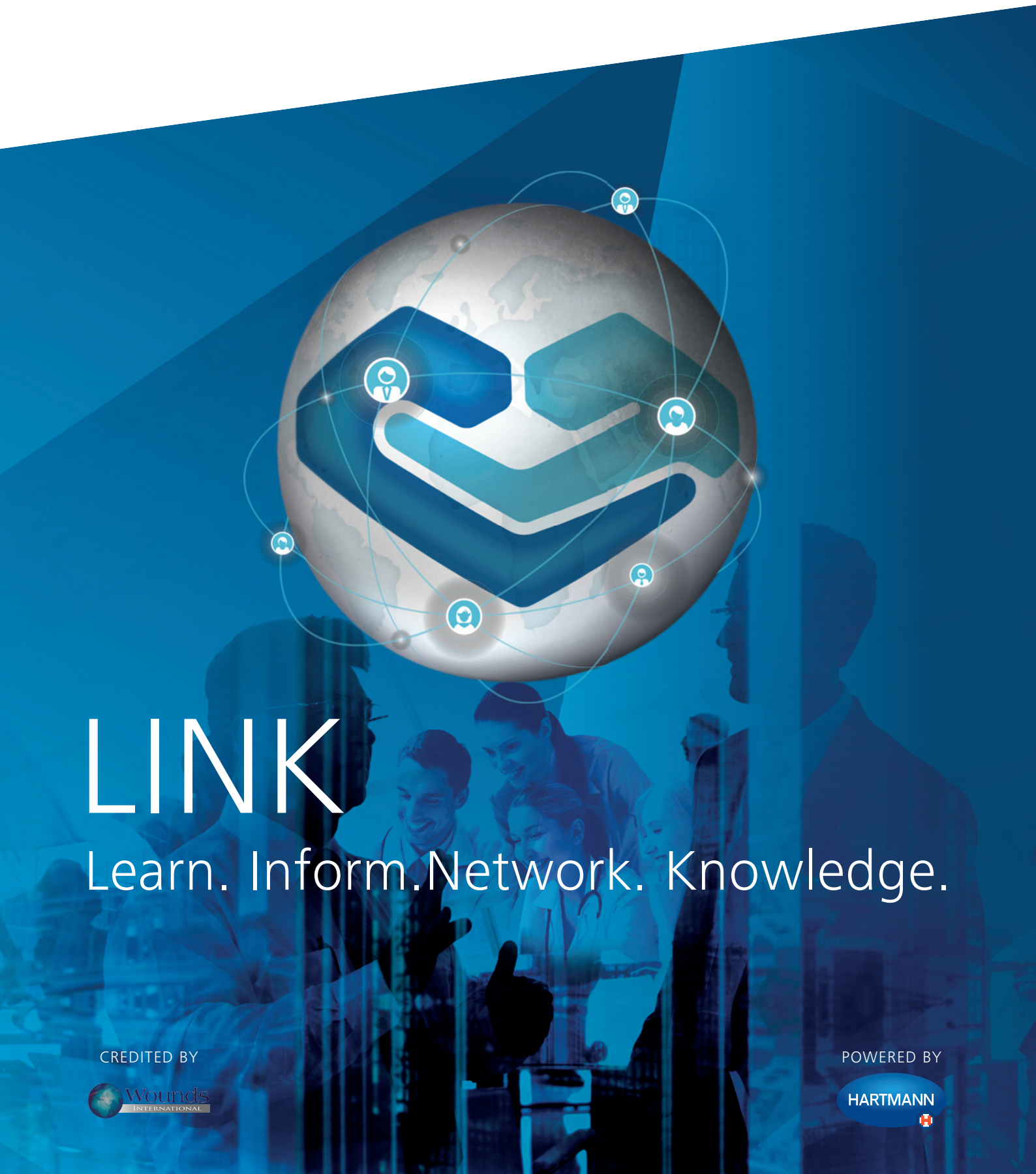
LINK Wound Healing CONGRESS 2019



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Welcome

Wounds International and PAUL HARTMANN AG are delighted to welcome you to the second LINK for Wound Healing Congress, which will take place on 11th September 2019 in Budapest, Hungary.

It represents a unique opportunity for delegates to engage with key opinion leaders from all over the world in the fields of advanced wound healing and negative pressure wound therapy (NPWT). Is it therefore an unparalleled chance to chart the progress in both areas that has been well documented over the past few years.

This year the congress will focus on two main areas. Firstly, clinical challenges and therapeutic updates in Wound Exudate Management and secondly on Epithelialization. Both topics will be looking on newest guidelines/studies, scientific research and clinical approaches.

We believe this is an exceptional occasion to fully understand the challenges in wound healing and discuss the different perspectives from which these could be addressed.

With warm regards,
Wounds International and PAUL HARTMANN AG

Conference information

Tuesday 10th September
16:00 – 19:00 Registration, Hotel Helia

Wednesday 11th September
08:00 – 09:00 Registration
09:00 – 09:10 Words of Welcome from HARTMANN
09:00 – 11:20 Plenary session
11:20 – 17:30 Sessions on Exudate Management & Epithelialization
19:00 – 22:00 Congress Dinner & Award Ceremony for the best scientific contribution

Congress venue: Danubius Hotel Helia, 62-64. Kárpát utca, 1133 Budapest, Hungary

Congress dinner venue: Európa Boat, Műegyetem pier, Műszak egyetem, 1111 Budapest, Hungary

Photos and filming

A photographer will be taking pictures for the duration of this LINK Wound Healing Congress. These pictures will be used across the internet and social media platforms. For this purpose, only group and ambiance pictures will be used.

If you do not want your photo to be used in this manner, please inform the organizers (Heike Schulz, +49 173 34 71674, heike.schulz@hartmann.info) or your country representative.

Programme overview

	Helia room	Panorama room
09:00-09:10	**Welcome word**; *Francois Georgelin*	
09:10-09:20	**Introduction**; *Prof. Hans Smola*	
09:20-10:50	**Exudate Management** **Exudate management: recent updates and practical guidelines**; *Prof. Marco Romanelli, IT* **Effects of exudate physical, chemical and thermal conditions on collective migration of tissue-repairing cells: Mechanobiological studies**; *Prof Amit Gefen, ISR* **Ideal dressing characteristics in exudate management of diabetic foot ulceration**; *Prof. Paul Chadwick, UK* **Challenges of wounds with high exudation - polyacrylate polymers dressings put them in use!**; *Gulnaz Tariq, UAE* Q&A (10 min)	
10:50-11:20	**Coffee Break**	
11:20-12:50	**Exudate Management** **The importance of a multidisciplinary team approach in the exudate management of patients with hard-to-heal wounds and the use of Zetuvit Plus Silicone**; *Astrid Probst, DE* **The management of exudate in case of lymphedema**; *John Schäfer, Myriam Seitert, DE* **The reduction of edema using compression and superabsorbents are important components of exudate management**; *Carsten Hampel-Kalthoff, DE* **Use of the superabsorbent wound dressing Zetuvit Plus in the management of deep burn wounds**; *Malyutina Borisovna, Andrej Alekseev, RU* Q&A (10 min)	**NPWT** **Exudate management and NPWT**; *Lenka Veverková, et al, CZ* **Exudate management with NPWT in mesh suppuration after abdominal wall reconstruction with mesh**; *Zsolt Szentkereszty, HU* **Complex wound care and exudate management using NPWT during abdominal compartment syndrome caused by acute pancreatitis**; *Laszlo Venczel, Laszlo Silorszki, HU* **Management of refractory ascites using NPWT. A pilot study**; *Romane Hurel, et al, FR* Q&A (10 min)
12:50-14:00	**Lunch break & poster viewing**	
14:00-14:20	**Exudate Management** **Lymphorrhea as a largely under-recognized problem in exudate management of chronic wounds**; *Judit Daróczy, HU*	**NPWT** **Prophylactic ciNPWT for high-risk laparatomy wounds. Preliminary results of a multi-centre randomised controlled trial**; *Balazs Banky, et al, HU* **Management of pediatric extravasation injuries with NPWT**; *Marie-Christine Planq, FR* **Combined NPWT and Omental Flap for prostethic femoropopliteal Graft salvage**; *Alex Carap et al, RO* **Enterocutaneous fistula: How to efficiently control the enteric effluent using NPWT. Recommendations, tricks and tips and own experience**; *Adam Bobkiewicz, PL* Q&A (10 min)
14:20-15:30	**Epithelialization** **Keratinocytes under the spotlight: Epithelialization process is essential for wound healing**; *Marjana Tomic-Canic, US* **Clinical assessment of a foam dressing containing growth factor-enhancing hydrated polyurethanes**; *Hans Smola, DE* **An easy manner to manage second degree burns in children**; *Franck Duteille, FR* Q&A (10 min)	
15:30-16:00	**Coffee Break**	
16:00-17:15	**Epithelialization** **Superficial cutaneous burn care: The impact of a new management protocol**; *Jean Sende, et al FR* **My check-list - How I use the HydroTac system. Practical aspects from the surgeon's point of view**; *Istvan Rozsos, et al, HU* **Our experience in wound care products - case series**; *Alper Sener, et al, TK* Q&A (10 min)	**NPWT** **Application of NPWT in complex wounds in the Vascular Surgery Service of Centro Hospitalar Lisboa Norte (CHULN) - Portugal. Case report of a patient with traumatic injuries in both lower limbs**; *Ana Almeida, PT* **Prophylactic NPWT in vulvar carcinoma**; *Emilie Raimond, et al, FR* **NPWT-induced effective wound healing in the treatment of vascular graft infections**; *Melinda Gadacsi et al, HU* Q&A (10 min)
17:15	**CLOSING**; *Prof. Hans Smola, DE*	**CLOSING**; *Prof. Tomasz Banasiewicz, PL*

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[1] Data on file: 27. Z+SilBorder_benchmark. **[2]** Data on file: Dressing Heat and Water Vapor Report 20.07.2018. **[3]** World Union of Wound Healing Societies (WUWHS) Consensus Document. Wound Exudate: effective assessment and management Wounds International, 2019. **[4]** Davies, LO, Rippon MG and Westgate SJ (2017). Odour Sequestration Properties of Superabsorbent Dressings Perfectus Paper 2017: Poster presented at Wounds UK. Harrogate, UK. **[5]** Data on file: 27. Z+SilBorder_ Add_Feat_adhesiveness assessment.

Oral presentations overview

Exudate Management

Exudate management: recent updates and practical guidelines, *Marco Romanelli*

Effects of exudate physical, chemical and thermal conditions on collective migration of tissue-repairing cells: Mechanobiological studies, *Amit Gefen*

Ideal dressing characteristics in exudate management of diabetic foot ulceration, *Paul Chadwick*

Challenges of wounds with high exudation - polyacrylate polymers dressings put them in use!, *Gulnaz Tariq*

The importance of a multidisciplinary team approach in the exudate management of patients with hard-to-heal wounds and the use of Zetuvit Plus Silicone, *Astrid Probst*

The management of exudate in case of lymphedema, *John Schäfer, Myriam Seiter*

The reduction of edema using compression and superabsorbents are important components of exudate management, *Carsten Hampel-Kalthoff*

Use of the superabsorbent wound dressing Zetuvit Plus in the management of deep burn wounds, *Malyutina Borisovna, Andrej Alekseev*

Lymphorrhea as a largely under-recognized problem in exudate management of chronic wounds, *Judit Daróczy*

Epithelialization

Keratinocytes under the spotlight: Epithelialization process is essential for wound healing, *Marjana Tomic-Canic*

Clinical assessment of a foam dressing containing growth factor-enhancing hydrated polyurethanes, *Hans Smola*

An easy manner to manage second degree burns in children, *Franck Duteille*

Superficial cutaneous burn care: The impact of a new management protocol, *Jean Sende, et al*

My check-list - How I use the HydroTac system. Practical aspects from the surgeon's point of view, *Istvan Rozsos, et al*

Our experience in wound care products - case series, *Alper Sener, et al*

NPWT

Exudate management and NPWT, *Lenka Veverková, et al*

Exudate management with NPWT in mesh suppuration after abdominal wall reconstruction with mesh, *Zsolt Szentkereszty*

Complex wound care and exudate management using NPWT during abdominal compartment syndrome caused by acute pancreatitis, *Laszlo Venczel, Laszlo Silorszki*

Management of refractory ascites using NPWT. A pilot study. *Romane Hurel, et al*

Prophylactic ciNPWT for high-risk laparatomy wounds. Preliminary results of a multi-centre randomised controlled trial, *Balazs Banky, et al*

Management of pediatric extravasation injuries with NPWT, *Marie-Christine Planq*

Combined NPWT and Omental Flap for prostethic femoropopliteal Graft salvage, *Alex Carap et al*

Enterocutaneous fistula: How to efficiently control the enteric effluent using NPWT. Recommendations, tricks and tips and own experience. *Adam Bobkiewicz*

Application of NPWT in complex wounds in the Vascular Surgery Service of Centro Hospitalar Lisboa Norte (CHULN) - Portugal. Case report of a patient with traumatic injuries in both lower limbs, *Ana Almeida*

Prophylactic NPWT in vulvar carcinoma, *Emilie Raimond, et al*

NPWT-induced effective wound healing in the treatment of vascular graft infections, *Melinda Gadacsi et al*

Exudate management: recent updates and practical guidelines

Marco Romanelli[1]

1 *University of Pisa, Department of Dermatology, Pisa, Italy*

Aim: Exudate plays a key role in wound healing. However, exudate can delay healing when in the wrong amount, in the wrong place, or of the wrong composition. Effective assessment and management of exudate is therefore key to ensuring timely wound healing without complications.

Key Points: Wound exudate is produced as a natural and essential part of the healing process. However, overproduction of wound exudate, in the wrong place or of the wrong composition, can adversely affect wound healing.

The amount of exudate produced by a wound is dependent on:

- Wound aetiology – some wound types are more prone to high or low exudate levels
- Wound healing phase – the amount of exudate produced by a wound usually diminishes as healing progresses
- Wound size, depth and position – larger and deeper wounds may produce higher levels of exudate, as can wounds in dependent parts of the body, e.g. the lower leg
- Comorbidities, complications and other factors – there are many other reasons for increased or decreased exudate production

Excessive exudate production can be associated with a wide range of problems. Leakage and soiling can be particularly distressing to patients and carers, and can be burdensome because of increased needs for washing of clothing and bed linen. Leakage or strikethrough may result in odour (which is sometimes, but not always, a sign of increased wound bioburden or infection). Leakage/strikethrough may also increase the risk of infection by providing a route by which micro-organisms can enter the wound.

Frequent dressing changes may be required to ensure containment of the exudate or to monitor the wound. Frequent dressing change may also be of benefit in preventing potential infection and biofilm formation. However, frequent dressing changes may be taxing and distressing to the patient, especially if associated with pain, and can cause wound bed or periwound skin damage. Consequently, further studies investigating the potential impact and benefits of increased dressing change frequency and positive clinical outcomes are required. Other causes of discomfort and pain in patients with an excessively exuding wound include periwound skin damage and a ‘drawing’ pain sometimes produced by dressings with a high rate of absorbency, especially when used in wounds where levels of exudate is decreasing. High levels of exudation may also result in significant protein loss and put the patient at risk of fluid/electrolyte imbalance. For example, it has been estimated that a patient with a Category/Stage IV pressure ulcer (i.e. a pressure injury with full thickness tissue loss with exposed bone, tendon or muscle), could lose 90–100g/day of protein in exudate. This is more than the recommended daily intake of protein for many adults. Excessive exudate can have a serious psychosocial impact on patients and reduce quality of life. For example, patients’ work, social and home lives may be disrupted by dressing changes or by fear and embarrassment related to leakage or odour, which can prevent patients from leaving their homes.

Effects of exudate physical, chemical and thermal conditions on collective migration of tissue-repairing cells: Mechanobiological studies

Amit Gefen[1]

1 *Faculty of Engineering, Tel Aviv University, Vascular Bioengineering Department of Biomedical Engineering, Tel Aviv, Israel*

Aim: As a result of the increased vascular permeability which is part of the natural inflammatory process, fluids continuously enter the wound bed. These fluids, termed exudate, may contain proteins, nutrients, inflammatory mediators, digestive enzymes, growth factors, waste products, immune cells (primarily neutrophils and macrophages) and platelets. The exudate plays several critical roles in healing, specifically in: (i) protecting the wound bed from drying out, (iii) facilitating diffusion and transport of nutrients, signaling molecules and growth factors, and (iii) allowing migration of tissue-repairing cells. Related to the latter point, our objective was to determine how collective cell migration is affected by the conditions and properties of the exudate.

Methods: We used a cell culture model to determine the effects of low temperature (35°C versus 37°C), low glucose (1g/L versus 4.5 g/L) and low pH (6.7 versus 7.6) which are common in exudates, on collective migration patterns of tissue-repairing cells. We studied NIH3T3 fibroblasts, 3T3L1 preadipocytes and C2C12 myoblasts which are associated with the tissues affected by chronic wounds, i.e. skin, adipose and skeletal muscle, respectively. Cell migration into a local damage site in the cultures, produced by crushing cells under a micro-indentor, was monitored over a day under the above altered conditions, using our dedicated image processing technology for analyzing collective migration. Work to integrate these altered physical, chemical and thermal conditions that are characteristic to chronic wounds with a custom-made, instrumented cell stretching device (CSD) which simulates deformation effects of negative pressure wound therapy (NPWT) at a cell level, is underway.

Results: The present mechanobiological approach and methodologies, combining the CSD apparatus and image processing algorithms, are powerful in identifying the ideal conditions and properties of exudates. First, migration rates and times differ significantly across cell types. Second, under static culture conditions, which do not incorporate mechanical stimuli by NPWT, acidic exudate conditions significantly impede collective migration of fibroblasts, and consistently delay the times for onset and end of the en mass migration of these cells. The effects of low temperature and glucose, however, were not significant on any cell type under the static loading mode. Recent preliminary data shows that simulated NPWT conditions impact proliferation and migration rates of the aforementioned cells, depending on the magnitude and waveform of the applied deformations.

Conclusion: Wound exudate should not be seen as merely a clinical management problem. The exudate has key functions in the healing process, and its composition and properties specifically influence migration of tissue-repairing cells in the wound bed. The mechanobiological research approach and the methods described above are able to provide objective, quantitative and standardized indicators of whether the composition and properties of specific exudates are conducive to healing.

Clinical relevance: Moist wound healing is warranted, but the exudate needs to have optimal properties for efficient tissue repair. Future exudate management should focus on proactively altering the composition and properties of the exudate in the wound bed, if and as needed, e.g. to accelerate cell migration towards epithelization and formation of granulation tissue, in order to promote healing. This can be done by means of 'active' smart dressings, which can be used for more than just fluid retention, that is, dressings may tune the patient-specific physical, chemical and thermal conditions in the exudate as needed.

Ideal dressing characteristics in exudate management of diabetic foot ulceration

Paul Chadwick[1]

1 *The College of Podiatry, London, United Kingdom*

Aim: This presentation will look at the key issues relating to the choice of dressings when controlling moisture balance in the diabetic foot. It will use case studies to examine the effects of appropriate and inappropriate dressing regimens.

Key Points: Exudate plays a key role in wound healing; however, it can delay healing when there is too much or too little or it is in the wrong composition. Effective assessment and, crucially, effective management of exudate is therefore key to ensuring timely wound healing with less risk of complications. This is of increasing importance in the management of diabetic foot ulceration where failure to manage moisture balance increases the risk of limb-threatening infection.

Dressings are the mainstay of exudate management. Dressing selection should be individual to the patient and the location of the wound. The foot is notoriously difficult to dress with issues regarding adhesion, conformability and adaptation under weightbearing having an impact.

Conclusions: As discussed in the World Union of Wound Healing Societies (2019) position document on exudate management, many factors will affect dressing selection, including wound bed tissue type, exudate level, wound depth, infection/biofilm and odour. In practice, dressing/device availability, reimbursement issues, clinician familiarity and patient preference are also likely to play important roles.

Challenges of wounds with high exudation – polyacrylate polymers dressings put them in use!

Gulnaz Tariq[1]

1 *Sheikh Khalifa Medical City, Abu Dhabi, United Arab Emirates*

Aim: Exudate is a double-edged sword, as they are beneficial to wound healing, but they are also its obstacle as well if it is not managed or controlled properly. In chronic wounds, heightened and ongoing inflammation is a likely contributor to increased exudate production. This may be related to wound infection and/or the presence of biofilm (Schultz et al, 2011; Percival, 2017).

Too much exudate will destroy the wound's healthy tissue, macerate its edges thus further delaying and even preventing healing.

From another perspective, patient concerns may differ from the clinician's priorities for treatment but should be treated with respect and appropriate action should be taken. Patients and caregivers state that malodor is the most distressing and socially isolating wound-related symptom (Gethin et al, 2014). Affecting patient quality of life is also exudate leakage, and the inconvenience of frequent dressing change.

In this presentation, we will aim to explain the challenges of wound exudate and showcase two examples of treating a high-exuding pressure injury with a SAP dressing and two examples preventing MASD.

Conclusion: If we follow the wound bed paradigm we can acheive our goal with a multidisciplinary approach and treating the whole patient not just the 'hole in the patient'. The correct tools to treat the wound locally is crucial. In highly exuding wounds SAP dressings are valuable assets to use as primary or secondary dressing because of their effectiveness in managing wound exudate and facilitating treatment. Polyacrylate dressings allow a higher quality of life for patients because of their multiple benefits in terms of reducing frequency of dressing change, reducing odor of wounds, preventing strikethrough of exudate to patients clothes and healthy skin in prevention: polyacrylate dressings such as Zetuvit Plus show excellent results in preventing MASD when used between skin folds, which in itself is a step to prevent pressure injuries in high risk areas.

Clinical relevance: Expert opinion on the treatment of highly exuding wounds

Acknowledgements: This presentation was sponsored by PAUL HARTMANN

Additional References: World Union of Wound Healing Societies (WUWHS) Consensus Document. Wound exudate: effective assessment and management Wounds International, 2019

The importance of a multidisciplinary team approach in the exudate management of patients with hard-to-heal wounds and the use of Zetuvit Plus Silicone

Astrid Probst[1]

1 *Kreiskliniken Reutlingen GmbH, Nursing Department, Reutlingen, Germany*

Aim: The importance of a multidisciplinary team approach in the exudate management of patients with hard-to-heal wounds and the use of Zetuvit® Plus Silicone.

Methods: In a case series with 10 patients with hard-to-heal wounds (Atkin et al 2019), we looked at the performance of Zetuvit® Plus Silicone in combination with a multidisciplinary team approach in hospital and a wound care ambulance. We measured the success of the therapy with a hyperspectral imaging camera system, TIVITA® Tissue camera (Wild et al 2018), to look at the perfusion and the tissue water index. We also looked at the performance of the dressing in combination with compression therapy.

Results: In this case series, we found no damage in the tissue when applying a compression therapy and using Zetuvit® Plus Silicone as an wound dressing. We also found no damage in the surrounding skin or any allergic reaction. The inclusion of a physiotherapist in the treatment process improved the exudate management and the mobility of the patient.

Conclusion: The management of exudate (WUWHS 2019) includes more than just the correct choice of the dressing. It is important to approach wounds in a multidisciplinary team. Zetuvit® Plus Silicone is one option for a dressing to handle exudating wounds and protect the skin. It also can be applied under compression therapy without damaging the tissue.

Clinical relevance: This is relevant for the MDT who deal with patients with hard-to-heal wounds, exudating wounds and different kind of compression therapy.

Acknowledgements: PAUL HARTMANN provided free samples of Zetuvit® Plus Silicone for the case series.

References:

Atkin, L., Bucko, Z., Condo Montero, E. et al (2019) Implementing TIMERS: the race against hard-to-heal wounds. J Wound Care 28 (3 Suppl 3): S1 – S49

Wild,T., Becker, M., Winter, J. et al (2018) Hyperspectral imaging of tissue perfusion and oxygenation in wounds: assessing the impact of a micro capillary dressing. J Wound Care 27 (1): pp 38 – 51

World Union of Wound Healing Societies (WUWHS) Consensus document (2019): Wound exudate: effective assessment and management. Wounds International

The management of exudation in case of lymphedema

John Schäfer[1], Myriam Seifert[1]

1 Universitätsklinikum Hamburg Eppendorf, Hamburg, Germany

Aim: Lymphedema is not a rare disease. Worldwide about three percent of all people suffer from chronic lymphedema, the number of people with chronic lymphoedema worldwide is estimated to be at least 200 million. Lymphedema can be defined as the accumulation of interstitial fluid caused by disturbed lymphatic drainage. The reduction in lymph flow can result from either congenital or acquired abnormalities in lymph drainage. Although lymphedema usually affects one or more extremities, it can also manifest in organs. Whatever the pathogenesis, it is often a chronic inexorable condition that poses a long-lasting and psychological problem for the patient and a complex therapeutic challenge for the physician.

Method: Wound, quality of life, photodocumentation, VAS; Zetuvit-Plus-Silicone®.

Results: In our supply we use Zetuvit-Plus-Silicone®. In addition to its high ability to absorb wound exudate during compression therapy, it is particularly easy to apply in difficult localizations and has good adhesion.

The secure containment keeps germ-laden and aggressive exudate away from the wound and its surroundings, thus reducing the risk of maceration and the resulting erysipelas and fungal infection. Due to the silicon-coated wound contact layer, the wound dressing does not stick to the wound, which enables atraumatic wound treatment and protection of the wound edges.

Conclusion: The permanent lymphostasis triggers a fibrotic remodeling of the tissue. Therapy should therefore start early. There are several factors to consider when treating patients with lymphedema. In addition to a low-salt diet and weight loss, manual lymph drainage and the wearing of special compression stockings and bandages are essential. Due to the massive leakage of lymph from the tissues, it can lead to maceration of the skin and later to the development of inflammatory wounds due to erysipelas and fungal infections. For this reason, good wound care is necessary. The treatment should be based on products that guarantee a high level of exudate management.

The comfort for the patient is particularly important here.

Clinical relevance: For patients with chronical wounds that involves a lot of exudation in case of lymphedema.

Acknowledgements: The Institute for Health Services Research in Dermatology and Nursing (IVDP).

References:

www.lymphnetz.de

The reduction of edema using compression and superabsorbents are important components of exudate management

Carsten Hampel-Kalthoff[1]

1 ORGAMed Dortmund, Dortmund, Germany

A chronic wound means for the patients, in addition to the physical complaints, a reduction of their quality of life. From the patient's perspective, pain, mobility restrictions, and exposure to unpleasant odors and wound exudate are the most frequent and most serious wound- and therapy-induced limitations.

In particular, heavy amounts of exudate, lead to several restrictions like the limitations of clothing options and the loss of social life. Which increases mental stress and requires urgent interventions through appropriate nursing and medical measures. The cause of increasing exudation is either a reaction to a critical germ colonisation, a wound infection, but mostly the result of problems with venous and lymphatic drainage. This is caused by missing or faulty decongestive measures (compression) and the incorrect selection of a suitable wound covering that prevents the exudate to leak, even under compression.

The lecture by Carsten Hampel-Kalthoff shows that the use of superabsorbers, a compression therapy adapted to the vascular situation and the education of the patients to activate their muscle vein pumps can ensure successful exudate management. Therefore as a result, the quality of life of the patients can be significantly improved.

The use of superabsorbent wound dressing Zetuvit Plus in the management of deep burn wounds

Natalia Borisovna Malyutina[1], Andrey Anatolyevich Alekseev[1], Alexander Eduardovich Bobrovnikov[1]

1 *Russian Medical Academy of Continuing Professional Education of MoH, Wounds and Wound Infections, Moscow, Russian Federation*

Aim: To evaluate the effectiveness of superabsorbent wound dressing Zetuvit Plus® in the treatment of patients with full-thickness deep burns.

Methods: The results of treatment were analyzed in 50 clinical cases. The patients aged from 24 to 70 years (49,2±2,6 years on average) had total burn areas from 10% to 65% TBSA (Total Body Size Area), (30,5±2,8% on average). The areas of deep burns ranged from 5% to 20% TBSA (10,8±0,9% on average). All the patients underwent surgical necrectomy. In 7–13 days after necrectomy, skin grafting (perforation coefficient 1:4) with preliminary excision was conducted. Following necrectomy and skin grafting, atraumatic dressings Grassolind® were applied to the wounds. 25 patients had Zetuvit Plus® applied as an absorbent dressing and the other 25 had multilayered cotton gauze.

Results: After surgical necrectomy wounds, were cleansed and granulation tissue formed in 7 to 16 days. In the Zetuvit Plus® group it took 9,3±0,5 days on average to prepare the wound bed for autografting. In the comparison group, it took 10,1 ± 0,7 days on average. That said, dressing change frequency in the Zetuvit Plus® group was lower (2,8 changes against 3,8 changes in the comparison group). After skin grafting, epithelial tissue formed in 12,2±0,3 days in the Zetuvit Plus® group, and in 12,6±0,5 days in the comparison group (difference statistically non-significant). In some patients, wound infection and partial autolysis were observed. Therefore, a second autografting was required. The autolysis rate was 39% in the Zetuvit Plus® group and 17% in the comparison group. This may be explained by so-called 'greenhouse effect' caused by superabsorbent wound dressings.

Clinicians, as well as patients, reported that Zetuvit Plus® dressings were convenient to use.

Conclusion: The use of superabsorbent wound dressing Zetuvit Plus® in the management of large-area deep burn wounds allows to prepare the wound surface for surgical closure within an optimum time frame. The use of the superabsorbent wound dressing allows to reduce the time of wound bed preparation, reduce frequency of dressing change, and increase patient comfort. Application of superabsorbent wound dressing on transplanted mesh grafts is not advisable.

Clinical relevance: Zetuvit Plus® dressings can be used in the treatment of patients with deep burns in the process of preparing the wound for surgical closure after necrectomy.

Acknowledgements: We thank our colleagues from the Moscow F.I. Inozemtzev's Hospital and the Burn Center of A.V. Vishnevsky Institute of Surgery for their help in carrying out this research.

References:

1. *Barret S., Callghan R. et al. An observational study of asuperabsorbent wound dressing evaluated by clinicians and patients. J Wound Care,2018 Feb 2; 27(2):91-100*
2. *Browning P, White RJ, Rowell T (2016) Comparative evaluation of the functional properties of superabsorbent dressings and their effect on exudate management. JWound Care 25(8): 452–62*

Lymphorrhoea as a largely under-recognized problem in exudate management of chronic wounds

Judit Daróczy[1]

1 *Istenhegyi Private Clinic, Wound Care Department, Budapest, Hungary*

Objective: To evaluate the capacity of the superabsorbent dressing (ZetuvitPlus®) to manage excessive lymphorrhoea in patients suffering non-treated chronic lymphedema escorted by non-healing chronic wound. Periulceral skin maceration of lymphedema patients is a largely under-recognized problem and one of the causes of delayed wound healing.

Results: Twenty patients, aged 48-72 years, were included in this study, between December 2017 and September 2018. The superabsorbent dressing was used as a primary dressing. After only 2 days, dressing change frequency was reduced from once daily to twice weekly in 50% (n=10) of patients.

Conclusion: Lymphedema is chronic swelling that happens when the lymph is not moving properly as a result of damage to the lymph nodes or/and lymph vessels. In the severe cases lymphorrhoea begins, inflammatory wounds develop and the skin around the wound is macerated. Maceration causes patients' pain as well as prolonging healing time and deserves more focused research. The best treatment for lymphedema escorted by ulceration is the complete decongestive physiotherapy (CDPT): manual lymphatic drainage, compression with bandages, exercises, and adequate wound care. Superabsorbent dressings (ZetuvitPlus®) have been designed to treat highly exuding wounds and especially in chronic lymphedema. The superabsorbent dressing seems to reduce complications associated with exudate production, and damage of physiological microbiome, stimulate wound healing and increase patients' comfort; it may also save time and costs for care.

Keratinocytes under the spotlight: Epithelialization process is essential for wound healing

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Key Points: Wound healing, a process that aims at barrier restoration, integrates multiple cell types and cellular processes to achieve closure. Such organized process coordinates multiple cell compartments and processes in spatial and temporal manner by using complex signaling networks and micro-environmental factors. Keratinocytes, major component of epidermis, play an important role during all phases of wound healing by signaling and crosstalk to other cells, and by migrating and proliferating to close the wound, ultimately achieving barrier restoration and wound closure. Although this ability of skin to maintain barrier and heal wounds is evolutionary conserved and maintained throughout a lifetime of an organism, it fails due to various underlining issues. Chronic wounds, such as diabetic foot ulcers (DFUs) and venous leg ulcers (VLUs) represent a widespread unmet clinical challenge and major burden on healthcare systems worldwide. Epithelialization is also impaired in these patients. Details of biological functions of keratinocytes during healthy and chronic wound healing will be reviewed. Finally, different approaches to restore keratinocyte biological function and epithelialization capacity in chronic wounds will be discussed.

Conclusions: A comprehensive understanding of the epithelialization process will provide new tools for clinical approaches to facilitate epithelial wound closure.

Clinical assessment of a foam dressing containing growth factor-enhancing hydrated polyurethanes

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Aim: Clinical assessment of a novel dressing concept containing growth-factor enhancing hydrated polyurethanes in venous leg ulcer (VLU) patients.

Methods: Patients were treated for eight weeks with a foam dressing containing a hydrated polyurethane interface plus concomitant compression therapy. Wound area reduction (WAR), percentage of wounds achieving a relative WAR of ≥40% and ≥60%, wound pain ratings for the last 24 hours and at dressing changes, EQ-5D Quality-of-Life questionnaire data.

Results: 128 patients received treatment and data for 123 wound treatment courses were documented. Wound area size decreased from 13.3±9.8cm^2 to 10.5±12.2cm^2 at week 8 and median relative WAR was 48.8%. At week 8, a relative WAR ≥40% was reached by 54.5% of the wounds, 41.5% reached a relative WAR of ≥60% and complete healing was observed in 13.5% of wounds. Median wound pain ratings (last 24 hours before dressing change) declined significantly from 30 to 15.5 (100 visual analogue scale [VAS], p=0.0001) and pain at dressing changes from 30 to 12.5 (p≤0.0001). The EQ-5D VAS rating increased from 58.4±19.2mm to 63.1±19.1mm (p=0.0059).

Conclusion: This clinical assessment shows that the concept of boosting endogenous growth factors through hydrated polyurethanes has the potential to accelerate WAR in VLU patients while decreasing pain levels and improving quality-of-life parameters.

Clinical relevance: Comparison with historical data showed that this dressing concept showed significantly better healing outcomes compared to a historical control group and similar efficacy to a corresponding foam dressing containing a pharmaceutical ingredient.

Acknowledgements: The BOOST-CLOSURE study group includes the following investigators: Mikosiński J, Kotala M, Łódź, Poland; Stücker M, Bochum, Germany; Twardowska-Saucha K, Zabrze, Poland; Bonnekoh B, Magdeburg, Germany; Pańczak K, Tyniec Mały, Poland; Aleksiejew-Kleszczyński T, Kraków, Poland; Dissemond J, Essen, Germany; Eming SA, Cologne, Germany; Kaspar D, Schröder W, Smola H, Heidenheim, Germany; Rousseau A, Bewert J, Hamburg, Germany.

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An easy manner to manage second degree burn in children

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Aim: Second degree superficial burn are certainly the most common but the more painful burn encoutered by medical staff.

Despite the fact that the prognosis of such type of burn are excellent, the management could be difficult due to pain experienced by the patient. Normally second degree superficial burns complete healing within 2 weeks. There are a lot of habits and protocols which are used in burn centers, but they certainly don't change the healing time. The major problem medical staff have to deal with is to reduce the pain until the burn heal.

Methods: We evaluated the role that Hydrotac® can play in the management of second degree burns. To be enrolled patient must have second degree superficial burns and must be seen between D0 and D3. The dressing was applied and changed two times a week until complete healing.

Results: We focused our study on children and evaluated the dressing on 20 patients. The mean age was 6,8 years old and the location of the burns were: trunk or back (9 cases), abdomen (4 cases), face (2 cases), limb (5 cases). All the patient healed between D8 and D12. For children who where old enough to evaluate, all have the feeling of pain reduction just after Hydrotac was applied. The dressing change was evaluated as unpainful in all cases. Nurses appreciated the dressing because it reduced the need for change, make the management of such types of burn more easy and ensure a good evolution of the burn.

Conclusion: Finally Hydrotac appeared to be useful in the management of second degree superficial burn by reducing the pain and the number of dressing change.

Superficial cutaneous burn care: The impact of a new management protocol

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Superficial cutaneous burns are frequent in emergency rooms (ER). The main care objectives are to reduce the pain and provide good healing. According to the French recommendations, superficial second degree burns must be handled with a type B, C, D bandages, with a control at day 8. And according to two Cochrane meta-analysis in 2013, the use of silver sulfadiazine is associated with a significant increase of infections, of the duration of hospitalizations and with a worse healing. Silver sulfadiazine should be excluded and replaced by hydrogel bandages, which seem to improve the healing.

Methodology: We conducted a review of second degree burn records over three year (2016-2018), following the publication of a new management protocol in our ER. The elements collected were age, sex, cause, the affected site, cooling before dressing, pain level at day 0 and day 1, tetanus vaccinal status, type of dressing, reassessments.

Results: We recorded 185 patients, aged 1 – 87, 57% women. The main causes were boiling water and oil, no site predominated. Tetanus vaccination status was known in 31%. Only 45% were cooled before or in the ER. A hydrogel HYDROTAC transparent dressing (type B) was used in 72%, silver sulfadiazine in 11%, and trolamine emulsion in 9%.

In terms of follow-up, there was 55% of reassessment at day 1, 14% at day 8. And 8 patients were immediately referred to burn center, 8 others after reassessment.

Patients treated with hydrogel HYDROTAC transparent dressings had a pain decrease in pain between day 0 (medium level 5 [0 – 10]) and day 1 (medium level 2 [0 – 7]), while there was no decrease for those treated with silver sulfadiazine between day 0 (medium level 5 [2-7]) and day 1 (medium level 5 [5-5]).

Conclusion: The establishment of a management protocol haves enabled our ER to share and clarify the objectives of superficial cutaneous burns care. The hydrogel HYDROTAC transparent dressing seems effective to reach the goals of superficial cutaneous burn care.

My check-list - How I use the HydroTac system. Practical aspects from the surgeon's point of view

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Aim: We have a great deal of information regarding research on the molecular level of wound healing. On the one hand, this is important when it comes to the development and scientific testing of bandages. On the other hand, looking from the practical point of view, visible signs and the connection with the clinical picture is more relevant; sometimes there are only a couple of minutes available to assess the tool and make a clinical decision.

Methods: For every patient with a chronic wound, the protocol was as follows: Photographic documentation with klonk image measurement

1. Accurate definition of the wound surface
2. Definition of a 1 cm border surrounding the wound
3. Definition of hyperkeratosis
4. Securing wound surface - bacterial biofilm
5. Measuring quality of granulation tissue
6. Physical description of the area under bandage (inflammation, oedema, necrosis, biofilm, secretion).

This checklist was performed at the each dressing change for at least a 4-weel period.

Results: After introducing HydroTac bandages, we compared our results with the effects of conventional sponge bandages. For a quick and easy assessment, we have used the six questions above to measure the efficiency of the hydro bandages, and the difference was immediately unequivocal. We are presenting the parameter changes of ten patients - either sole and forefoot diabetic wounds and patients with leg ulcers.

Conclusion: During the everyday practice surgeons have to make a decision about the future treatment of the wound. By changing the "status idem" based on the orderly comparative data, wound healing efficiency will increase, and we can keep up with the progress of the intelligent bandages.

Our experience in wound care products – case series from Turkey

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Aim: This case series has been performed to demonstrate the effectiveness of Hartmann wound care products in exudate management.

Methods: In this presentation, we will present 4 cases with adequate wound healing between March-September 2018 in our hospital. Hartmann wound care products were used in all cases. All of the patients except case #4 had a diabetic foot infection and all of the patients under went local debridment on point of care at first closure. VAC has been used in case #3, in the first 3 weeks of treatment. H_2O_2 + NaHOCl solution has been used for wound irrigation in all patients. After irrigation, closure equipments were used two or three times a week.

Results: Patients are summarized in the table. Pictures of the first treatment day and last closure days are also shown.

Case Number	Age /Gender	Wagner Grade	Doppler USG	Tissue Culture	AB treatment	Closure equipment	Treatment Day
#1	45/F	3	N	-	CIP+CLN	Hydrotac Comfort	90d
#2	38/F	3	N	ESBL+ E.coli	PTZ+CIP+MET	-Hydrotac Comfort -Hydroclean plus	37d
#3	65/M	3	N	Mixt	IMP+VAN	-VAC -Hydroclean advance -Hyroclean cavity	50g
#4	45/M	-	Venous insuffciency	Mixt	IMP+CIP+MET	-Hydroclean plus -Sorbalgon	54g

ESBL: Extended spectume beta lactamase
CIP: Ciprofloxacine
CLN: Clindamycine
PTZ:Piperacilline-Tazobactame
VAN: Vancomycine
MET: Metronidasole
IMP: Imipeneme

#Case 1 *#Case 2* *#Case 3* *#Case 4*

Conclusion: Nowadays, many topical treatment and dressing materials are actively used in wound care. In our experience, Hartmann products work well in wound care. As is evident from the patient examples we present, it is sometimes necessary to use other wound care techniques besides these products. Ultimately we should know that, wound care must be personalized for each patient.

Clinical relevance: Hartmann wound care products work well alone or in combination with different methods.

Acknowledgements: My research assistants; Taylan Onder, S.Bilge Guclu, Anil Akca

Exudate management and NPWT

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Aim: Exudate is inflammatory extravascular liquid of specific weight with high concentrations of proteins, containing various types and amounts of cells. It is one of the morphologic demonstrations of an inflammation that is very important for the wound healing process. Amount of exudate and its characteristic represent a factor in decision-making and in choice of the treatment. In wound management, the amount of exudate needs to be regulated by means of a wound dressing to prevent skin maceration but, it is necessary to maintain enough moisture in the wound as it unequivocally speeds up the wound healing process. This treatment brings several benefits, but existing work fails to unequivocally prove any positive impact of this therapy.

Methods: Retrospective analysis of patients treated by NPWT, evaluation of length of NPWT therapy, amount of exudate in individual diagnoses and comparison of our results with studies.

Results: Within our group we assessed 388 patients treated by means of NPWT with the Ø age of 62.93 years. The Ø No. of dressing changes per one patient reached 3.96 and the Ø length of treatment was 17.2 days. Age of the patients had no impact on the length of the NPWT therapy, this factor influenced the length of their hospitalization. The highest volume of exudate occurred in 101 patients treated with open abdomen with Ø vol. of 3,026 ml, the Ø length of treatment was only 15.96 days while 20% patients with OA died. In case of patients with open fractures and injuries with loss of soft tissues with defects of upper and lower limbs, the Ø time of treatment reached 20.4 days. The amounts of exudate varied with the Ø vol. of 85 ml. Despite this, the healing of fractures following the NPWT treatment was affected in a negative way.

Conclusion: NPWT represents a great method in wound treatment used for exudate management. The treatment must be performed rationally for only necessary period to prevent undesirable loss of proteins and blood cells.

Clinical relevance: NPWT use but not abuse.

Exudate management with NPWT in mesh suppuration after abdominal wall reconstruction with mesh

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Aims: The exudate in non-healing wounds decreases or even prevents cell proliferation, interferes with growth factor availability, and generally contains elevated levels of inflammatory mediators and activated metalloproteinases. All these mechanism slow down the wound healing. The authors present their results with NPWT in cases of mesh suppuration.

Patients and methods: All presented patients underwent abdominal wall reconstruction with only mesh implantation and in all patients mesh suppuration had developed as complication of surgery. Wide exploration, necrosectomy and lavage of the wound was performed than NPWT (Vivano-Med) was started with continuous -120 mmHg suction. After the level of exudate was decreased the NPWT was changed for intermittent mode.

Results: Prevention of the implanted mesh was possible in more than 80% of the patients. Primary wound closure in 72%, secondary wound closure was possible in 25% of the patients. In one patient, plastic surgery was needed for closing of the wound.

Conclusions: The NPWT was successful for evacuating exudate from septic wounds. NPWT has a good effect of the mesh salvage in cases of mesh suppuration.

Complex wound care and exudate management using NPWT during abdominal compartment syndrome caused by acute pancreatitis

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Aim: To present the complexity of the treatment of abdominal compartment syndrome (ACS) caused by acute pancreatitis. This challenging condition needs a complex surgical and intensive care approach.

Methods: The authors report a case of a 47-year-old male patient who developed severe acute pancreatitis and subsequently ACS, showing rapidly increasing intra-abdominal pressure values, which needed surgical decompression. After the decompressive laparotomy the VivanoMed Abdominal kit was inserted in the abdomen, a negative pressure of 100 mmHg was set up. The Abdominal Kit was changed every 3-5 days.

Results: At the beginning of the treatment up to 4000 ml exudate per day was evacuated from the abdominal cavity, which started to decrease after a few days. After 4 weeks of the onset of the pancreatitis - during the open abdomen treatment - the pancreas became infected, and the necrosectomy was performed, together with a subtotal colectomy, which was necessary because of an extensive damage of the colon. The closure of the abdominal wall was possible by component separation, combined with NPWT. After 3 changes of the NPWT dressing closure of the skin was possible, and an incisional NPWT dressing was used for another 5 days. The wound healed without complication. The pancreatitis healed, no more operations were needed. Unfortunately the patient died suddenly because of a malignant cardiac arrhythmia, 2 days before the planned emission from the hospital.

Conclusion: When abdominal decompression surgery is needed during ACS, NPWT is a good tool in the hands of the surgeon, making complex wound and exudate management possible during the treatment.

Clinical relevance: Management of the open abdomen, as well as the closure of the abdominal wall after abdominal NPWT can be challenging. Deep knowledge of the different types of NPWT possibilities is recommended for surgeons who treat patients with acute pancreatitis.

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Management of refractory ascites using NPWT. A pilot study

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Aim: Postoperative ascites for cirrhotic patients is the most common complication after liver resection with reported rates ranging from 5% to 56%. Several studies have suggested that the ability to control ascites may be a prognostic factor on morbidity and mortality. The ascites flow through the scar of the abdominal wall presents a high risk of infection and makes the healing of the abdominal wound highly challenging. NPWT (negative pressure wound therapy) has been show to accelerate the wound healing in other surgical situations. We assess the impact of postoperative use of NPWT after hepatectomy in cirrhotic patients on ascites flow.

Methods: This is randomized, prospective, unicentric study, conducted from March 2018 to October 2018. In each group we compare the time needed to durably dry out the ascites flow using NPWT and conventional management.

Results: The post-operative course was marked by ascites without liver failure; the quantity at day 4 was 1100 ml. They were managed with diuretic agents and NPWT was used directly on the skin. The dressing was changed at least every 4 days, depending on the tolerance and the evolution of the skin healing. The NPWT allowed to stop the fluid ascites and yielded complete wound healing after 5 days on average. None of the 5 patients developed ascites infection. One month later a CT-scan was performed on all patients; none of them showed ascites.

Conclusion: NPWT allowed faster surgical wound healing. Medical management of ascites could be optimized and risk of ascites infection might be reduced.

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Prophylactic ciNPWT for high-risk laparotomy wounds. Preliminary results of a multi-centre randomised controlled trial

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Aim: Emergency laparotomy wounds represent a high risk condition for surgical site infection (SSI) due to the amount and quality of peritoneal and abdominal wall exudate production. Closed incisional negative pressure wound therapy (ciNPWT) is one of the potential tools to control excessive exudate production and prevent SSI.

The aim of our trial was to assess the effectiveness of ciNPWT in the prevention of SSI. In order to achieve a sufficient power of the study, we conducted a multicentric, ethically approved RCT spanning 12 abdominal surgery centres.

Methods: 300 cases of Class III-IV. Wound-type emergency laparotomies were randomized with 1:1 ratio into conventional, dry wound care and ciNPWT treatment for 5 postoperative days.

Primary endpoint of the trial was SSI requiring wound re-opening with removal of wound stitches or clips. Secondary endpoint was abdominal wall dehiscence requiring surgical re-intervention.

Results: 10 surgical centres of the 12 accredited departments have started to recruit suitable candidates for the trial. In frame of the presentation we are ready to present the interim analysis results of the first 100 cases.

Conclusion: We aim to demonstrate (prove or rule out) the clinical effectiveness of ciNPWT in septic laparotomy surgery. We are awaiting firm responses on critical morbidity and financial questions regarding the technique, which remained open in the literature, so far.

Clinical relevance: ciNPWT may step up into primary choice in septic laparotomy for SSI prevention if clinical superiority and cost effectiveness can be demonstrated in a high qualitymulticentric RCT.

Acknowledgements: This presentation represents the cooperation of 10 institutions: Krisztina Varga, András Fülöp, Gábor Ferreira, László Harsányi, László Ternyik, Zsolt Káposztás, Zsolt Susán, Zsolt Szentkereszty, Zsolt Simonka, György Lázár, Balázs Mohos, Zoltán Lóderer, László Venczel, László Sikorszki, Éva Lilla Kovács, Zsolt Kincses, Balázs Samu Pánczél, Vilmos Szendrényi.

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Management of pediatric extravasation injuries with NPWT

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Extravasations injuries are common in pediatric population most frequently in neonatal intensive care units. Accidental infusion leakage into the subcutaneous tissue may lead to skin necrosis and can cause long-term scarring with cosmetic and functional implications. Extravasation of calcium gluconate is often less frequent and most articles reported isolated clinical cases. Injuries are often severe and negative pressure wound therapy is useful for the management.

We report two cases, a neonate and a 15-year-old adolescent with severe injuries to the back of hand and forearm. Erythema and swelling were very important for the two patients and skin necrosis appeared and required debridement three weeks after extravasation. The neonate presented white papules with subcutaneous calcifications revealed by radiographs and calcinosis cutis was diagnosed. Subcutaneous tissue still presented swelling and poor vascularization which was not efficient for good healing. Functional positions with orthosis were difficult according to swelling. We used NPWT for reducing swelling and optimizing tissue before coverage procedure. Skin graft was performed at day 30 and 35, and healing was achieved.

Subcutaneous calcium solutions lead to signs of inflammation and often severe swelling several days after extravasation. Significant risk of skin necrosis is observed and depends of concentration, volume, duration of infiltration of agent and increased in neonate population. There's no consensus on management but recently several authors in the literature advocated early treatment with aspiration and washout techniques to dilute and remove the infused agent. If there is evidence of necrosis, debridement and coverage with skin graft or flap must be performed but can be impaired by the importance of swelling and local vascularization. NPWT can improve local conditions for good healing. Progressive clearing of tissue calcification occurred with no evidence at 6 months. Long-term scars remained with cosmetic and functional implications.

In conclusion, extravasation injuries are iatrogenic accidents. Prevention and early treatment are the best management. Calcic solutions can lead to severe tissue damage with skin necrosis and swelling which required surgery. NPWT can optimize this treatment.

Combined NPWT and Omental Flap for prosthetic femoropopliteal bypass Graft salvage

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Aim: To highlight the use of negative pressure wound therapy (NPWT) for the treatment of surgical site infection (SSI) after emergency vascular reconstruction with a synthetic prosthesis. The risk to life and limb of these infections and subsequent sepsis poses management challenges in the treatment of infection, sepsis source control, and management of the exudate. The case also highlights approach problems in applying NPWT in the groin region and other transition zones.

Methods: We reviewed the case of a young adult male admitted to our department with an expanding right groin hematoma, emergent vascular reconstruction, and SSI and sepsis.

Results: The patient was admitted for a large hematoma of the right medial thigh with localized pain. Twelve hours after admission the patient became hypotensive, tachycardic and a vascular fistula developed over the area of the hematoma. Immediate surgery was performed and found a ruptured superficial femoral artery aneurism for which hemostasis and a proximal femoropopliteal bypass with a no. 8 PTFE were performed. On postoperative day 9 the patient developed sepsis from an SSI. Source control was achieved with large skin and muscle debridement followed by covering the vascular prosthesis and the operative site with an omental pedicle obtained by laparotomy. NPWT was initiated over the omentum and the septic phenomena resolved in 48 hours. Granulation tissue started to develop over muscle tissue but was slow to form over the omental pedicle. Multiple skin grafts were necessary. Three years into follow-up the patient exhibits normal function of the right lower limb with slight edema.

Conclusion: The management of infected vascular prostheses remains challengeing. Management often leads to excision of the grafts and limb loss. The use of an omental pedicle combined with exudate management with NPWT led to excellent source control and to a resolution of sepsis.

Clinical relevance: The combined use of omental pedicles and NPWT can lead to salvage of infected synthetic prostheses after SSI of bypass graft procedures.

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Enterocutaneous fistula: How to efficiently control the enteric effluent using NPWT. Recommendations, trick and tips and own experience

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Aim: Enterocutaneous fistula (ECF) is a challenging complication after visceral surgery associated with high morbidity and mortality rates. Control of sepsis, nutritional support, evaluation of ECF anatomy and delay of definitive surgery are the crucial aspects in holistic management of patient care. Moreover, chemical skin irritation by enteric effluent, inflammation of the surrounding tissue, impaired wound healing result in extremely challenging management in this group of patient. Negative pressure wound therapy (NPWT) is recognized as a method of choice in ECF management. The strategy facilitates active enteric drainage, maintains moist wound environment that enhance wound bed proliferation and improves nursing care.

In this study we describe a technical aspects of ECF patient management as well as present case series report showing varying applications of NPWT in clinical practice.

Methods: Retrospectively, we analyzed 32 patients with ECF diagnosed on clinical examination, confirmed by imaging studies and classified with regard to anatomic location, output volume and complexity. Patients were evaluated with ECF spontaneous close rate, management practice and outcome.

Results: A wide spectrum of NPWT techniques were used included: fistula VAC, tube VAC, Pepe's technique, silo VAC, fistula intubation and others. High-output fistula and presence of protruded intestinal mucosa are the most important clinical factor when considering spontaneous ECF closure rate. Otherwise, diversion of fistula effluent is crucial. Utility of NPWT allows for simultaneous wound bed healing and treatment of dominant ECF as a stoma-like management.

Conclusions: NPWT is a safe and efficient method in ECF management. The strategy and NPWT technique should be adjusted upon the specific ECF characteristics. A multidisciplinary approach is highly needed to achieve the goals of ECF management.

Application of NPWT in complex wounds in the Vascular Surgery Service of Centro Hospitalar Lisboa Norte (CHULN) - Portugal. Case report of a patient with traumatic injuries in both lower limbs

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Aim: Our objective is to describe the experience of the Vascular Surgery Service of CHULN as a pioneer of the application of NPWT in complex wounds in this particular case. The initial approach to this patient lesions was the responsibility of Plastic Surgery. However, due to the severity of the personal history and the evolution of the cicatrization of these lesions, Vascular Surgery intervened. The surgical treatment of this patient was multidisciplinary, having undergone a bilateral iliac revascularization and skin grafting. NPWT proved to be the best advanced therapy in the management of wound bed moisture level, reduction of perilesional edema, infection / biofilm management and optimization of tissue in the wound bed, promoting epithelialization and consequently healing.

Methods: We performed a case report of a young woman with Juvenile lupus (25 years of evolution) and anti-phospholipid syndrome. She had a traffic accident with traumatic injuries in both lower limbs.

Results: The treatment lasted 2 months, at the end of which, the wound had 100% epithelial tissue. The results obtained demonstrate reduction of healing time, risk of wound infection rates and pain associated with wounds, and an increase of autonomy, mobility and quality of life.

Conclusion: The establishment of good practices in the prevention and treatment of wounds demonstrate highly positive results, namely reduction of the number of errors, improvement of results, as well as greater predictability of associated costs.

Clinical relevance: NPWT is a advanced therapy used in the treatment of complex wounds.

Used in specialized centers and with experience, NPWT can be a simple, safe and effective method for the treatment of complex wounds to reduce healing time. Long periods of hospitalization can be avoided.

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Prophylactic NPWT in vulvar carcinoma

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Introduction: Invasive vulvar carcinoma is a rare disease. This is the fourth gynecological cancer and affects 3 to 5% of women. Its incidence is estimated at 2 / 100,000 women. It occurs most frequently in women over 60 years often with comorbidities (for example, diabetes, undernutrition). The treatment of vulvar carcinoma is essentially surgical and involves a radical vulvectomy that may be associated with inguinal lymph node exploration. The surgery tries to be less mutilating but it is still a heavy surgery with a complication rate of 26 to 85%. Patients with this type of pathology have a poor quality of the integuments, a precarious vascularization, associated with the operative sacrifice of the subcutaneous tissue. The proximity of the septic orifices means that infection and deep disunion are frequent. In order to avoid these complications we use negative pressure wound therapy (NPWT) as a preventive measure. The device is placed postoperatively immediately to reduce secretions, areas of friction and thus accelerate healing to avoid and reduce the size of disunity.

Case description: We present the results of 3 patients presenting a vulvectomy in the context of a pre-cancerous lesion (VIN3) or a vulvar carcinoma treated by superficial partial or total radical vulvectomy with NPWT in immediate postoperative period for 10 days. NPWT allowed immediate healing or minimal superficial disunity in all 3 cases. The final healing was achieved within a few weeks for all patients and avoided the heavy and painful local care.

Discussion/Conclusion: In the absence of preventive NPWT, such dilapidated surgery is very often the cause of infection and disunity to the deep plane. Prophylactic NPWT is an essential tool for the management of vulvar lesions. This therapy allows a much faster healing by avoiding or reducing the size of the disunions that remain superficial.

NPWT-induced effective wound healing in the treatment of vascular graft infections

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Aim: Vascular graft infections (VGI) bring high morbidity and mortality and can be challenging primarily due to life-threatening proffuse bleeding. For PAD patients who have undergone vascular graft implantation (VGI), the lack of circulation, low nutritional status and in some cases thick adipose tissues can often lead to surgery site infections (SSI). In cases of SSI-based exposed grafts neither wound management is feasible nor primarly wound closure. Negative pressure wound therapy (NPWT) could be a proper solution to induce effective wound healing by reducing edema surrounding the wound, stimulating circulation, increasing rate of granulation tissue formation, decreasing the size of wound, and keeping the wound closed until secondary wound closure.

Methods: In our clinical practice between May to December in 2018, 8 patients were treated with NPWT due to VGI-related SSI. Graft patency and perigraft infiltration was diagnosed by MINO wireless ultrasound system. Etiopathology involved postpunction haematoma (1 case), femoral reconstruction with direct suture lines (1 case), femoroprofundal synthetic graft infection (1 case), femoropoliteal synthetic graft infection (2 cases), and femoro-crural GSV reconstruction (3 cases). After initial surgical wound debridement, VAC was applied using a two-layer combination with PVA and polyurethane sponges. Continuous negative pressure was set on between 80-90 mmHg. All patients recieved systemic antibiotic therapy from 2 to 6 weeks postoperatively. Therapy was continued until the vascular graft was covered with granulation tissue and either wound size had reduced to secondary closure or could be covered by skin grafts.

Results: After NPWT removal in 5 cases, secondary wound closure became possible, in 2 cases open wound management was continued to 4 weeks and 1 patient required transpositional sking graft. All wounds healed. Application of NPWT was 9±6 days on average. During the initial observation period (3-6 months), no SSI or VGI reinfection occured.

Conclusion: As long as prosthetic grafts are used to treat PAD patients, and biological grafts are not the one and only solution for treatment, higher morbidity of VGI has to be expected, although NPWT-induced effective wound healing can be a strong weapon to avoid higher risk of adverse outcome.

Poster presentations overview

Application of the TIME Principles: Combined sequential treatment with hydroactive wound dressing and NPWT, *Luisa Albuquerque*

From exudate control to epithelization: application of negative pressure wound therapy (NPWT) in complex wounds after larval debridement therapy (LDT) in the Vascular Surgery Service of Centro Hospitalar Lisboa Norte (CHULN) – Portugal, *Ana Almeida*

Wound bed preparation with HydroClean® Plus supported the second degree deep electrical burn, *Mahmoud Bataineh*

Complex treatment of patient with peripheral arterial disease and diabetic foot, *Emil Belinski*

Outcomes and complications using NPWT for infected bypass grafts in the lower limb, *Laszlo Benko*

The management of the patient with diabetic gangrene of the dorsal part of the foot, *Cosmin Buzea*

Fournier necrotizing fasciitis. Necessity of multidirectional wound therapy. Surgery + HBOT + NPWT, *Bartosz Cybułka*

Debridement and epithelialisation potential of Hydro responsive wound dressings in burn wound management, *Jacky Edwards*

Limb salvage by HydroClean application, *Michel Feghaly*

A new approach to wound debridement in order to facilitate wound epithelialisation in the community healthcare setting, *Heather Hodgson*

Rationale behind pre-emptive use of NPWT, the next step of use of NPWT in general surgery, *Martin Hutan*

Limb salvage with a hydrotherapy range of dressings in a patient with a deep neuro-ischemic calcaneal ulcer, *Alpa Lakhani*

Better safe than sorry. Application of incisional NPWT versus NPWT in patients with calculated risk on healing process, in Cardiothoracic Surgery of Centro Hospitalar Lisboa Norte (CHULN), Lisbon, Portugal, *Ester Malcato*

The use of negative pressure wound therapy after fasciotomy in lower leg compartment syndrome, *Yan Mykyta*

Diabetic foot treatment with local negative pressure - case report, *José Neves*

Successful treatment of an infected lymphovenous ulcer with hydroclean plus, *Emre Özker*

NPWT in the treatment of patients with active venous ulcers due to CVD, *Dimitar Petkov*

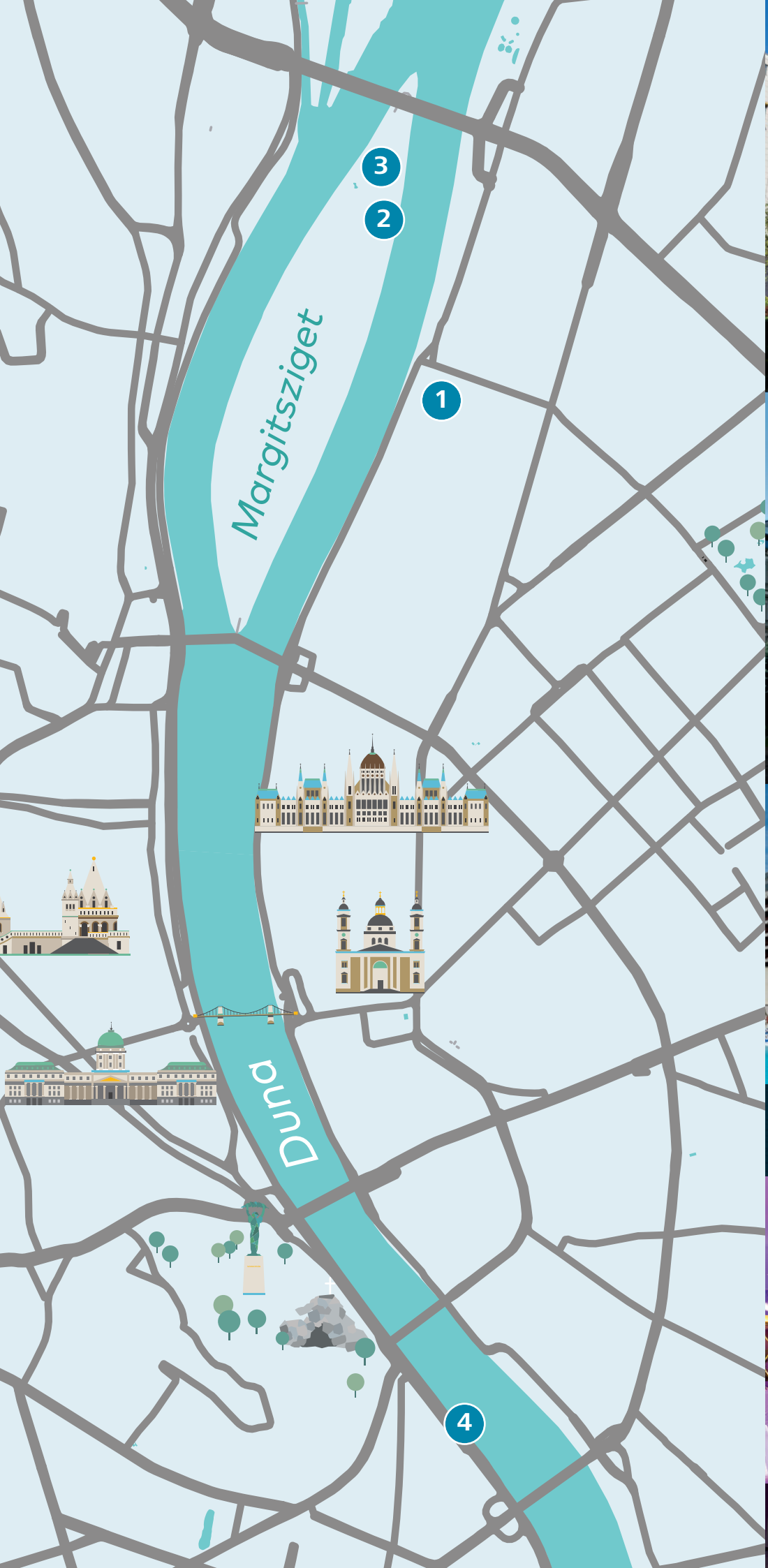
Postoperative management of complicated lymphangiomas in a child with negative pressure wound therapy, *Marie-Christine Plancq*

The management of exudation and an autolytic dressing in case of Pyoderma Gangraenosum, *John Schäfer*

Dissecting haematoma in elderly: Performance of an irrigo-absorbant dressing (HYDROCLEAN) after surgical debridement in an emergency department, *Jean Sende*

Treatment of diabetic foot ulcer complications with the combination of compartment anatomy-based longitudinal incision and negative pressure wound therapy, *Gergely Vadasz*

Palliative Use of Topical Pressure Wound Therapy on Malignant Wound, *Susana Valerdiz*



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