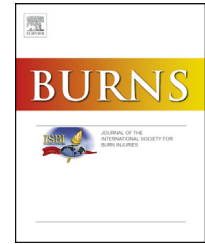


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Case report

Suprathel[®] for severe burns in the elderly: Case report and review of the literature[☆]

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ABSTRACT

Large burns in aged patients are common and treatment often reveals challenging. Cardiovascular complications significantly contribute to the unfavorable prognosis in this group of high-risk patients. Pain medication and sedation can negatively influence cardiovascular stability. Suprathel[®] is well-known for its almost pain free application and reduction of dressing change intervals, and thus lowers the demand for potentially harmful analgesics and sedatives. We present the case of an 81-year-old patient with 51% of total burned body surface area (ABSI = 12), who was completely treated with Suprathel[®]. Despite a predicted mortality of more than 80%, the patient survived and was discharged home without significant handicaps 69 days after burn. We hypothesize that Suprathel[®] beneficially contributed to the favorable clinical course of this critical patient as less frequent wound-dressing changes did not induce additional pain or sedative medication and thus improved cardiovascular stability.

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1. Introduction

More than 20% of the current population is over the age of 65 and the age group of 85 years and older is more than doubling annually according to the European statistics of 2014 [1]. Thus severe burns are more frequent, and common in the elderly compared to younger ages since loss of reflexes, lack of coordination, reduced alertness and general co-morbidities hinder from adequate protection [2]. Concomitant, high age is an independent risk factor for mortality after severe burns.

Both commonly used burn prognosis indexes, namely abbreviated burn severity index (ABSI) and Baux-score, include age as one major determinant for survival probability prediction [3–5]. Therefore, older people are not only more prone to severe burns they are also less likely to survive. Wearn et al. recently published data revealing mortality rates of more than 50% in patients over the age of 65 suffering from burns larger than 20% of the total body surface area (TBSA) [6]. Besides generally decreased wound healing capacities, older patients provide a less competent immune system and lower cardiovascular capacity and stability, which make them more prone to sepsis as well as life-threatening arrhythmias, renal

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insufficiency and other cardiac complications. Therefore, this special group of patients benefits from burn treatment that supports wound healing, protects from infection and does not jeopardize cardiovascular stability.

Suprathel[®] is a full synthetic skin substitute based on E-caprolactone, tri-methylene-carbonate and DL-lactic [7]. Upon hydration it adapts to the body contour and is self-adhesive. It is permeable to wound secrets and peels off with re-epithelialization. Currently, Suprathel[®] is an established treatment option for superficial dermal burn wounds at the hands and some studies demonstrate that Suprathel[®] positively influences wound healing, scar appearance, pain management and wound infection [8,9]. However, all these beneficial attributes have not yet been assessed in the light of treating large burns in elderly high-risk patients.

In this case report we present an 80-year-old patient with 51% burned TBSA, who was completely and successfully treated with Suprathel[®]. Furthermore, we provide a comprehensive review about Suprathel[®] utilization reported in current literature with special focus on (elderly) high-risk patients.

2. Case report

An 81-year-old man of Caucasian decent sustained burns to his face, upper body, and lower legs after using ethyl alcohol to accelerate combustion of garden residue. After the accident he visited his general practitioner where he got intubated by an emergency physician and transferred to our burn center via helicopter. Upon arrival the burned TBSA was assessed after thorough debridement and revealed 51% affecting his face, neck, chest, both arms and lowers legs (Figs. 1 and 2). Total burned body surface area was assessed with means of the Wallace rule of nines. Due to brisk capillary refill after removal of blizzards and debridement with an abrasive sponge (DermaPrep, 4Med Ltd., Sderot, Israel), burn depth was defined as superficial dermal. Importantly, to increase validity and accuracy of the clinical assessment, evaluation of burn depth



Fig. 1 – Photograph of the patient presented in this case report taken at initial admission to our hospital and during shock room care. The picture depicts the extent of the burn, involving head, neck, chest, both arms/hands and lower legs (51% TBSA). The burn depth after wound cleaning was defined as superficial dermal (2a°).



Fig. 2 – Photograph of the patient presented in this case report taken at initial admission to our hospital and during shock room care. The picture depicts the burned surface at the lower legs.

and burned surface area was performed independently by two experienced burn surgeons. Based on age, burned TBSA and co-morbidities such as arterial hypertension, atrial fibrillation, and congestive heart failure with an ejection fraction of less than 45%, ABSI and Baux-score revealed 12 and 131 points, respectively, and thus an expected mortality of more than 80%. During shock room team time-out, we discussed the further approach and decided for full medical care based on the reportedly high quality of life and self-supported living prior to the accident.

Decision was made for Suprathel[®] application to cover the entire burned surface area. After thorough debridement under adequate analgesia, Suprathel[®] sheets were directly applied on the wound surface and covered by two layers of fatty gauze (Figs. 3 and 4). During the following wound dressing changes, only the superficial layer of fatty gauze needed to be changed and as this layer had no direct contact to the burned skin, additional analgesia was not used.

At the first day after admission to our burn center, the patient was extubated and was pulmonary stable with intermittent non-invasive ventilation. He was awake, conscious and responsive. Diuresis induced low dose of catecholamines due to a pre-existing arterial hypertension. At day 5 the patient showed a classic second hit of severe burns. Starting with progressive pulmonary dysfunction with re-intubation and invasive ventilation, systemic vascular resistance and cardiac index decreased rapidly despite high doses of catecholamines. Concomitant, leukocytes, C-reactive protein as well as body temperature increased with which the patient provided a definitive systemic inflammatory response syndrome. Upon microbiological proof of massive *Escherichia coli* in the tracheal probes and blood cultures as well as acute on chronic kidney failure and decreasing gastro intestinal function, the patient further developed sepsis with pulmonary focus and consequent multi organ dysfunction. Within the following 6 days and immediate administration of resistogram adjusted antibiotics as well as supportive therapy for improving cardiovascular, respiratory, kidney and bowel function, the patient recovered well without further complications.

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