

Early Outcomes of Treatment with Suprathel® in Superficial and Deep Second-Degree Facial Burns: A Case Report

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ABSTRACT

Second-degree facial burns in the pediatric population represent a therapeutic challenge due to their functional, aesthetic, and psychosocial impact. The use of biosynthetic dressings has emerged as an effective alternative in the conservative management of these injuries. We present the case of a 5-year-old male patient with superficial and deep second-degree facial burns involving the entire face, corresponding to 9% of the total body surface area, secondary to accidental exposure to hot liquid. The patient was managed conservatively with the application of Suprathel® following wound cleansing and atraumatic superficial debridement. At 72 hours of follow-up, adequate adherence of the material, a significant reduction in pain, absence of clinical signs of infection, and early signs of reepithelialization were observed, with no progression in burn depth or need for additional surgical interventions. Early clinical evolution was favorable, allowing continuation of conservative management. This case report suggests that Suprathel® as a biosynthetic dressing for partial-thickness facial burns in pediatric patients may be a safe and effective therapeutic option with encouraging early outcomes; however, studies with larger sample sizes and long-term follow-up are required to confirm its impact on functional and aesthetic outcomes.

KEYWORDS: Facial burns; Second-degree burns; Pediatric patient; Suprathel®; Biosynthetic dressings; Reepithelialization.

ARTICLE DETAILS

Published On:
20 January 2026

Available on:
<https://ijmscrs.com>

INTRODUCTION

Burn injuries represent one of the leading causes of morbidity in the pediatric population worldwide, with a higher incidence in children under five years of age, a particularly vulnerable group due to anatomical, physiological, and behavioral factors. Immaturity of the injury response system, reduced cutaneous reserve, and limited ability to recognize risk situations increase the likelihood of thermal injuries in

this population. Within this context, facial burns are of particular relevance due to their potential impact on vital functions such as breathing, feeding, vision, and speech, as well as the aesthetic and psychosocial consequences that may persist long term.

Superficial and deep second-degree burns, also referred to as partial-thickness burns, affect the epidermis and a variable portion of the dermis, resulting in a heterogeneous clinical

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course. While superficial injuries often demonstrate adequate spontaneous reepithelialization, deep burns are associated with a higher risk of infection, delayed healing, and the development of hypertrophic scars or contractures, particularly when they involve anatomically complex regions such as the face. In pediatric patients, these complications may lead to facial growth disturbances and difficult-to-manage functional sequelae.

The therapeutic approach to facial burns in children requires a careful balance between wound protection, pain control, infection prevention, and optimization of aesthetic outcomes. Traditionally, management has included topical antimicrobial agents, conventional dressings, and serial wound care; however, these strategies may be painful, require frequent manipulation, and generate stress for both the pediatric patient and caregivers. In this setting, the use of skin substitutes and biosynthetic dressings has gained relevance as a therapeutic alternative, particularly in partial-thickness burns.

Suprathel® is a biodegradable biosynthetic membrane composed of polylactic acid copolymers, designed to act as a temporary epidermal substitute. Its properties include the creation of an optimal moist environment for wound healing, reduction of transepidermal water loss, mechanical wound protection, and an effective barrier against bacterial contamination. In addition, Suprathel® adheres spontaneously to the wound bed, degrades progressively as reepithelialization occurs, and is commonly associated with a significant reduction in pain and dressing change frequency, aspects that are particularly relevant in the pediatric population.

Several studies have documented favorable outcomes with the use of Suprathel® in second-degree burns, reporting reepithelialization times comparable to or better than conventional treatments, as well as reduced analgesic requirements and improved patient tolerance. However, evidence regarding its application in mixed-depth facial burns in young children remains limited, particularly with respect to early clinical outcomes during the first days following injury.

Early assessment of facial burn evolution is essential to identify initial signs of infection, evaluate dressing adherence, estimate reepithelialization progression, and make timely decisions regarding the need for additional interventions. In this regard, documentation of short-term outcomes, such as clinical evolution at 72 hours, provides valuable information for daily clinical practice and contributes to the growing body of evidence supporting the use of biosynthetic dressings in pediatric patients.

The aim of this case report is to describe in detail the early clinical evolution of a 5-year-old child with superficial and deep second-degree facial burns treated with Suprathel®, emphasizing initial tissue response, pain control, treatment tolerance, and findings observed at three days of follow-up, in order to contribute clinical evidence supporting its use in this type of injury.

CASE REPORT

A 5-year-old male patient, previously healthy and without relevant past medical history, was brought to the emergency department after sustaining a facial thermal burn secondary to accidental exposure to hot liquid in the home setting, approximately two hours prior to initial evaluation. On admission, the patient was hemodynamically stable, conscious, oriented, with an adequate respiratory pattern and no clinical signs of airway compromise.

Physical examination revealed thermal injuries involving the entire facial region, including the forehead, eyelids, cheeks, nasal area, perioral region, and chin. The lesions were characterized by erythema, ruptured blisters, and painful pale areas, consistent with superficial and deep second-degree burns. No signs of necrosis, exposure of deep structures, or ocular involvement were observed. Total burned body surface area was estimated at approximately 9%, corresponding to the entire face, according to the rule of nines in the pediatric population. Pain was assessed using a pediatric facial pain scale, with a high score recorded at admission.

Careful wound cleansing with sterile saline solution and atraumatic superficial debridement of devitalized tissue were performed under adequate analgesia according to pediatric protocols. No clinical signs suggestive of active infection were identified; therefore, systemic antibiotic therapy was not indicated. Considering the patient's age, the extent and mixed depth of the lesions, and the facial location, conservative management with a biosynthetic dressing was selected.

Suprathel® was applied directly to the viable dermal wound bed, carefully adapted to the facial contours. The material demonstrated adequate adherence without the need for additional fixation, uniformly covering the entire affected facial surface. A non-compressive secondary dressing was applied for external protection. The procedure was well tolerated, with no immediate complications, and analgesic management was continued as required, along with close monitoring and restriction of unnecessary dressing manipulation.



Figure 1: Hospital admission



Figures 2–5: Images obtained three days after the surgical intervention

At 72 hours after Suprathel® application, the patient was reevaluated. Adequate adherence of the material was observed over the entire facial surface, with no displacement or excessive exudate accumulation. Clinically, no signs of local or systemic infection were identified. The patient exhibited a significant reduction in pain, with decreased analgesic requirements and improved overall comfort. On inspection, areas corresponding to superficial second-degree burns showed early signs of reepithelialization beneath the biosynthetic membrane, while deep second-degree areas remained viable, with no progression in depth or conversion to full-thickness burns. Surrounding skin appeared intact, without maceration or excessive inflammatory response.

Early clinical evolution was favorable, allowing continuation of conservative management and avoiding the need for additional surgical interventions. The patient remained under outpatient follow-up to assess complete reepithelialization and scar evolution, with the aim of minimizing long-term functional and aesthetic sequelae.

DISCUSSION

Second-degree facial burns in the pediatric population represent a significant therapeutic challenge due to the anatomical complexity of the facial region, the functional importance of its structures, and the potential long-term aesthetic and psychosocial impact. In young children, even burns involving a limited total body surface area, such as the present case with 9% involvement corresponding to the entire face, require careful and timely management to prevent complications including infection, burn depth progression, pathological scarring, and functional sequelae.

Conservative management of partial-thickness burns aims to promote rapid reepithelialization, preserve viable tissue, minimize pain, and reduce the frequency of dressing changes. Traditionally, treatment has included topical antimicrobial agents and conventional dressings; however, these strategies are often associated with painful wound care, increased manipulation, and stress for both pediatric patients and their caregivers. In this context, biosynthetic dressings have emerged as an effective alternative, particularly in facial burns where preservation of aesthetic outcomes is critical.

Suprathel® is a biodegradable biosynthetic membrane designed to function as a temporary epidermal substitute, providing an optimal moist environment for wound healing, reducing transepidermal water loss, and offering mechanical and microbiological protection. Several studies have demonstrated that its use in second-degree burns is associated with reduced pain intensity, decreased analgesic requirements, and fewer dressing changes, benefits that are especially relevant in pediatric patients. In the present case, these effects were reflected in good treatment tolerance and a marked reduction in pain observed at the 72-hour evaluation. The early clinical evolution observed in this patient, characterized by good material adherence, absence of

infection, and early signs of reepithelialization in superficial burn areas, is consistent with findings reported in the literature. Furthermore, the stability of deep second-degree areas, without lesion progression or conversion to full-thickness burns, suggests that Suprathel® may contribute to preservation of the viable dermal bed and prevention of tissue deterioration, key factors in avoiding the need for skin grafting at later stages.

Short-term evaluation, such as that performed at 72 hours, is particularly important in pediatric facial burns, as it allows early identification of potential complications and assessment of initial treatment effectiveness. In this regard, documentation of early outcomes provides valuable clinical evidence, especially given the limited number of reports addressing the use of Suprathel® in extensive facial burns in young children.

Although this is a single case report and therefore subject to inherent limitations regarding generalizability, the favorable clinical course observed supports the use of Suprathel® as a safe and effective therapeutic option in the conservative management of superficial and deep second-degree facial burns in pediatric patients. Larger studies with long-term follow-up are needed to confirm its impact on wound healing quality and prevention of aesthetic and functional sequelae.

CONCLUSION

This case report documents the clinical experience with conservative management of superficial and deep second-degree facial burns involving the entire face in a 5-year-old pediatric patient, corresponding to 9% of the total body surface area. Early clinical evolution following Suprathel® application was favorable, characterized by adequate biosynthetic dressing adherence, significant pain reduction, absence of local or systemic infection, and early signs of reepithelialization at 72 hours of follow-up. These findings allowed continuation of conservative treatment, preventing burn depth progression and avoiding the need for additional surgical procedures in a region of high functional and aesthetic complexity.

The use of Suprathel® as a biosynthetic dressing proved particularly beneficial in the pediatric context, where reduced wound manipulation and decreased pain associated with dressing changes represent important advantages for both patients and caregivers. Additionally, the material's ability to maintain an optimal moist environment and protect the viable dermal bed may have contributed to tissue preservation and favorable evolution of deep second-degree burn areas, reducing the risk of conversion to full-thickness burns.

Early short-term evaluation, specifically at 72 hours, was essential for assessing initial treatment response, identifying potential complications, and supporting clinical decision-making aimed at continued conservative management. Documentation of these early outcomes provides additional clinical evidence regarding the use of Suprathel® in extensive

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pediatric facial burns, a scenario in which available literature remains limited.

Although the results described correspond to a single case and do not allow for generalized conclusions, the observed clinical course suggests that Suprathel® may be considered a safe and effective therapeutic option for the treatment of partial-thickness facial burns in young children, with potential positive impact on complication reduction and optimization of functional and aesthetic outcomes. Future studies with larger patient cohorts, prospective design, and long-term follow-up are necessary to confirm these findings and better define the role of biosynthetic dressings in the comprehensive management of pediatric facial burns.

REFERENCES

- I. Atiyeh, B. S., Costagliola, M., & Hayek, S. N. (2007). Burn prevention mechanisms and outcomes: Pitfalls, failures and successes. *Burns*, 33(2), 181–193. <https://doi.org/10.1016/j.burns.2006.08.021>
- II. Barret, J. P., & Herndon, D. N. (2003). Principles and practice of burn surgery. *Surgical Clinics of North America*, 83(3), 463–480. [https://doi.org/10.1016/S0039-6109\(02\)00168-4](https://doi.org/10.1016/S0039-6109(02)00168-4)
- III. Brusselaers, N., Monstrey, S., Snoeij, T., Vandijck, D., Lizy, C., Hoste, E., & Blot, S. (2010). Morbidity and mortality of pediatric burns. *Journal of Trauma*, 68(3), 611–616. <https://doi.org/10.1097/TA.0b013e3181bbcf69>
- IV. Deitch, E. A. (1990). Wheelchair burns: A preventable injury. *Journal of Burn Care & Rehabilitation*, 11(2), 174–176. <https://doi.org/10.1097/00004630-199003000-00012>
- V. Finnerty, C. C., Jeschke, M. G., Branski, L. K., Barret, J. P., Dziewulski, P., & Herndon, D. N. (2016). Hypertrophic scarring: The greatest unmet challenge after burn injury. *The Lancet*, 388(10052), 1427–1436. [https://doi.org/10.1016/S0140-6736\(16\)31406-4](https://doi.org/10.1016/S0140-6736(16)31406-4)
- VI. Greenhalgh, D. G. (2019). Management of burns. *New England Journal of Medicine*, 380(24), 2349–2359. <https://doi.org/10.1056/NEJMra1807442>
- VII. Kamolz, L. P., Lumenta, D. B., Parvizi, D., Riedl, O., Held, M., & Andel, H. (2014). Skin substitutes in burn management: An overview. *Burns*, 40(1), 1–12. <https://doi.org/10.1016/j.burns.2013.06.010>
- VIII. Kopp, J., Wang, G. Y., Horsch, R. E., & Kneser, U. (2015). The use of Suprathel® in deep dermal burns: First results of a prospective study. *Burns*, 41(4), 693–700. <https://doi.org/10.1016/j.burns.2014.10.009>
- IX. Lawrence, J. C. (1998). Dressings and wound infection. *The American Journal of Surgery*, 175(2A Suppl), 11S–16S. [https://doi.org/10.1016/S0002-9610\(97\)00284-8](https://doi.org/10.1016/S0002-9610(97)00284-8)
- X. Lumenta, D. B., Kamolz, L. P., Frey, M., & Parvizi, D. (2012). Use of Suprathel® in the treatment of partial-thickness burns: Results of a clinical study. *Burns*, 38(3), 388–395. <https://doi.org/10.1016/j.burns.2011.09.014>
- XI. Pham, T. N., Cancio, L. C., & Gibran, N. S. (2008). American Burn Association practice guidelines for burn care. *Journal of Burn Care & Research*, 29(1), 257–266. <https://doi.org/10.1097/BCR.0b013e31815f3876>
- XII. Sheridan, R. L. (2012). Burns in children. *Pediatric Clinics of North America*, 59(2), 473–489. <https://doi.org/10.1016/j.pcl.2012.03.012>
- XIII. Smolle, C., Cambiaso-Daniel, J., Forbes, A. A., Wurzer, P., Hundeshagen, G., Branski, L. K., & Huss, F. (2017). Recent trends in burn epidemiology worldwide. *Burns*, 43(2), 249–257. <https://doi.org/10.1016/j.burns.2016.08.013>
- XIV. Wasiak, J., Cleland, H., & Campbell, F. (2008). Dressings for superficial and partial thickness burns. *Cochrane Database of Systematic Reviews*, (4), CD002106. <https://doi.org/10.1002/14651858.CD002106.pub3>
- XV. Wood, F. M., Phillips, M., Jovic, T., Cassidy, J. T., Cameron, P., & Edgar, D. W. (2012). Water first aid is beneficial in humans post-burn. *Burns*, 38(6), 786–793. <https://doi.org/10.1016/j.burns.2012.03.003>