury were recorded. Patients were grouped according to the treatment regimen whether conventional dressing options or Suprathel application were done. Epithelialization time, time of skin grafting if done and graft take rates compared within the groups. This retrospective observational study was approved by the local Institutional Review Board (IRB) (E.Kurul-E1-20-1175/25/11/2020).

Statistical Analysis

Descriptive and demographic data were analysed with ratios and means. Groups were compared with chi-square test and p-value has accepted significant when higher than 0.05.

Suprathel® Application

After admission of patients to the burn ward within 24-48 hours of injury, escharectomy and debridement performed under sedation or general anesthesia in the operating room. Sharp debridement was performed to all patients until hemorrhagic vital wound bed occur. Hydrosurgery (VersaJet®) also used when required. Thereafter, a Suprathel® film was cut to adequate dimensions to cover the complete burned area and fixed with staples. Single layer of gauze and a surgical elastic net bandage applied upon the Suprathel® sheet. Patients advised to keep the wound area dry and dressing change didn't performed. The wound followed-up until the Suprathel® gets transparent and start to getting pilled-off. If the Suprathel® was completely detached from the unhealed wound bed, it has removed and decision made for whether reapplication of Suprathel® indicated, or skin grafting needed or not. Other patients who did not undergo suprathel application were dressed with silver cream or paraffin sponge.

Usability of Suprathel® was evaluated by its adherence to the wound bed. Effectiveness of Suprathel® was evaluated in terms of epithelialization time and need for further applications. Epithelialization time was defined as the number of days until at least 95 % epithelialization of the wound, judged by an experienced burn surgeon. The number of burn wounds that were treated with Suprathel® and required secondary (surgical) intervention were also determined.

Results

During the study period total 130 patients hospitalized for their second-degree (derin dermal yanıklar) burn.. Of those patients, 58 of them covered with Suprathel®. Graft operation was performed in

43 of the patients without supraphel. Eight patients underwent grafting after Supratel application. The remaining 29 patients underwent escharectomy and conventional dressing (antibiotic impregnated sponge, paraffin impregnated gauze dressing, silver wound dressing). The mean age of the patients was 40.1 years (18-93). 78 of the patient were male and 52 of them were female. Patients mean total burned surface area were 8.02% (1%-70%), where mean Supraphel applied TBSA was 6.62 %(1%-30%) (p=0,000). Sixty-nine (53.1%) of the patients burned hot liquid (scalding). Most of the wounds were localized at lower limb (46.2%), and followed by upper limb and hand (27.7% and 12,3% respectively) (Figure 1).

Figure 1: Clinical and Demographic Characteristics of Patients

Patient Count, N	130
Gender	
Female	52
Male	78
Age, average	40,1 (18-93)
TBSA, average%	%8,02 (%1-%70)
Burn Etiology,n(%)	
Hot Liquid	69 (53,1)
Flame	38 (29,2)
Chemical	10 (7,7)
Contact	10 (7,7)
Electrical	3 (2,3)
Burn Location	
Lower Extremity	60 (46,2)
Upper Extremity	36 (27,7)
Hand	16 (12,3)
Trunk	11 (8,5)
Face	7 (5,4)
Burn Depth	
Superficial Dermal Burns	60 (46,2)
Deep Dermal Burns	70 (53,8)
Operation	
Escharotomy	12 (9,2)
Convantional Dressing	17(13,1)
Supraphel	58 (44,6)
Graft	51
Epithelialization Time	
Escharotomy + Conventional Dressing	16,06 gün
Supraphel	17,34 gün
Graft	23,16 gün
Supraphel + Graft	23,12 gün

When the patient groups with and without supraphel application were compared, there was no sig-

nificant difference in terms of gender, burn etiology and burn localization. However, there were younger patients in the supraphel group. Epithelialization time was shorter and graft acceptance was higher in patients treated with supraphel(p=0,021, p=0,000) (Figure 2)

Figure 2: Characteristics of Patient Groups With and Without Supraphel Application

	Supraphel Not Applied	Supraphel Applied	P-value
Gender			0,51
Female	27	25	
Male	45	33	
Age, average	43,04	36,6	0,025
TBSA %, average	%5,12	%6,62	0,000
Burn Etiology,n(%)			0,98
Hot Liquid	39(56,5)	30(43,5)	
Flame	16 (42,1)	22 (57,9)	
Chemical	6 (60,0)	4 (40,0)	
Contact	9 (90,0)	1 (10,0)	
Electrical	2 (66,7)	1(33,3)	
Burn Localization			0,11
Lower Extremity	40(66,7)	20(33,3)	
Upper Extremity	15 (41,7)	21 (58,3)	
Hand	9 (56,3)	3 (43,8)	
Trunk	4 (36,4)	7 (63,6)	
Face	4 (57,1)	3 (42,9)	
Graft Lysis			0,000
Positive	2	-	
Epithelialization Time	23,16 days	18,14 days	0,021

When the total burned body surface areas were compared according to the applied treatment methods, it was observed that the burn area requiring graft was significantly reduced in patients who were applied Supraphel(Figure 3).

Figure 3: Total Body Surface Area(TBSA) Changes According to Treatment

	Patient Count	TBSA(%)	P-value
All Patients	130	8,02	0,000
Conventional Methods	29	6,28	0,000
Supraphel Application	58	6,62	0,000
Graft Application	43	5,12	0,000
Graft Application after Supraphel	8	3,38	0,000

Discussion

In burn wounds where the dermis is affected, wound healing is directly related to the amount of dermis affected. Management of burn areas with combined superficial and deep dermal damage is challenging for burn surgeons. If deeply burned areas

are considered superficial and epithelialization is waited with conventional treatment methods, this may cause delays that may lead to loss of function, especially in areas where functional integrity is important, such as the hands and face. In this study, it was observed that the use of Suprathel in burn wounds with superficial and deep dermal damage together made the deep burn areas that may need grafts ready for graft application in a shorter time compared to the use of conventional wound closure methods and even epithelialized in a shorter time compared to patients who received autograft without using an epidermis skeleton. In this type of burns, the use of an epidermal scaffold makes the wound bed suitable for graft application in full-thickness burn areas, thus reducing the epithelialization time. It has also been shown to provide a significant reduction in the size of the burned area that needs to be transplanted (Figure 3).

Underestimation of deep areas may result in loss of function in functional areas. In this case, by using Suprathel, even if there is no epithelialization in the deep areas, the superficial area of the burn area becomes epithelialized in the time required for Suprathel application, while the deep area becomes ready for grafting and the total repithelialization time does not change.

It is thought that especially in large surface area burns, suprathelin can be applied after effective escharectomy of the burn area even if there is a full-thickness burn in a part of the wound. Wound healing is accelerated thanks to the moist environment provided by Suprathelin in the wound and the local ischemia warning of the lactic acid it contains. The fact that there was no significant difference in the epithelialization time between patients who received grafts using conventional methods and those who received Suprathel (16.06 and 17.34 days) suggests that Suprathel can be used for early wound closure in deep dermal burns and even in mixed depth burns including full-thickness burn areas.



Limitations

In this study there were not follow-up visits for the patients. Also the number of the groups were limited and the study was retrospective. To discuss the effectiveness of Suprathel on mixed degree burns and scar appearance further prospective randomized studies should be performed.

References

1. World Health Organization. Burns. 2018. <https://tinyurl.com/y2pt6u5n> (accessed 26 November 2020)
2. Skin Substitutes and 'the next level'; Esther Middelkoop, Robert L. Sheridan Total Burn Care, 15, 167-173.e2
3. Rahimi F, Rezayatmand R. Use of a biosynthetic wound dressing to treat burns: a systematic review. *J Wound Care*. 2020 Dec 1;29(Sup12):S16-S22. doi: 10.12968/jowc.2020.29.Sup12.S16. PMID: 33320760.
4. Hundeshagen G, Collins VN, Wurzer P, Sherman W, Voigt CD, Cambiaso-Daniel J, Nunez Lopez O, Sheaffer J, Herndon DN, Finnerty CC, Branski LK. A Prospective, Randomized, Controlled Trial Comparing the Outpatient Treatment of Pediatric and Adult Partial-Thickness Burns with Suprathel or Mepilex Ag. *J Burn Care Res*. 2018 Feb 20;39(2):261-267. doi: 10.1097/BCR.0000000000000584. PMID: 28557869; PMCID: PMC5700875.
5. Lewis GM, Heimbach DM, Gibran NS. Evaluation of the burn wound: management decisions. In: Herndon DN, editor. *Total Burn Care*. 4th ed. Philadelphia: Elsevier; 2012. p. 125–30.
6. Gee Kee E, Kimble RM, Cuttle L, Stockton K. Comparison of three different dressings for partial thickness burns in children: study protocol for a randomised controlled trial. *Trials* 2013;14:403.
7. Evaluation of the Burn Wound: Management Decisions; Elisha G. Brownson, Nicole S. Gibran; *Total Burn Care*, 10, 87-92.e2
8. Nolte SV, Xu W, Rodemann HP et al.: Suitability of biomaterials for cell delivery in vitro. *Osteo Trauma Care* 2007; 15: 41-46.
9. Mądry R, Strużyna J, Stachura-Kuśach A, Drozd Ł, Bugaj M. Effectiveness of Suprathel® application in partial thickness burns, frostbites and Lyell syndrome treatment. *Pol Przegl Chir*. 2011 Oct;83(10):541-8. doi: 10.2478/v10035-011-0086-5. PMID: 22189281.