PALLIATIVE WOUND CARE WITH A GLYCERINE HYDROGEL*

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Patients with malignant lesions are exposed to several complex problems. The lesions are usual stinking, ulcerating dermal defects, infected by fungi and bacteria. Just this foul smell causes in most cases a mental burden. It is a difficult task for nurses or relatives in caring these patients. This article will discuss in detail some aspects of palliative wound care. The purposes of the treatment with a glycerine hydrogel are diminishing the excessive production of wound exudate, suppressing the sharp odour with a less frequent change of wound dressings.

Oncological wounds
Oncological wounds can be defined as skin lesions caused by infiltration of carcinoma in the epithelium, resulting in ulcerating nodular tumours notorious for infection, haemorrhages and a stinking exudate. The diffusion of oxygen in the surrounding tissue is reduced as consequence of the decreased bloodflow caused by thrombosis and changes in the vascularisation easily resulting in gangrene and overgrowth of aerobic and anaerobic bacteria. Due to a number of complex factors these patients often present the defect in a late phase. The ulcerating tumours are then frequently infected with fungi and can be complicated by developing sinus and fistula. These kind of infections can occur in decubitus lesions and due to a poor health condition of the patient will not recover. These non-healing wounds require a palliative
treatment offering as much comfort as possible to the patient and entourage and so improving the quality of life. Wound care should focus on cleaning and keeping clean the lesions causing a clear improvement without unacceptable side effects. Suppressing the micro organisms in the wound will generally decrease the inflammatory activity and reduce the exudate to manageable quantities.

**Local chemotherapeutic agents**
The known local chemotherapeutic agents, such as silver sulphadiazine (Flammazine®), nitrofural (Fluracine®) and pvp-iodine (Betadine®) usually have some effect, although mostly temporarily. Pvp-iodine is on the intact skin the most effective against fungi, however in the presence of (an excess of) wound exudate, pvp-iodine is quickly bound and inhibited. Against the use of these therapeutics for a short period there is little or no objection, but if used in a long term treatment as in chronic ulcers the side effects will prevail. Beside dressings usually need to be changed more than once daily, which is simply experienced as a burden. A less frequent change of wound dressings is a keypoint in the choice of an optimal therapeutic regime.

**Glycerine**
The antibacterial, antiviral and antifungal properties of glycerine are still not generally known, although among other things these properties are used in the preservation of human donor skin for many years. The skin is harvested within twelve hours after the death of the donor and contains bacteria, viruses and fungi. Research on skin of thousands of donors by the Euro Skin Bank has shown that all cultures became negative. The antibacterial and antiviral activities of glycerine are confirmed in laboratory experiments. Glycerine is not a disinfectant. The requirement to inactivate or eliminate bacteria, viruses or fungi in short time cannot be met. Depending on concentration and temperature, the inhibition of glycerine will take several hours or even weeks. For disinfection of wounds the time criterion is less important. After the initial repression of a florid fungi infection, the prevention of the nearly inevitable re-infections is of the utmost importance. Metronizadole can be used for initial phase. Alginates (Kaltostat®, ConvaTec, Woerden) are frequently used to control excessive exudate. It is possible to obtain in such a way an acceptable situation. But then a long term use of chemotherapeutics is unsuitable to maintain that situation. Consequently, there is a great need for materials and methods, which can preserve a once achieved status quo in the wound bed.

**Glycerine hydrogel**
Elasto-Gel™ (Medipof, Bleiswijk, The Netherlands) is a poly-acrylamid matrix hydrogel in which water has been replaced by glycerine, during the polymerisation process. This
glycerine is released only in small amounts as the matrix absorbs water. But that amount is sufficient to establish a concentration of glycerine on the intact skin to avoid growth of bacteria and fungi. The interaction with the skin lipids improves the barrier function of the epidermis and so increasing the water content of the dermis. As a consequence the skin is more supple and the peripheral circulation improves. Necrotic scraps in the wound are dried by glycerine. The dissication of the outside of the necrosis gives a barrier for evaporation inducing a higher percentage of moisture in the wound resulting in an acceleration of the necrolysis\textsuperscript{12}.

Glycerine is important in the synthesis of fats, cholesterol and hormones, but it is only found freely in the body in small amounts. In the wound bed an 'excess' of glycerine will be removed by macrophages. Histology has shown that macrophages in glycerine treated wounds contain a fatty, foamy substance, that is often typical for inactivated macrophages. As a consequence the inflammation reaction might be mitigated and the wound settles down.

The anti-microbial activity of glycerine is slow but effective, in the end all bacteria and fungi will be eliminated and/or inactivated.

In an experimental study a glycerine based gel was compared with a conventional waterbased hydrogel. In the glycerine treated wounds histology did not show any bacteria, the conventional treated ones were clearly infected. A skin once healed, can be treated undiminished with glycerine hydrogel because maceration of the skin is prevented. There are only a few wound dressing materials that are benevolent for the wound as well as the skin, permitting a wound healing without maceration of the surrounding (healed) skin\textsuperscript{13}. Frequent wound inspection without change is possible due to the non-sticking properties of Elasto-Gel\textsuperscript{16}. Only after the material clearly starts to discolour or to crumble, changing is indicated.

**Mamma carcinoma**

Skin ulcerations with fungi infections as a result of relapsing mamma carcinoma are often presented, but the incidence is unknown and can only be estimated. During a certain time patients try to control the stench and excessive exudate with absorbing dressings. Generally the patients become isolated and they cannot share their misery with family, friends and professionals. Besides they associate a florid fungi infection with an exacerbating, underlying malignant process, culminating in an intenable situation which compels to an adequate intervention. Until recently was the choice of an alternative for a regime of frequent dressing changes and the use of excessive incontinence materials not easy. Besides, frequent dressing changes at home are almost impossible, yet they are necessary to counteract bacterial infection and tissue deterioration. In this a change appears to develop now with the glycerine ‘therapy’. In the near future bacterial and fungal infections can be eliminated by the daily changes
with glycerine hydrogel dressings. The inflammation reactivity in the woundbed decreases as a consequence of the fading away of the infection. This process is possibly supported by the inactivation of the macrophages by fatty degeneration. And as a cascade the wound exudate considerably decreases aided by a diminished vascular leakage. Dessication of the upper side of the necrotic remnants promotes a humid environment in the woundbed and will favour a rapid necrolysis. Ultimately, a clean non-inflamed woundbed without necrotic tissue is attained, surrounded by a healthy skin. Whether further recovery will be possible, is determined by a multitude of factors, which are beyond the scope of this paper. In any case, there is now a wound, that can be treated by the patient at home once a day without the risk of re-infection. Glycerine dressings do not contain active anti-microbial chemotherapeutics, so the risk of side effects is reduced during prolonged application. Until now forty patients (Dept. of Radiotherapy, University of Amsterdam) are treated in this manner. The design for this two or three year lasting comparative randomised multicentre study of about two hundred patients in a number of five radiotherapeutic centres is now developed. Preliminary results confirm the positive effects of the glycerine dressings.

Decubitus
A patient can be confronted with a non-healing decubitus after a cascade of treatments for a number of different diseases. At the beginning, the whole strategy is aimed at preventing aggravation and to achieve healing. But finally, it can become evident that healing is not possible without surgery, and an operation is contra-indicated by various reasons concerning the health status of the patient. The palliative treatment of the ulcer shall be aimed at preventing infection with a minimal number of dressing changes for the benefit of the patient, relatives as well the district nurse. The care shall not only concern the sore, but also the surrounding skin that is prone to maceration. It is necessary to optimize the condition of the skin, to oppose maceration and to prevent infection, while the number of dressing changes shall be minimized\textsuperscript{13}. These terms were until recently almost irreconcilable. Admission to a nursing home is usually inevitable, due to the difficult or even impossible treatment for the district nurse at home. However, the use of glycerine hydrogel offers relief and the above mentioned terms can be met. Our first experiences with the home treatment of extensive decubitus ulcers using glycerine hydrogel show that it is possible to avoid admission in a nursing home and to realise an acceptable regime of dressing changes. It was also remarkable that the sores became almost odourless. The dressings are non adherent, making the changes nearly painless. Sometimes a light burning sensation was observed for a short while, probably caused by the hyperosmolarity of the glycerine. Even though the probability of healing decubitus ulcers is remote, maintaining a status quo without the risk of re-infection alters an insupportable situation in a more workable situation. This
considerably contributes to the motivation to a lasting optimal caring and thus improving the quality of life of the patient. Clinical research in the effectiveness of medicines in wound healing for decubitus necessary for a registration file appears to be unworkable, even more so for incurable ulcers. Experimental animal models can serve this purpose. At this moment there are no animal wound models for studying incurable ulcers.

Conclusion
A glycerine based hydrogel enables us not only to prevent skin lesions by radiation or becoming bedsores, but even more important it controls the wound infections in ulcerating tumours and decubitus ulcers. If only a palliative treatment is possible, a long term status quo can be achieved with a considerably increased treatment comfort for the patient and its environment. A reduction in the frequency of dressing changes without an increased risk for infection is unique for the treatment with a glycerine hydrogel. In consequence, the quality of life is improved for patients in the last stage of their lives, and also expensive nursing home beds are relieved.

Literature
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* Translated in English from an article originally published in Dutch in:
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