

# Use of Suprathel<sup>®</sup> Dressing in a Young Infant with TEN

Klaus Pfurtscheller, M.D., Gerfried Zobel, M.D., Siegfried Roedl, M.D.,  
and Marija Trop, M.D.

Department of Pediatrics, Pediatric Intensive Care Unit and Children's Burns Unit, Medical University of Graz,  
Graz, Austria

**Abstract:** Toxic epidermal necrolysis and Stevens-Johnson syndrome are potentially life-threatening skin disorders. We report that a 3-month-old infant, a patient with toxic epidermal necrolysis, who in addition to a standard resuscitation protocol for burns received treatment with Suprathel<sup>®</sup> (PolyMedics Innovations GmbH, Filderstadt, Germany) and fatty gauze as topical wound dressings in the form of a whole body cover with complete recovery. This is the first case report of Suprathel<sup>®</sup> being used successfully in a baby with toxic epidermal necrolysis.

Toxic epidermal necrolysis (TEN) is rare in early infancy. Potential complications include wound infection, sepsis, malnutrition, and pain. The clinical similarities to those seen in patients with major burns mandate that patients with extensive skin involvement should be managed either in a burn center or in a pediatric intensive care unit familiar with management

of TEN. The mortality rate of TEN depends on the extent of involved body surface area and ranges from 0 to 60% (1). Toxic epidermal necrolysis is particularly rare in newborns and infants younger than four months—only five patients have been documented in literature, all with a fatal outcome associated with sepsis (2–6) (Table 1).

**TABLE 1.** Fatal Cases of TEN in (Preterm) Newborns and Small Infants Described in the Literature

Reference	GA	Diagnosis	Age at disease/ erythema onset	Infectious agent	Outcome after erythema onset
Lohmeier 2005 (2)	27 wks	VLBW, IRDS, perforation, sepsis	9 days/3 wks 3 days	Coagulase negative <i>Staphylococcus</i>	Death within 1 wk
Picard 1994 (3)	Term	CF, Pneumonia, Ileus, sepsis	3 mos/4 mos	<i>Klebsiella pneumoniae</i>	Death within 2 days
Scully 1992 (4)	Term	Urosepsis, perinephric abscess, DIC	2 wks/7 wks	<i>Escherchia coli</i>	Death within 1 wk
Hawk 1985 (5)	Term	Pulmonary valve dysplasia, Goretex shunt, sepsis, DIC	3 wks/5 wks 5 days	<i>Klebsiella pneumoniae</i>	Death within 2 days
de Groot 1984 (6)	26 wks	VLBW, PDA, IRDS, septicemia, shock	1 day/5 wks	<i>Klebsiella pneumoniae</i>	Death within 3 days

GA, gestational age; VLBW, very low birth weight; IRDS, infant respiratory distress syndrome; CF, cystic fibrosis; DIC, disseminated intravascular coagulation; PDA, persistent ductus arteriosus; TEN, toxic epidermal necrolysis.

Address Correspondence to Marija Trop, M.D., Children's Burns Unit, Auenbruggerplatz 30, Graz 8036, Austria, or e-mail: marija.trop@meduni-graz.at.

DOI: 10.1111/j.1525-1470.2008.00766.x

### CASE REPORT

A 3-month-old infant with a recent history of respiratory syncytial and adenovirus bronchiolitis was readmitted to a pediatric hospital with a one day history of high fever (39°C), reduced oral intake, and skin erythema beginning on the palms and soles, rapidly spreading to involve her face, upper trunk, and extremities. Her general condition deteriorated and she

was therefore transferred to a specialized Intensive Care and Children's Burns Unit. Widespread erythematous macules, vesicles, and bullae affected approximately 30% of the total body surface area (TBSA) (Fig. 1) with the most prominent desquamation on her palms and soles. Her oral mucosa had superficial erosions on the tongue and hard palate, with hemorrhagic crusts on the lips. The diagnosis of TEN was confirmed by the skin biopsy.



**Figure 1.** (A) Three-month-old patient with toxic epidermal necrolysis. Vesiculobullous eruptions on the whole integument and cutaneous desquamation of soles. (B) Involvement of face and scalp. (C) Whole body dressing with Suprathel<sup>®</sup> and gauze with endotracheal tube, gastric tube, and urinary bladder catheter. (D) Patient with a very favorable resolution of skin lesions, two months after disease onset.

She was taken to the operating room where all detached epidermis was removed and the clean wounds on the extremities and trunk were covered with Suprathel® and a layer of paraffin and absorbent gauze, all together fixed with elastic net. Two days later, she had the development of new erosions on the scalp and larger and confluent lesions on the face and trunk with > 50% of TBSA affected and her body was completely wrapped in a Suprathel® dressing. The next wound dressing check took place after another four days in the operating room, leaving Suprathel® in situ where still attached. The skin lesions were completely healed and Suprathel® could be removed eight days after admission. The result of the healed skin lesions was very satisfactory, showing very discrete pigmentation anomalies of the skin and mild hyperhidrosis on the soles in a one-year follow-up.

### DISCUSSION

To our knowledge, this is the youngest patient reported in the literature who survived TEN. We used Suprathel® as a total body wound cover until the areas of skin loss were healed. It was a comfortable dressing for the patient and was readily accepted by the nursing staff caring for her. The ideal wound dressing must protect the wound, maintain physiologic environmental conditions for re-epithelization and give free movement; it must also be water vapor permeable to prevent maceration, nontoxic, nonadherent, durable, comfortable, easy to apply, and have an acceptable price. Suprathel® (PolyMedics Innovations, Filderstadt, Germany) is a synthetic copolymer mainly based on DL-lactide (> 70%) and  $\epsilon$ -caprolactone and is a nontoxic and biocompatible material. The final product is a porous membrane with the pore size between 2 and 50  $\mu$ m and the initial porosity of the membrane not only is > 80% water vapor permeable but also a barrier to external particles and microorganisms. It has great plasticity and adapts instantly to the wound surface at body temperature, allowing for use in critical areas like fingers, toes, and face. It enables a permanent covering of the wound until complete re-epithelization, adheres to the wound, becomes transparent, promotes healing, and proved to

reduce pain (7). After promising therapeutic applications in our burn children, we used Suprathel® very successfully in this patient with extensive skin loss. The handling of the patient who required ventilatory support and intensive care management was easier because of the whole body dressing. Hypothermia did not develop and the nurses' acceptance of the whole body dressing was outstanding. Based upon this report, further studies are warranted to evaluate the role of Suprathel® as a wound care option for infants with extensive skin loss because of TEN or Stevens-Johnson syndrome.

### DISCLOSURE

The authors have indicated, they have no financial relationships to this article to disclose and they do not have any relationship to the manufacturer of the described dressing.

### ACKNOWLEDGMENT

The authors like to thank Barbara Binder from the Department of Dermatology, Medical University of Graz, Austria for dermatologic work up.

### REFERENCES

1. Spies M, Sanford AP, Aili Low JF et al. Treatment of extensive toxic epidermal necrolysis in children. *Pediatrics* 2001;108:1162–1168.
2. Lohmeier K, Megahed M, Schulte KW et al. Toxic epidermal necrolysis in a premature infant of 27 weeks' gestational age. *Br J Dermatol* 2005;152:150–151.
3. Picard E, Gillis D, Klapholz L et al. Toxic epidermal necrolysis associated with *Klebsiella pneumoniae* sepsis. *Pediatr Dermatol* 1994;11:331–334.
4. Scully MC, Frieden IJ. Toxic epidermal necrolysis in early infancy. *J Am Acad Dermatol* 1992;27:340–344.
5. Hawk RJ, Storer JS, Daum RS. Toxic epidermal necrolysis in a 6-week-old infant. *Pediatr Dermatol* 1985;2:197–200.
6. de Groot R, Oranje AP, Vuzevski VD et al. Toxic epidermal necrolysis probably due to *Klebsiella pneumoniae* sepsis. *Dermatologica* 1984;169:88–90.
7. Uhlig C, Rapp M, Hartmann B et al. Suprathel®—an innovative resorbable skin substitute for the treatment of burn victims. *Burns* 2007;33:221–229.