Application of SUPRATHEL® in diverse indications

Scientific Update 10/2017

Alloplastic Skin Substitute (SUPRATHEL®) dressings in treatment of donor sites in children with burns...
An option for difficult-to-decide cases...
Bromelain based debridement agent introduction to our daily practise, modifications to the standard protocol and post-debridement wound dressing...
Comparative Evaluation of effectiveness of alloplastic Skin Substitute “SUPRATHEL®” and histoequivalent bioplastic material...
Early surgical treatment of burns using wound coverings...
Results from Application to an Absorbable Synthetic Membrane to Superficial and Deep Second Degree Wounds...
The treatment of epidermal and deep dermal wounds with polylactid based membrane...
The Use of SUPRATHEL® Skin Substitute for Partial Thickness Burns in a UK Regional Burns Centre...
Treatment of second degree burns...
Use of alloplastic temporary skin substitute* in the treatment burn wounds of II degree...
Use of SUPRATHEL® in surgical, non-surgical, non-surgical and enzymatically debrided burns...
Use of SUPRATHEL® as a complete epidermal substitute in a boy with extensive toxic epidermal necrolysis...
Welcome

SUPRATHEL® received significant attention at both the EBA in Barcelona and the GBMC in Dubai this month with 3 oral and over poster presentations.

The presentations showed data on the

- Over 1000 patients successfully treated with SUPRATHEL® at the UKB in Berlin where SUPRATHEL® has become the standard of care for all partial thickness burns (Dr. Sander, GBMC 2017),
- Potentially higher quality of skin after treatment with SUPRATHEL® (compared to AquacelAg or auto-grafting) (Dr. Demircan, EBA 2017),
- SUPRATHEL®'s value in the treatment of children in Pakistan – including the ability to treat deep dermal burns and significant reduction in pain (Dr. Iqbal, EBA 2017).

The 12 posters on SUPRATHEL® presented at the EBA 2017 can be found online as well.

We thank all presenters for their contributions to better understanding when and how SUPRATHEL® can be used in the clinical practice as well as the over 30 participants at our SUPRATHEL® User Workshop at the EBA.

If you have any questions about SUPRATHEL®, please feel free to contact me or our team. We will do whatever we can to make sure your patients will receive the best treatment.

Thank you!

Christian Planck
Chief Operating Officer
Aim of research:
The aim of this study was to investigate the efficiency of alloplastic skin substitute dressings on pain syndrome and epitheliazation of donor sites in burned children.

Materials and Methods:
Twenty-four patients with 2-3 degree burns up 3% to 15% of body surface were studied. Patients were treated in Burn Center from 1 January to 31 December 2016. Split grafts were isolated with disc dermatome. Thickness of grafts was 0.3-0.4 mm. SUPRATHEL® was placed on donor wounds in 11 patients. In control group (13 patients) one-level gauze ointment dressings were used. Patients age in SUPRATELR and control group did not differ (11.9±3.36 and 14.2±4.94 months, Z=-1.2, p=0.23).

Results:
In SUPRATHEL® group the dressings were not removed until complete epitheliazation of donor wounds and changing of SUPRATHEL® dressings was not necessary. In control group changing of dressings was needed in 4 patients.

The Study has proved that in case of use of alloplastic skin substitute SUPRATHEL®, median epitheliazation time was 5.7±1.01 days, in control group - time was 8.7±1.49 days (Z=-3.8, p=0.0002). According to Verbal Descriptor Scale expression of pain syndrome was less in SUPRATHEL® group than in control group (1.5±1.04 and 5.2±0.9 respectively, Z=-4.1, P<0.001).

Conclusion:
Our study shown that use of alloplastic skin substitute SUPRATHEL® is effective in treatment of donor wounds in pediatric burns. Time of epithelization is shortened and pain syndrome is reduced.
Delayed use of polylactide-based copolymer (Suprathel®) for pediatric partial-thickness burns: An option for ‘difficult-to-decide’ cases

Ayse Ebru ABALI, Gokhan MORAY, Mehmet HABERAL; Burn and Fire Disasters Institute, Baskent University, Ankara, Turkey

Many partial-thickness burns in children lead to confusion whether they are superficial or deep. Polylactide-based copolymer (Suprathel®) is a synthetic temporary skin substitute. It is promptly used for superficial dermal burns. But, surgical-debridement is required before using Suprathel® for deeper dermal burns. This study aimed to document the outcomes of delayed outpatient use of Suprathel® (following outpatient wound-care with non-surgical debridement methods) in those cases whose wound-depths are ‘difficult-to-decide’.

Patients and Methods:

The subjects: Pediatric burn-victims (n=47) who were treated with Suprathel® following outpatient wound-care with non-surgical debridement methods (2013-2016)

Non-surgical debridment (every alternate day)
- Debridement of thin necrotic material: Triticum Vulgare (fito krem, Abdi İbrahim, İstanbul-Turkey)
- Debridement of thick necrotic material: Modified starch polymer gel (Askina gel, Braun, Sligo-Ireland)
- After elimination of necrotic material, outpatient application of Suprathel®

Collected Data:
- Age, sex, burn-cause, extent of burns, depth of burn-wounds, body-sites affected;
- Time-intervals between occurrence of injury and admission;
- Time-intervals between admission and Suprathel® application;
- Time-intervals between occurrence of injury and completion of epithelization;
- Numbers of Suprathel® applications;
- Surgical-debridements, split-thickness-skin-graftings/full-thickness-skin-graftings (STSG/FTSG);
- Requirements of physiotherapy/splints, reconstructive surgeries (mean±SEM).

Followup: 3months-2years (Figure 2)

Results:

Burn cause Age, and sex distribution (M/F) TBSA/TBSA partial thickness (%) Scalds (n=34,72,3%) 4,96±15 and 0,46/3,37 Contact burn (n=9,19,1%) 2,28±0,9 and 1/1 Flare Burns (n=2, 4,3%) 15,5±0,5 and 2/0 Flash Burns (n=2, 4,3%) 16±1 and 1/1 Flame burns (n=2, 4,3%) 15,5±0,5 and 2/0 Total (n=47, 100%) 5,14±0,8 and 0,68/0,39

Time interval between injury and admission 1,6±0,36 days Time interval between admission and Suprathel® application 6,53±0,64 days Time interval between injury and epithelization 17,4±1,07 days

Suprathel® application: Once Suprathel® application: Twice No Suprathel® application: 66% (n=31) 34,04% (n=16) burn wounds at head and neck in 12 cases

AFFECTED BODY SITES (n=47)

<table>
<thead>
<tr>
<th>Body Site</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hands</td>
<td>38,9% (n=18)</td>
</tr>
<tr>
<td>Feet</td>
<td>31,9% (n=15)</td>
</tr>
<tr>
<td>Upper extremities</td>
<td>38,9% (n=18)</td>
</tr>
<tr>
<td>Lower extremities</td>
<td>14,9% (n=7)</td>
</tr>
<tr>
<td>Trunk</td>
<td>14,9% (n=7)</td>
</tr>
<tr>
<td>Genital</td>
<td>4,3% (n=2)</td>
</tr>
<tr>
<td>Head and neck</td>
<td>29,8% (n=14)</td>
</tr>
</tbody>
</table>

TREATMENT MODALITIES (n=47)

<table>
<thead>
<tr>
<th>Treatment Modality</th>
<th>required</th>
<th>Not required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute/long-term follow up:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical debridement</td>
<td>17,4% (n=8)</td>
<td>82,6% (n=39)</td>
</tr>
<tr>
<td>STSG/FTSG</td>
<td>6,5% (n=3)</td>
<td>93,5% (n=44)</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>32,6% (n=15)</td>
<td>67,4% (n=32)</td>
</tr>
<tr>
<td>Splinting</td>
<td>11,4% (n=5)</td>
<td>88,6% (n=42)</td>
</tr>
<tr>
<td>Reconstructive surgery</td>
<td>4,3% (n=2)</td>
<td>95,7% (n=45)</td>
</tr>
</tbody>
</table>

DISCUSSION & CONCLUSIONS:

Outpatient wound-care with non-surgical debridements followed by Suprathel® application is a functional option for ‘difficult-to-decide’ partial-thickness burns in childhood. This method seems to reduce need for sedoanalgesia and to prevent exaggerated surgical approaches which may lead to painful and uncomfortable overtreatment courses.
INTRODUCTION

In modern burn therapy an optimal debridement must be effective, fast and safe. At present, surgical excision followed by autografting is the standard of care (SOC) for deep burns. However, invasive surgery often results in loss of viable tissue, blood and heat. We present an early single center experience with a new Bromelain Based Debridement agent (BBD).

METHODS

- From May 2015 to May 2017
- 62 patients with deep partial and full thickness thermal burns
- Aged between 18-79 years
- TBSA no more than 20%

BBD application was performed at the patient’s bedside under IV analgesia while BBD removal was performed in the operating theatre under analgo-sedation. After eschar removal, full thickness burns were autografted, while viable dermis and mixed wounds were treated with UrgoClean®, Suprathel® or fatty gauze. A retrospective analysis of patients treated with conservative dressings was conducted to evaluate time to wound healing, pain scores, and number of dressing changes. The pain scores were obtained during dressing changes using the visual analog pain scale 1–10; 0 being no pain, 5 being moderate pain, and 10, the severe pain.

RESULTS

- 62 patients were treated with BBD
  - 37 male and 25 female, aged 18-79.
  - The mean TBSA treated was 7.1 % (range 3-20%).
  - 19 patients were autografted
  - 43 patients were treated conservatively (Fig.2).

Characteristics of patients treated conservatively

- 14 patients were treated with UrgoClean®
- 11 patients were treated with Suprathel®
- 17 patients were treated with fatty gauze

The patient and burn characteristics were shown in Table1. Data regarding wound treatment characteristics were shown in Table 2.

CONCLUSIONS

In our experience, BBD proved to be an effective, fast and selective therapeutic tool for burn wound management. Our modifications to the standard protocol made BBD application easier and more practical and allowed a more effective eschar removal. Our data regarding the use of UrgoClean, Suprathel and fatty gauze in the post-enzymatic debridement wound dressing suggest that all three dressings were effective managing partial-thickness and deep partial-thickness burn wounds. Time to wound healing was similar among the three treatment groups. However, the treatment profiles differed partially with a limited number of wound dressing changes and lower pain scores for the UrgoClean and Suprathel groups compared with the fatty gauze group.
Objectives: To investigate effectiveness of alloplastic skin substitute "Suprathel" for treating burn wounds.

Methods: "Suprathel" is a microporous membrane, consisting of copolymer of polylactide and other polymers. In conditions of wound healing, this synthetic material performs substitute function of damaged skin and stimulates regeneration.

Before using materials, II-III degree burn wounds underwent dermabrasion by synthetic brush, electric dermatome, or hydrosurgical system "Versajet". Patients from group of comparison were treated using histoequivalent-bioplastic material G-DERM (membrane based on hyaluronic acid and collagen).

The results are shown in the tables below.

Discussion/Conclusion: Application of alloplastic skin substitute "Suprathel" provides effective treatment for border and mosaic II-III degree burn wounds.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Alloplastic skin substitute &quot;Suprathel&quot;</th>
<th>Histoequivalent-bioplastic material G-DERM</th>
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<tbody>
<tr>
<td>Number of patients</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Time of epithelization (days after injury)</td>
<td>14,8±1,6</td>
<td>15,6±1,1</td>
</tr>
<tr>
<td>Wounds required auto skin grafting (%)</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Pain during dressing change (score)</td>
<td>2,4±0,5</td>
<td>5,1±0,9</td>
</tr>
</tbody>
</table>
Aim. To develop methods of early surgical treatment of deep dermal burns with wound dressings.

Methods. Annually in the center 1,300 treated patients with burns (including 700 children). Running up to 2000 operations. In 500 patients with deep dermal burns are performed annually in the early necrectomy 2-5 days after injury to the closure of wound dressing wounds. Since 2015 applies «Suprathel». In order to create optimal conditions for the epithelialization of deep dermal burns after necrectomy the wound impose «Suprathel».

Results. After necrectomy to the lower layers of the dermis perform napkins with epinephrine hemostasis for 5-7 minutes. Then superimposed sterile wound covering «Suprathel», which is fixed with a bandage. Subsequently, only cosmetic dressings performed starting from the third day after surgery. Wound coatings are not removed until complete epithelialization of wounds. Epithelialization occurs depending on the depth of burns 8-12 days after surgery. When staged surgical treatment of painful dressings with ointments, without «Suprathel», made every other day for 15-21 days.

Conclusion. In combustiology clinical picture of wound healing is diverse and depends on the stage of wound healing and burn depth. In the traditional, staged surgical treatment of deep dermal burns tend to deepen with the formation of granulation tissue and the need to follow autoplasty. A more preferred method of treatment of deep burns is a method of early surgical treatment, in which the crust is removed in the early stages after the burn, and the wound is closed wound coverings. Research result has been an advantage once the surgical treatment of wounds using «Suprathel» to the local conservative treatment with long-lasting dressings.
OBJECTIVES
- Understand different treatment options for second degree burns
- Compare outcomes after different treatments for second degree burns
- Discuss outcome measures for second degree burns
- Evaluate cost of different treatment options for second degree burns

ABSORBABLE SYNTHETIC MEMBRANE

STUDY DESIGN
- Retrospective chart review
- 2nd degree wounds (2A and 2B)
- Patient received wound debridement under sedation/anesthesia and absorbable synthetic lactic acid based membrane was placed (= standard care)
- Study period: 9/1/2013 - 9/30/2014
- IRB approval was obtained

OUTCOME PARAMETERS
- Demographics
- Pain (average)
- Size of burn
- Time to healing
- Failure (required removal/grafting)
- Hypertrophic scarring

PROCEDURE
- Dermabrasion (in OR) or rough deridement (under sedation) of wound
- Rinse with sterile saline
- Dab dry
- Apply (absorbable lactic acid) membrane
- Cover with bridal veil (Dermanet®, N-terface®...)
- Cover with absorbent gauze
- Cover with bridal veil (Dermanet®, N-terface®...)
- Change outer dressing every 1-4 days down to bridal veil
- Remove when healed

Comparison to Other Skin Substitutes

Comparison Lactic Acid Membrane, Collagen Synthetic Membrane with Fetal Cells and Calcium Alginate + A+ on Donor Sites

CASE STUDY

Membrane applied 5 hours after burn after dermabrasion
Staph aureus pneumonia
Extubation day 7
Discharge home day 13

Cost Analysis

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Sedation &amp; Debridement</td>
<td>$2500</td>
</tr>
<tr>
<td>Membrane</td>
<td>$900</td>
</tr>
<tr>
<td>Silver &amp; gauze outer dressing</td>
<td>$400</td>
</tr>
<tr>
<td>Change outer dressing every 3 days x3</td>
<td>$300</td>
</tr>
<tr>
<td>Nursing time average 5 hours</td>
<td>$400</td>
</tr>
<tr>
<td>Healing in 15 days</td>
<td>$4100</td>
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<tr>
<td>Collagen Membrane With Cells 3% TBSA</td>
<td>$2800</td>
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</table>

Ointment Dressings 3% TBSA Cost

<table>
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<tr>
<th>Item</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Sedation &amp; Debridement</td>
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<tr>
<td>Membrane</td>
<td>$300</td>
</tr>
<tr>
<td>Gauze outer dressing</td>
<td>$200</td>
</tr>
<tr>
<td>Change outer dressing every 3 days x3</td>
<td>$1000</td>
</tr>
<tr>
<td>Nursing time average 1 hour</td>
<td>$100</td>
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<tr>
<td>Healing in 15 days</td>
<td>$3000</td>
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</tbody>
</table>

Lactic Acid

<table>
<thead>
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<th>Item</th>
<th>Cost</th>
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<tr>
<td>Sedation &amp; Debridement</td>
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Burn injuries are a major cause for hospilization in undeveloped countries and are associated with significant morbidity and mortality particularly in children under the age of four years.

Over 50% of burn injuries involve the head and neck region and can be caused by flame, electric current, steam, chemicals and hot substances. Hot liquids are the most common cause of these injuries in the pediatric group.

In the last 40 years the management of Burns has changed dramatically, one of those changes is the early escharectomy during the first 72 Hrs. With these we can decrease the colonization and bacterial propagation and decrease the possibility the SRIS presentation, less pain and adequate healing.

But now we need to cover the wound soon as possible.

To prevent losses: Water, electrolytes, proteins and of course to prevent the presence of infections.

Suprathel (TM) is a polylactide-based membrane, alloplastic, absorbable skin substitute that is highly permeable to oxygen and water vapor, providing a particularly favorable environment for wound healing.

Results

- **2007 – 2015**
  - Donnor sites
    - Standard care (non adherent gauze): 13 days
    - Suprathel: 6 days
  - Scalds: 51
    - 78.46%
  - Fire: 14
    - 21.54%
  - Male: 31
    - 47.69%
  - Female: 34
    - 52.31%

- **2007 – 2015**
  - 2° superficial: 43
    - 66.15%
  - 2° Deep: 22
    - 33.85%

- Conventional treatment: 18.5 days
  - Suprathel group: 11.3 days
    - 39% less
The Use of Suprathel® Skin Substitute for Partial Thickness Burns in a UK Regional Burns Centre

St Andrew’s Centre for Plastic Surgery & Burns, Chelmsford, United Kingdom

Introduction
Innovative new dressings such as Suprathel® allow for effective skin replacement in the treatment of partial thickness and mid depth burn wounds. We aim to present our experience with the use and effectiveness of Suprathel®, a synthetic skin substitute, in a range of uses in burn practice for partial thickness burns in children and adults.

Methods
Retrospective analysis of medical case notes of St Andrews patients who had Suprathel® application from Jan 2014 to Feb 2017. Data was collected from case notes, the study evaluated re-epithelialization time, grafting, wound colonization, infection, length of hospital stay (LOS), wound over-granulation and hypertrophic scar formation. Suprathel® was applied after debridement, followed by Vaseline gauze or Silicone dressings, betadine gauze and bandages. Outer dressings were changed every 2 days unless Infection dictated otherwise.

Results
Eighteen patients were identified (mean age 12.15 years, range 1–54) with a mean total body surface area (TBSA) of 9.7% (range of burn size 2.5 – 21%) were included. 7 cases were superficial partial thickness, 11 cases were mixed depth with mid-deep dermal components. Median LOS was 9 days (range 2 - 26). Median re-epithelialization time was 15 days (range 9–48). 7 patients took over 21 days to heal. One patient developed hypertrophic scarring. 4 patients developed wound over-granulation. Suprathel® was applied to donor site in one case and directly to burn wound in 17 cases. 8 cases underwent Versajet debridement prior to application. Suprathel® failed to adhere in one case. Three patients needed further split skin grafting to areas initially managed with Suprathel®. Out of the 18 patient we looked at 16 wounds were colonized during treatment, with 4 developing wound infection clinically.

Conclusions
Suprathel® is a versatile dressing solution for adult and paediatric patients suffering from burns. The different potential uses have learning curves for the multidisciplinary team. Suprathel® has the advantage that it may also be used to treat mid to deep dermal burns. In patients with extensive burns, Suprathel® can be used to cover the deep dermal burn wounds to prioritise skin grafts and their donor sites for full thickness burned areas. Further experiences with Suprathel® will help to determine its use to maximise its healing potential to improve aesthetic outcomes for scarring.
Treatment of Second Degree Burns with Lactic Acid Skin Substitute in the Outpatient Setting:
Pain and Patient Comfort

Deborah Boorse, CRNP and Sigrid Blome-Eberwein, MD
Burn Recovery Center, Lehigh Valley Health Network, Allentown, PA

OBJECTIVE
A burn wound coverage has long been sought that, among other requirements, reduces pain, protects the fragile wound bed, and minimizes the risk of infection during the healing phase of second degree burns.

METHODS
Our burn center experience with lactic acid skin substitute spans 3 years treating over 400 patients with partial thickness thermal burns, ages ranging 8 weeks to 95 years old.

Under moderate sedation, wounds are initially debrided and lactic acid skin substitute and petroleum based gauze is applied. Outer dressings and burn net are then applied.

The patient is discharged with outer layer dressing changes planned every 2-3 days. Over the next 6-14 days, loose edges of the skin substitute are trimmed as they separate from epithelialized wound margins until all has separated in the outpatient setting.

RESULTS
Overall, there has been positive response from patients and families. Most patients and their families welcome the prospect of a “no-touch” wound care system as well as the decreased need for opiate pain control and dressing materials.

Benefits include:
- Dressing changes, with virtually no pain, are easily taught to family members.
- The need for IV pain control for dressing changes is reduced, resulting in decreased hospital length of stay.
- The lactic acid skin substitute is generally well tolerated at home.

Occasional reports of disadvantages include the following:
- Itch beneath dressing (toward the end of the healing phase);
- Inability to shower;
- Unusual (but inconsequential) color changes in bilayer as healing progresses; and
- Uncomfortable warmth of dressing (rare).

CONCLUSION
The lactic acid skin substitute currently utilized in our burn center appears to meet the needs of pain control, wound bed protection, and infection risk minimization. The lactic acid skin substitute provides a relevant option in the treatment of partial thickness burns.
Objective: to evaluate the efficiency of alloplastic temporary skin substitute* in the treatment of patients with burn wounds of II degree after debridement.

Material and method: the study included 7 patients with II degree burns on the area from 3 to 5% TBSA (an average of 4.2%), aged from 28 to 55 years. All patients on 3-4 day from receipt of debridement was performed under anesthesia within the living dermis. During the operation, performed a careful hemostasis. Further postoperative wounds were closed alloplastic temporary skin substitute* and a single layer sheet of fatty gauze dressing, which fixed with a bandage. All patients received antibacterial therapy. The effectiveness of alloplastic temporary skin substitute* in the topical treatment of postoperative burn wounds evaluated on terms of its healing, the incidence of purulent complications, number of dressings, according to the degree of severity of pain.

Results: the 6 patients had favorable course of early postoperative period (the absence of suppuration, discharge from the wound, the temperature of the reaction, pain). Therefore, the first ligation was made by 7 days after debridement. Were removed only the surface layers of secondary casts over the alloplastic temporary skin substitute*. The second ligation was performed on 13-15 day, when it was against the backdrop of biodegradable coatings complete healing has taken place. All wore bandaging painless nature and did not require anesthesia.

In the one patient was noted accession secondary infection, necessitating daily dressings with antiseptics, antibacterial therapy has been strengthened. Complete wound healing came only on the 23 day. Pain in this patient during dressing changes were more pronounced pain in group II was more pronounced.

Conclusion: application of innovative alloplastic temporary skin substitute* in the treatment of patients with burns of II degree efficiently and economically feasible.
USE OF SUPRATHIEL IN SURGICAL, NON-SURGICAL AND ENZIMATICALLY DEBRIDED BURNS

Elena García-Vilariño, Enrique Salmerón González, Eloy Condiño Brito, Alberto Ruiz Cases, M. Dolores Pérez del Caz
Unidad de Quemados. Hospital Universitari i Politècnic La Fe

OBJECTIVE
We evaluated the use of Suprathel®, a synthetic copolymer membrane from polylactids that provides a temporary wound coverage in burn patients.

METHODS
From April 2013 to May 2017, 29 patients with mid-dermal or deep-dermal burns were treated with Suprathel® and evaluated retrospectively. Suprathel® was applied:
- After Nexobrid®
- After hydro-debridement with Versajet®
- On donor sites
- On mid-dermal non surgical burns.
The outer dressings were changed every 2-3 days and the evolution was closely evaluated.

RESULTS
53 year-old female. A. 1st Day of burn, showing deep dermal burn after scald. B. Wound coverage with Suprathel® at emergency care. C. Complete reepithelization after a following period of 30 days.

CONCLUSION
Suprathel has proved to be a useful dressing in certain burn cases. Due to the reduction in cure frequency and wound manipulation a reduction of pain, sedation procedures, fasting periods and anesthetic medication are achieved.

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Use of Suprathel® as a complete epidermal substitute in a boy with extensive toxic epidermal necrolysis

1Renkert-Baudis M, 2Schöler M, 3Demirakca S, 4Jung T, 4Mockenhaupt M, 1Lange B

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2Department of Anaesthesiology and Surgical Intensive Care, University Medical Center, 68167 Mannheim, Germany
3Department of Neonatology and Pediatric Intensive Care, University Medical Center, 68167 Mannheim, Germany
4Department of Dermatology, University Freiburg – Medical Center, 79104 Freiburg, Germany

Objectives
Toxic epidermal necrolysis (TEN) is a rare, potentially life-threatening condition characterized by extensive loss of skin and mucosa of more than 30% total body surface area (TBSA). It is linked to certain drugs as well as viral or bacterial infections, resulting in a dysregulated immune reaction against epithelial cells. Treatment, as in thermal injuries, should include an early referral to a burn unit. This case report demonstrates a life-saving management of TEN with an epidermal substitute (Suprathel®) in a pediatric patient with epidermal damage of 100% TBSA.

Methods
A ten-year-old boy was admitted to our pediatric burn center complaining of foreign body sensation and photosensitivity of the eyes, headaches, pyrexia and presenting with extensive epidermolysis involving 100% TBSA. A skin biopsy confirmed the diagnosis of TEN with a complete loss of the epidermal layer as well as extensive mucosal involvement. The patient required fluid resuscitation and admission to the pediatric intensive care unit. Wound care consisted of gentle debridement of the blistered areas followed by extensive Suprathel® application.

Results
Repeated Suprathel® application maintained the skin barrier function over time and resulted in almost complete reepithelialization. The mucosa of the urogenital tract and eyes showed an almost complete restitution, as well. After a six-week inpatient stay the patient could be discharged to our outpatient care. Two years after treatment the patient is satisfied with the results and the skin is virtually free of scars with a normal appearance and elasticity.

Conclusion
In children, TEN with extensive epidermal loss is a rare, life-threatening condition that requires admission to a specialized pediatric burn unit. Suprathel® proves beneficial in the management of these cases by providing a skin barrier until natural reepithelialization occurs.
KEY BENEFITS

Significant pain relief - by up to 60%¹
- Significantly less IV narcotic management required
- Minimally manipulative dressing changes without anesthesia

Low rate of infections and inflammatory response, no biologic risk
- Synthetic, biocompatible, absorbable
- No reported allergic reactions, only few cases with infections and inflammation

Fast wound healing²
- Improved early epithelization
- Early mobilization can begin 2-5 days following application

Lower treatment costs³ - by up to 69%
- One-time wound dressing, no change of SUPRATHEL® needed
- Less care and aftercare needed, shortened need for hospitalization
- Less administration of pain medication needed

Good cosmetic and functional outcomes and scar quality⁴

Literature

² Uhlig et al., Burns Nov. 33/2007; Schwarze et al., Burns Nov. 33/2007
³ Keck et al., Burns 2012; Uhlig et al., Burns Nov. 33/2007; Highton et al., Burns 39/2013
⁴ Schwarze et al., Burns Nov. 33/2007; Everett et al., J. Wound Care 24/2015