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MatriDerm® Case

Adherent scar after extravasation of cytotoxic drugs

Type of Wound	Adherent scar after extravasation of cytotoxic drugs*
Etiology	Adherent scar over the flexor tendon of the hand after extravasation of cytostatics
Patient	57-year-old female

further information

Science you can feel

Our proprietary Advanced CryoSafe® Method preserves and refines the natural properties of biomaterials into science-based Med Care solutions. MatriDerm® based on TRC Technology is a dermal template enabling tissue regeneration in a One-Step Procedure.

TRC® TECHNOLOGY

medskin solutions
DR. SUWELACK

MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89603-001

MatriDerm® Case

Adherent scar after extravasation of cytotoxic drugs

As a side-effect of chemotherapy for breast cancer treatment in 2001, extravasation led to tissue necrosis on the back of the hand. The resulting adherent scar limited hand movement and caused pain. A release of the scar tissue and a tenolysis of the extensor tendon performed in 2002 did not improve pain and mobility.
Pre-operative view: A 4 cm long scar on the back of the hand with 5 cm wide atrophic and hyperpigmented skin around it. The skin had adhered to the underlying tissue and was not movable (Fig. 1). There was a marked limitation in flexion and extension mobility (Range of Motion: Flexion 40°, extension 30°), and ulnar and radial abduction (Range of Motion: Ulnar 25°, radial 5°).

After careful detachment of the skin from the tendons, a 1 mm rehydrated sheet of MatriDerm® was inserted between the layers (Fig. 2). An intra-cutaneous continuous suture was used for closure.
Post-operatively the wound site showed good vascularization without irritation. One year p. o. the patient is completely complaint-free with good movement of the skin over the underlying tissue. There is complete mobility of the hand (Range of Motion: Flexion 80°, extension 90°, ulnar 40°, radial 38°, (Fig. 3–5). The patient can clench her fist without any problems (Fig. 6) and can fully extend the hand (Fig. 7). The patient is very satisfied with the functional and aesthetic result.

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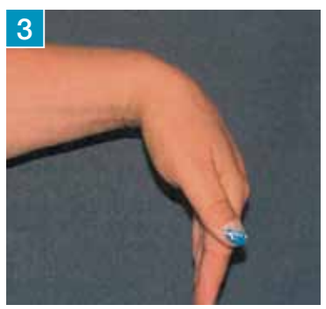

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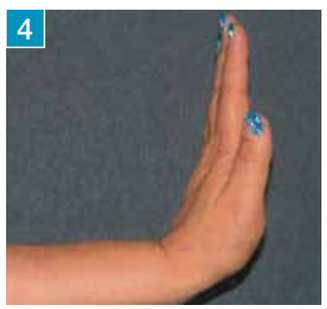

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* From Keck et al. 2008, Handchir Mikrochir Plast Chir; ©Thieme

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MatriDerm® Case

Treatment of adherent foot tendon

Type of Wound	Tenolysis*
Etiology	Tendon adhesion after foot surgery
Patient	63-year-old patient

further information

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medskin solutions
DR. SUWELACK

MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89595-001

MatriDerm® Case

Treatment of adherent foot tendon

Surgical approach at the musculus flexor digitorum brevis. Preparation and release of the adhesive tissue (Fig. 1). Gentle pull through of a small sheet of dry 1 mm MatriDerm® (Fig. 2 – 5). Wrapping of the tendon (Fig. 6). Final view before wound closure (Fig. 7). No reoccurrence of the claw toe and the patient no longer has an incorrect position and is able to wear his own shoes.

* Courtesy of U. Graf, MD, Zurich, Switzerland

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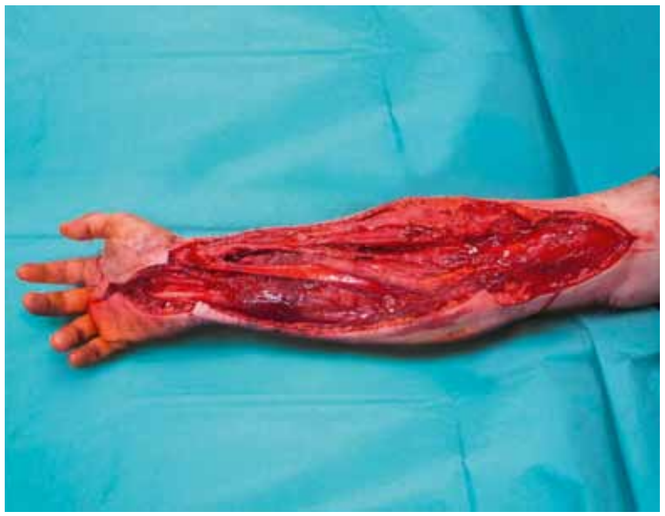
MatriDerm® Case

Degloving of the forearm in a work accident

Type of Wound	Avulsion injury*
Etiology	Avulsion with degloving of the upper extremity with release of compartments
Patient	20-year-old male



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DR. SUWELACK

MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89604-001

MatriDerm® Case

Degloving of the forearm in a work accident

The patient suffered from a work accident where his arm was crushed into an industrial roller, which resulted in multiple bone fractures and degloving of his right arm (Fig. 1).
Two days after the accident a fasciotomy was performed to release the compartment syndrome of the forearm and hand (Fig. 2). The defect was covered with Epigard to clean and condition the wound bed (Fig. 3).
Twelve days after the accident the debrided wound was covered with dry sheets of MatriDerm®, which were cut into shape to fit within the wound bed. MatriDerm® was rehydrated with sterile physiological saline (Fig. 4), immediately followed by placement of a meshed split-thickness skin graft on top of MatriDerm® in a One-Step Procedure (Fig. 5). Negative pressure wound therapy was initiated post-surgery.
At the follow-up visit three weeks later, stable wound closure with complete integration of the skin graft was observed (Fig. 6, 7). The patient had good initial mobility of his elbow and wrist. Five months later the patient was back at work.

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* Courtesy of M. Kerl, MD, Graz, Austria

Epigard by Biovision GmbH

MatriDerm® Case

Degloving injury at lower leg

Type of Wound	Significant soft tissue loss of the left lower leg and foot with visible tendons and periosteal structures of the medial ankle*
Etiology	Degloving injury
Patient	71-year-old male

further information

Science you can feel

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TRC® TECHNOLOGY

MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89590-001

MatriDerm® Case

Degloving injury at lower leg

This 71-year-old patient suffered a degloving injury of the left lower leg and foot (Fig. 1). After operative debridement, there was significant soft tissue loss with visible tendon and periosteal structures of the medial ankle (Fig. 2). Angiography showed that the lower leg and foot were only being nourished by an arteriosclerotic tibialis posterior artery.

Defect coverage was performed using 1 mm MatriDerm® (Fig. 3) in a One-Step Procedure with unmeshed split skin grafts in combination with one week of negative pressure wound therapy to fix the grafts (Fig. 4).

With this procedure the leg could be saved and showed a stable wound closure – one month p. o. (Fig. 5). Two years after the accident the patient was able to wear normal shoes and clinical gait analysis demonstrated a perfect functional outcome (Fig. 6). The patient refused to have any further procedure done to improve the aesthetic outcome.

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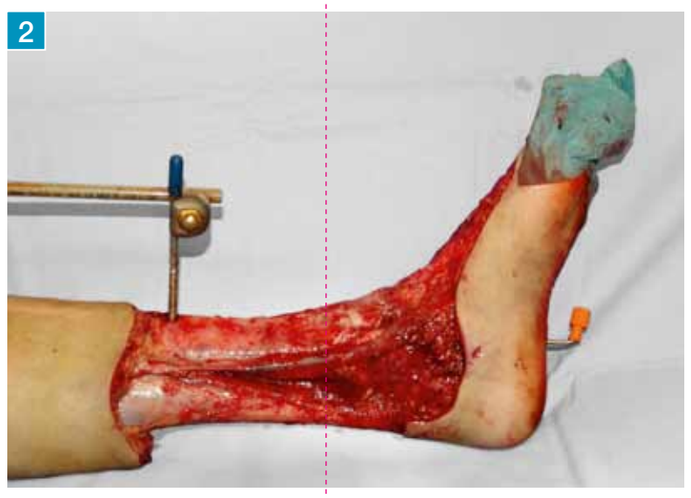

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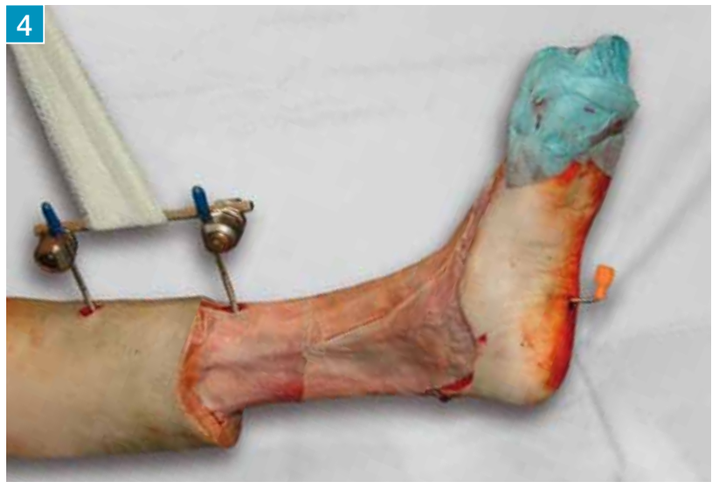

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* Courtesy of M. Öhlbauer, MD, Murnau, Germany

MatriDerm® Case

Crush trauma by a school bus

Type of Wound	Deep soft tissue defect with involvement of the fascia, right lower leg*
Etiology	Crush trauma by a school bus
Patient	7-year-old boy

further information

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TRC® TECHNOLOGY

MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89593-001

MatriDerm® Case

Crush trauma by a school bus

The patient was transferred to a special trauma clinic on day 5 post injury. Two-thirds of the proximal lower leg showed necrotic tissue (Fig. 1). Parts of the lower leg fascia were destroyed. After debridement vital paratenon at the tibia was exposed (Fig. 2). The tissue defect was covered with 1 mm MatriDerm® and unmeshed split-thickness skin graft in a One-Step Procedure (Fig. 3, 4). Fixation was performed by negative pressure wound therapy for 1 week. Thereafter conventional dressing (fatty gauze / bulky gauze / tight bandaging) was performed and the wound healed quickly without any complications. Aftercare with compression garments. Good functional and aesthetic result was achieved. Fig. 5: 18 months after injury. The transplanted skin was pliable and soft so that the patient was able to return to normal life. 7 years after the surgery the aesthetic outcome has further improved (Fig. 6). No scar contracture release surgeries have ever been necessary because the new skin has grown naturally along with the boy's legs.


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* Courtesy of M. Öhlbauer, B. Wallner and M. Militz, MD, Murnau, Germany

MatriDerm® Case

Avulsion injury at the foot with exposed Achilles tendon

Type of Wound	Soft tissue defect at the heel with exposed Achilles tendon *
Etiology	Avulsion at the right foot after motor-bike injury
Patient	60-year-old patient

In this case a 60-year-old patient was hospitalized with an acute avulsion after motor-bike injury. The intra-operative view revealed a defect at the heel and a 2 cm exposed Achilles tendon (Fig. 1). The wound was treated with 1 mm MatriDerm® and unmeshed split-thickness skin graft in a One-Step Procedure. 2.5 weeks later the wound area showed a closed skin with good tendency to heal (Fig. 2). The physiotheraphy started at this stage. A follow up of 5 weeks p. o. demonstrated a good development with a completely stable wound also over the Achilles tendon (Fig. 3, 4).

* Courtesy of U. Graf, MD, Zurich, Switzerland

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medskin solutions
DR. SUWELACK

MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89592-001

MatriDerm® Case

Infected dog bite at the dorsum of the hand

Type of Wound	Infected, necrotic full-thickness wound*
Etiology	Dog bite
Patient	64-year-old female

further information

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MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89597-001

MatriDerm® Case

Infected dog bite at the dorsum of the hand

After one month of pre-treatment of a dog bite in a general hospital (three sessions of debridement, splinting of the fascia and negative pressure wound therapy) the patient was transferred to a specialized clinic with plastic and reconstructive surgery. Pre-operative view, 4 weeks after injury: Wound bed was still necrotic (Fig. 1). Day 0: Wide and deep excision of the wound to avoid further complications (Fig. 2). After preparation of an adequate wound bed, dry 1 mm MatriDerm® was applied to the wound (Fig. 3). After rehydration of MatriDerm® a meshed split-thickness skin graft was applied in a One-Step Procedure (Fig. 4). Fixation was performed by sutures. The wound dressing consisted of fatty gauze, bulky dressing and tight bandaging. Day 6 p. o.: First dressing change with a stable wound and excellent take of the autograft (Fig. 5). 3 months p. o.: Stable wound closure of the hand (Fig. 6). 2 years follow-up: The long-term result demonstrated full range of motion of the hand and a good aesthetic outcome (Fig. 7 – 9).

* Courtesy of U. Hug, MD, Luzern, Switzerland

MatriDerm® Case

Deglovement instep and plantar regions after motor-bike injury

Type of Wound	Deep soft tissue defect on the instep and plantar regions*
Etiology	Motor-bike injury with deglovement
Patient	45-year-old male

further information

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MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89607-001

MatriDerm® Case

Deglovement instep and plantar regions after motor-bike injury

One week after motor-bike injury the traffic victim was transferred to a specialized trauma hospital with deep soft tissue loss on the instep and sole of the foot (Fig. 1, 2). Debridement was performed including amputation of the necrotic first toe (Fig. 3). Wound closure was achieved by using 1 mm MatriDerm® in combination with unmeshed split-thickness skin graft in a One-Step Procedure (Fig. 4, 5).

Fixation was performed with vacuum therapy for 1 week. Excellent take rate at the first dressing change (Fig. 6, 7). A small hematoma under the graft was associated with the vacuum base and can be avoided by bringing the vacuum base outside the wound area. However, this did not compromise the take. Follow-up 3 months later showed a completely healed foot with excellent elasticity of the new skin (Fig. 8).

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* Courtesy of M. Öhlbauer, B. Wallner and M. Militz, MD, Murnau, Germany

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MatriDerm® Case

Circular saw injury

Type of Wound	Severe soft tissue defect of the left hand*
Etiology	Circular saw injury, no co-morbidities
Patient	40-year-old male

further information

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medskin solutions
DR. SUWELACK

MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89598-001

MatriDerm® Case

Circular saw injury

Initial view of the circular saw injury at the hand showing a deep soft tissue defect with involvement of the auricular and the annular finger (Fig. 1). Based on the bone status a partial amputation to the mid-joint of the auricular finger was necessary. The wound closure was done with a retrograde pedicular forearm flap. Three days later the flap suffered from a necrosis caused by a septal vascular anomaly (Fig. 2). 13 days after injury: Second surgery was required due to the flap loss.

Day 0: Preparation and coverage of the wound with a new local flap complemented by 1 mm MatriDerm® in combination with unmeshed split-thickness skin graft in a One-Step Procedure (Fig. 3, 4). 5 days p. o.: First dressing change showing a little wound edge necrosis of the local flap and good take of the split-skin transplant with vital coloration (Fig. 5). 4 weeks p. o.: Secondary healing of the flap and stable wound closure (Fig. 6). 6 months p. o.: Good wound closure with normal skin elasticity and functionality in the reconstructed area (Fig. 7, 8).

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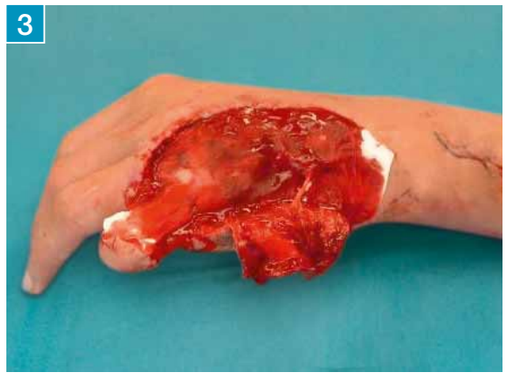

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* Courtesy of L. Mathys, MD, Bern, Switzerland

MatriDerm® Case

Hand scar revision after burn

Type of Wound	Contractile scar revision after burn Injury*
Etiology	Hypertrophic and contractile scar after 3rd degree flame burn of the right hand. Pronounced hyperextension of the metacarpophalangeal (MCP) joint and complete stiffness of the wrist.
Patient	Young female

further information

Science you can feel

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MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

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MatriDerm® Case

Hand scar revision after burn

Pre-operative: Hyperextension of the MCP joint – function is considerably limited (Fig. 1). Fist closure is not possible (Fig. 2). Intra-operative: Complete excision of the scar tissue (Fig. 3). Intra-operative: The scar tissue – laid back onto the wound bed for the photo – reveals the dimension of the scar contraction, the skin deficit and the substantial functional limitation (Fig. 4). Long-term follow-up: Normal function of the hand without any limitations (Fig. 5 – 7).

* Courtesy of L. Kamolz, MD, Graz, Austria

MatriDerm® Case

Revision surgery of burn scar at the lower limb

Type of Wound	Burn sequela – unstable scar and functional impairment due to contractures*
Etiology	Flame burn in childhood (at age 8)
Patient	27-year-old female

further information

Science you can feel

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MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89600-001

MatriDerm® Case

Revision surgery of burn scar at the lower limb

Aspect of the wound before operation (Fig. 1, 2). Pre-operative marking of the area to be excised (Fig. 3). Aspect of the wound after scar resection with release of healthy tissue. In order to show the extend of contracture release the scar tissue was put back onto the wound bed for this photo (Fig. 4). Application of MatriDerm® (Fig. 5), covered with fenestrated split-thickness skin graft (Fig. 6). Negative pressure wound therapy as dressing (Fig. 7). Result after 2 weeks (Fig. 8). Result after 3 months (Fig. 9). Result 1 year later (Fig. 10, 11). Pleasing functional and aesthetic outcome with full pain release. Complete and stable healing of the wound.

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* Courtesy of A. Modarressi, MD, Geneva, Switzerland

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MatriDerm® Case

Chronic venous ulcer with 3.5 years follow-up

Type of Wound	Chronic venous ulcer*
Etiology	Venous insufficiency with 5-year open wound on the medial and lateral side of the lower left leg
Patient	51-year-old male

further information

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DR. SUWELACK

MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89602-001

MatriDerm® Case

Chronic venous ulcer with 3.5 years follow-up

On first examination the wound bed appeared fibrinous and was covered with a yellowish layer, but there were no signs of necrotic tissue (Fig. 1). The wound bed was treated with non-adherent gauze for 6 months prior to surgery. Antibiotics were administered and the wound was cleansed once with chlorhexidine.
During the surgery the wound bed was properly debrided (Fig. 2) prior to dry application of 1 mm MatriDerm®. The matrix was rehydrated inside the wound bed (Fig. 3). MatriDerm® was covered in a One-Step Procedure with a 0.010 inch, unmeshed, fenestrated split-thickness skin graft (STSG) (Fig. 4).
MatriDerm® and the STSG were fixated with 6 layers of fatty gauze and V.A.C. therapy with the GranuFoam dressing was applied for 5 days (100 mmHg, continuous negative pressure) (Fig. 5).
At 14 days p. o.the take rate of the STSG was 95 % and at 1 month the skin graft was completely integrated with full and stable wound closure, and the patient was able to wear compression socks for his venous insufficiency.
3.5 years follow-up showed very stable wound closure with good aesthetic outcome. The wound edges are leveled with the surrounding healthy tissue (Fig. 6) and the patient has full functional results with extension and flexion of his leg (Fig. 7, flexion). Excellent wound elasticity and pliability was achieved (Fig. 8).

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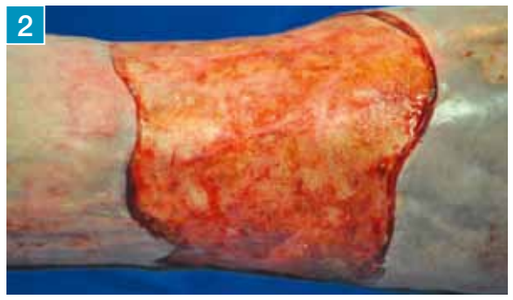

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* Courtesy of F. Tostes, MD, Rio Grande do Sul, Brazil

V.A.C. therapy and GranuFoam by Kinetic Concept, Inc (KCI)

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MatriDerm® Case

Chronic diabetic ulcer at clubfoot

Type of Wound	Chronic diabetic foot ulcer*
Etiology	Neuropathic cavoid foot; idiopathic clubfoot; chronic infected ulceration
Patient	47-year-old male

further information

Science you can feel

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DR. SUWELACK

MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89601-001

MatriDerm® Case

Chronic diabetic ulcer at clubfoot

This patient with a neuropathic cavoid foot and an idiopathic clubfoot has a 4-year history of infected ulcerations on the plantar and lateral dorsal side of the foot. In the weeks prior to the reconstructive surgery, the Pseudomonas-infected ulcer was treated with MediHoney to control the infection. The wound bed was optimized with Hyiodine.

At the day of surgery, the infection was resolved and the wound size was reduced. The ulcer was thoroughly debrided resulting in a well vascularized wound bed (Fig. 1, 2). MatriDerm® was applied and in a One-Step Procedure covered with a meshed split-thickness skin graft which was sutured to the wound edges (Fig. 3). Negative pressure wound therapy was initiated to immobilize the graft (Fig. 4). At the fifth p. o. day, signs of initial graft integration were observed (Fig. 5). At 6 months p. o. the wound was completely closed with good tissue elasticity and mobility (Fig. 6). The patient was pain free.

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* Courtesy of H. Mössner, MD, Salzburg, Austria

Medihoney by Derma Sciences, Inc

Hyiodine by Contipro Group s.r.o.

MatriDerm® Case

Chronic mixed ulcer in diabetic patient

Type of Wound	Chronic mixed ulcer of the forefoot*
Etiology	Diabetic patient with mixed ulcers repeatedly covered with split skin
Patient	70-year-old patient

The 70-year-old patient suffers from a mixed chronic ulcers. The wound bed was debrided and conditioned for 2–3 weeks (Fig. 1).
Afterwards 1 mm MatriDerm® was applied in a One-Step Procedure (Fig. 2) with unmeshed split-thickness skin on top of the matrix (Fig. 3). After fixation with a vacuum system the wound was closed in 1 week after the surgical procedure (Fig. 4). Fig. 5 shows a stable result already in week 2 p. o.

* Courtesy of M. Öhlbauer, MD, Murnau, Germany

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MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck I Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89591-001

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MatriDerm® Case

Large pressure ulcer after an ischaemic stroke

Type of Wound	Large pressure ulcer of the left thorax and the lateral side of the left knee*
Etiology	Ischaemic stroke, lying on the floor for 4 days
Patient	70-year-old male

A 70-year-old patient suffered from an ischaemic stroke at home. He was found 4 days later lying on the floor unable to move and had developed large pressure ulcers of the left thorax and the lateral side of the left knee. After cardiopulmonary stabilisation at the intensive care unit, operative debridement of the necrotic tissue exposed both knee capsule and rib cartilage.

Fig. 1, 2 shows the left knee and left side of the thorax one week after initial debridement and the use of negative pressure wound therapy (NPWT) to obtain proper granulation of the wound beds.

Defect coverage was performed in a One-Step Procedure with 1 mm MatriDerm® and unmeshed split skin grafts. NPWT was then used to encourage optimum fixation of the MatriDerm® and split-thickness skin grafts. This was discontinued after one week.

Besides optimal graft take, MatriDerm® provided reliable defect coverage (Fig. 3, 4).

* Courtesy of M. Öhlbauer, MD, Murnau, Germany

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TRC® TECHNOLOGY

medskin solutions
DR. SUWELACK

MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck I Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89589-001

medskin solutions
DR. SUWELACK

MatriDerm® Case

Exposed dura mater after carcinoma resection

Type of Wound	Exposed dura mater after carcinoma resection*
Etiology	Recurrence after squamous cell carcinoma resection on the scalp
Patient	76-year-old male

further information

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E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89606-001

medskin solutions
DR. SUWELACK

MatriDerm® Case

Exposed dura mater after carcinoma resection

This 76-year-old co-morbid patient underwent excision of a squamous cell carcinoma on the scalp, hereafter the defect was covered with a skin graft. Unfortunately the skin graft failed with simultaneous display of Bowen's disease. At the subsequent surgical revision the defect was covered with a proximity flap. One year later the patient presented with a loss of substance. Integra DL was used in a two-stage grafting procedure directly over the periosteum. This third surgery failed a few weeks later, demonstrating progressive rejection of the thin skin graft with concurrent necrosis of the cranial bone (Fig. 1).

During the following surgery the widespread bone necrosis was resected up to the dura mater and the margins of the skin lesion were revised (Fig. 2). MatriDerm® was placed directly over the exposed dura followed by a thin split-thickness skin graft, in a One-Step Procedure (Fig. 3). The graft was secured in position using interrupted sutures (Fig. 4).

A semi-occlusive compression dressing was used to keep the skin graft in place. After 5 days the dressing was removed and a more than 95 % take rate of the graft was observed.

Three months p. o. the defect showed stable wound closure with complete graft integration (Fig. 5). The wound bed demonstrated areas with radiation dermatitis which were resolved by using ointments.

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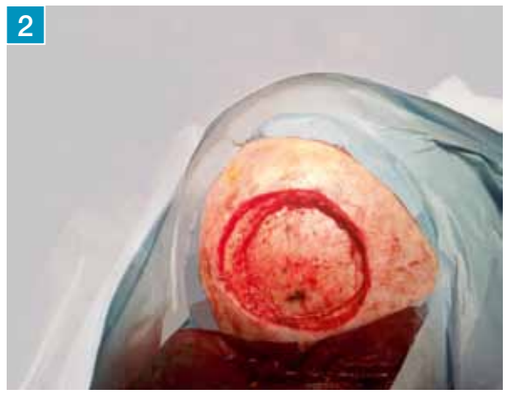

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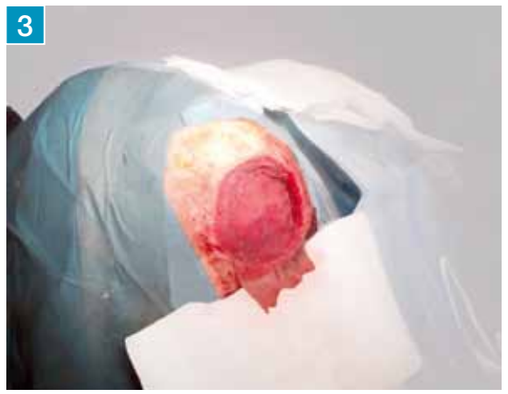

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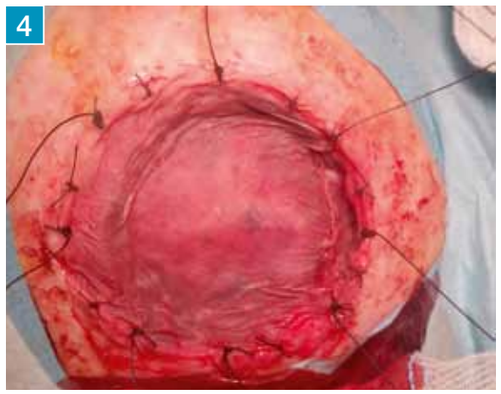

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* Courtesy of F. D'Andrea, MD, Napels, Italy

Integra DL by Integra LifeSciences Corporation

MatriDerm® Case

Carcinoma resection in 97-year-old patient

Type of Wound	Resection of squamous cell carcinoma*
Etiology	Fungating spinalioma cranium
Patient	97-year-old male

This 97-year-old patient, with a history of diabetes type II, presented with a fungating spinalioma on the cranium (Fig. 1). One day pre-operatively the lesion was covered with a betadine dressing.
A wide resection of the carcinoma with a 2 cm safety margin was performed. This resulted in a 6 x 7 cm defect on the frontal side of the cranium (Fig. 2). Subsequently MatriDerm® and a split-thickness skin graft were applied on the defect in a One-Step Procedure. The surgical site was dressed with vaseline gauze and foam dressing, which were left in place for 5 days. At 1 week p. o. a 85 % take rate of the skin graft was observed, and 2 months p. o. the take rate was 100 %. At the follow-up visit after one year complete healing was observed with an excellent aesthetic result (Fig. 3).

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* Courtesy of V. Wedler, MD, Frauenfeld, Switzerland

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DR. SUWELACK

MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck I Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89605-001

MatriDerm® Case

Basal cell carcinoma excision in face

Type of Wound	Surgical full-thickness wound*
Etiology	Basal cell carcinoma
Patient	42-year-old female

further information

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MedSkin Solutions Dr. Suwelack AG
Josef-Suwelack-Strasse
48727 Billerbeck | Germany

P +49 (0) 2543 2182-0
E info@medskin-suwelack.com
W www.medskin-suwelack.com

material number 89596-001

MatriDerm® Case

Basal cell carcinoma excision in face

Day 0: R0-excision of the carcinoma (Fig. 1). The intra-operative view showing the dry application of 1 mm MatriDerm® on the wound bed fixed with normal sutures (Fig. 2). Immediate coverage of MatriDerm® with a fenestrated split-thickness skin graft in a One-Step Procedure (Fig. 3). Afterwards the wound dressing was performed by using fatty gauze, bulky dressing and tight bandaging.

Day 14 p. o.: The post-operative view shows a complete wound closure with a full graft take of the transplant (Fig. 4). Follow-up 7 months: The reconstructed skin demonstrated excellent elasticity and pliability, characteristics seen by the facial movement of this skin region (Fig. 5–8). The surgeon as well as the patient were satisfied with the functional and aesthetic outcome in this special body region.

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* Courtesy of N. Lilgenau, MD, Vienna, Austria