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– Infected Wounds –

**Has Cutisorb® Sorbact®
proved its practical value
as an antibacterial dressing?**

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Has *Cutisorb*[®] *Sorbact*[®] proved its practical value as an antibacterial dressing?

A total of 418 patients with contaminated, colonized and infected wounds were treated with the *Cutisorb*[®] *Sorbact*[®] dressing and documented over a period of 22 months. One of the aims of the study was to determine whether a dressing with purely physical effects can reduce the microbial count, especially in colonized and infected wounds, without adversely affecting the wound healing process and can be removed atraumatically and painlessly.

Introduction

As users of medical wound management products we are constantly searching for highly effective products which do not compromise and preferably even promote wound healing. Particularly at the beginning of wound therapy we find contaminated, colonized or infected conditions requiring special attention. The use of topical ointments and creams containing antibiotics belongs to the past and alcohol-based skin disinfectants have, for a variety of reasons, become obsolete in wound management. Hydrogen peroxide (H₂O₂) and similar agents proved unable to provide the required antiseptic therapy. Great interest therefore attached to testing a wound dressing without a chemically active agent which apparently exerts antibacterial effects, does not adhere to the wound when sufficient wound exudate is present, and can be removed without traumatizing the tissue.

This postmarketing surveillance (PMS) project was not designed as a comparative clinical study, but to evaluate the use of the novel wound dressing *Cutisorb*[®] *Sorbact*[®] on a wide variety of different wounds and to assess the product for its acceptance, compatibility and tolerability in the management of contaminated, colonized and infected wounds.

Our experience with *Cutisorb*[®] *Sorbact*[®] from June 2003 to March 2005

As already mentioned above, altogether 418 patients were treated with *Cutisorb*[®] *Sorbact*[®] over a 22 month period.

- Contaminated, colonized, infected traumatic wounds	112 patients
- Abscesses, furuncles, phlegmons	85 patients
- Colonized and infected postoperative wounds	72 patients
- Colonized and infected decubitus ulcers	72 patients
- Colonized and infected leg ulcers	55 patients
- Infected diabetic gangrene – preoperative	22 patients

Material and method

The wounds were between a few hours to 48 months old and the period of use of *Cutisorb*[®] *Sorbact*[®] ranged from 2 to 53 days. Most of the parameters investigated concerned the wound cleansing phase, i.e. the time at which infection, colonization and contamination are most likely and may impede wound healing. *Cutisorb*[®] *Sorbact*[®] was the sole subject of the assessment. Subjective parameters such as pain during dressing change, in-use comfort and patient and nursing staff satisfaction were elicited at every dressing change.

We performed bacteriological analyses on wound swab specimens from 38 patients with chronic (venous leg ulcer, decubitus ulcer) and secondary healing wounds (postoperatively after open forefoot amputation, fistula excisions and disorders of wound healing resulting from infected hematomas). We observed a quantitative decrease in bacterial strains such as *Staphylococcus aureus*, MRSA, *Pseudomonas*, streptococci, *Escherichia coli* etc. In some cases, removed dressing material was found to contain bacteriological organisms that were no longer present in the direct deep wound swabs. The wound swab specimen for microbial monitoring was taken not superficially but in the deep region of the wound in the form of a brush biopsy. *Cutisorb*[®] *Sorbact*[®] therefore resulted in microbial elimination.

After 2 to 8 days, the visual impression given by all the wounds already showed a marked decrease in infection and signs of infection, allowing the *Sorbact* dressings applied after wound care in the traumatological department, in some cases preventively, to be replaced by first-aid wound dressings. In the first few days of treatment with *Cutisorb*[®] *Sorbact*[®], we observed a thin fibrin layer on some of the wounds which was replaced after 2 to 3 days by a fine layer of well-perfused granulation tissue.

Cutisorb[®] *Sorbact*[®] in combination with semioclusive dressings / films

In the first few weeks of the study we completed the dressing with an absorbent compress and surgical tape and refrained from covering it with semioclusive

films. This proved to be the correct approach especially for infected wounds (e.g. after opening abscesses), since pus and bacterially contaminated wound exudate were discharged and could be taken up by an absorbent compress. The dressing change intervals were between 12 and 24 hours. Between wound treatments, the wounds were irrigated with an antiseptic and Ringer's solution and necrotic tissue was removed. After usually 48 to 72 hours we observed a significant decrease in infection, allowing us to start covering the *Cutisorb® Sorbact®* swabs or ribbon gauzes with a semiocclusive film (e.g. *Fixomull® transparent*). This was done to maintain a moist environment which promotes healing especially on low exuding wounds. With this treatment variant, dressing change for colonized wounds was also performed at the latest every 24 hours.

After an average 10 to 12 days it was possible to switch to wound treatment with hydroactive dressings such as *Allevyn® Thin* or *Allevyn® Adhesive*. Only for patients with forefoot amputation due to diabetic gangrene or arterial occlusive disease did we use *Cutisorb® Sorbact®* in combination with a hydrogel, completing the dressing with absorbent compresses, often up to the end of treatment. The difficult-to-apply hydrocolloid / hydroactive dressings, combined with gradual mobilization of the patient, resulted in considerable exudate production associated with maceration of the skin in the periwound area which could be avoided by using Sorbact dressings. The volume of wound exudate often made it necessary to change the hydrocolloid / hydroactive dressing after only 24 to 36 hours although the wound conditions would have allowed longer dressing change intervals.

The use of a skin protector (e.g. *Cavilon®*) acquires particular importance in this situation. Sorbact therapy was not observed to prolong the total duration of healing compared to treatment with hydroactive dressings. Comparative studies will be necessary to confirm this conclusion.

Cutisorb® Sorbact® should not be used for:

- wounds being treated with substances containing grease or oil

Cutisorb® Sorbact® should be used only to a limited extent on:

- all dry wounds such as abrasions, unless coverage with a semiocclusive film is possible
- all chronic wounds with little or hardly any exudate unless coverage with a semiocclusive film is possible

Wound situations after treatment with Cutisorb® Sorbact®:



Figures 1, 2, 3:
Suppurative mastitis. Figure 1 shows a detail during opening of the abscess under topical anesthesia with *EMLA®* cream. Mastectomy was planned but could not be performed immediately because of unfavourable blood values (prothrombin time 10 %, blood glucose 285 mg%, high urea values etc.). Figure 2 shows the status after completion of débridement and Figure 3 the insertion of *Cutisorb® Sorbact®* ribbon gauze.



Figures 4, 5, 6:
Necrosis and infection postoperatively following vascular surgery. The necrotic material was surgically removed and the wound was treated with *Cutisorb® Sorbact®* swabs and *Cutisorb® Sorbact®* absorbent pads. Figure 3 shows the wound status after 4 days of treatment.



Figures 7, 8:
Status after opening a small axillary abscess. The wound cavity was draped with *Cutisorb® Sorbact®* ribbon gauze and closed with a semiocclusive film. The dressing was changed after 24 hours. This dressing technique allows patients to perform personal hygiene activities (e.g. showering) without restriction.

Case example: Treatment of a 9 month old infected sacral decubitus ulcer

Diagnoses:

- Status post stroke with right-sided hemiparesis
- Fecal and urinary incontinence
- Infected sacral decubitus ulcer
- Senile dementia

Medical history:

The patient is paralyzed on one side following a stroke since when she has been bedridden. She is being cared for in her domestic environment by her relatives and a nursing service. Her daughter reported that a sacral decubitus ulcer was present for 9 months prior to hospitalization. Caring for the patient at home is difficult since she refused pressure-relieving positioning and/or repeatedly returns to dorsal position spontaneously.

Clinical examination revealed a soft tissue defect measuring about 5 cm in diameter, which was shown by palpatory examination to extend as far as the bone. The wound cavity was partly clean and partly contained necrotic material. The wound margin was reddened. Some of the necrotic material was removed by sharp debridement and an alginate and *Iruxol*[®] ointment was introduced. Wound margin protection was provided with *Cavilon*[®] spray. The patient was discharged home with instructions to continue the treatment and re-attend the clinic in 8 days.

The patient presented again at the agreed date. The wound situation had now markedly deteriorated: the proposed therapy had not been consistently performed. Further necrotic material with a putrescent odour was present in the wound bed. It was therefore decided to admit the patient for surgical management of the decubitus ulcer.

Wound treatment:

After introducing *EMLA*[®] cream and allowing it to act for 60 minutes, the decubitus was debrided as far as possible, a procedure which extensively revealed sacral bone. Loose bony material was removed with the necrotic debris. Diffuse bleeding from the wound bed was stopped with a hemostatic agent (*Tabotamp*[®]). Generous antiseptic irrigation was performed with *Octenisept*[®] and a *Cutisorb*[®] *Sorbact*[®] ribbon gauze was inserted for 24 hours.

New necroses repeatedly developed over the next three days and could no longer be debrided under local anesthesia. Necrosectomy and extensive debridement were therefore performed under intubation anesthesia. Necrotic muscle as well as elements of fascia and fatty tissue were recovered from the wound bed. In presacral localization, the fascia was almost completely consumed on an area about the size of a child's palm and the bone was eroded. Antibacterial *Sorbact* therapy was continued up to the 12th day of hospitalization. The decubitus ulcer was now free of necrosis and infection and granulation commenced. Wound healing was supported with hydrocolloid dressings for another 8 days. Wound closure was then performed by means of flap plasty over both buttocks



Figure A2:
The patient was discharged after débridement.



Figure B:
Dramatic deterioration of the wound situation, necrotic and infective wound conditions with putrescent odour.



Figure C1:
Status post surgical necrosectomy at first postoperative dressing change.



Figure A1:
Wound status at the first outpatient appointment.



Figure C2:
A diffuse bleeding site tamponaded with *Tabotamp*[®]. The rest of the wound cavity was draped with *Cutisorb*[®] *Sorbact*[®].



Figure F:
Postoperative result on 4th postoperative day.

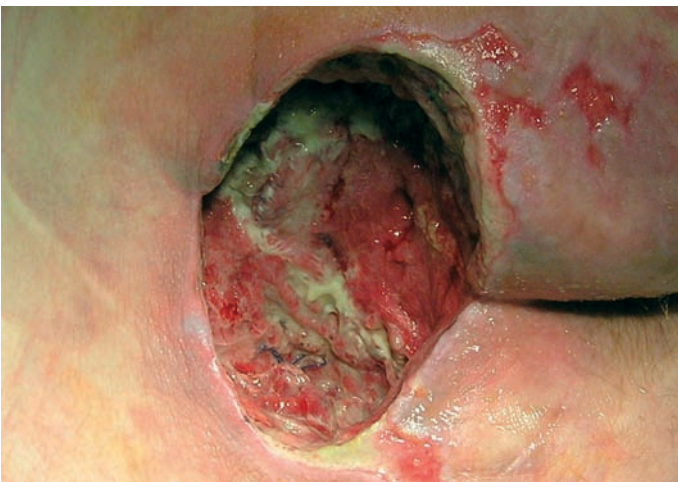


Figure D:
6th postoperative day. Small concentrations of necrotic material were still forming which were debrided daily. On the 8th postoperative day, good granulation commenced. No further necroses, no infection. Switch to moist wound treatment with hydrocol-dressings.



Figure E:
Wound status 24 hours preoperatively. Growth of granulation tissue from the wound bed.

Conclusions

When integrated into an overall therapeutic concept, antibacterial / antiinfectious treatment with *Cutisorb*[®] *Sorbact*[®] without the use of chemically active agents can be performed for local wound management. Both open and occlusive wound care is possible.

We observed no allergic reactions to the material in any of the patients we treated. None of our patients had to discontinue treatment with *Cutisorb*[®] *Sorbact*[®] due to deterioration of the wound or individual hypersensitivity reactions. Infections regressed within the same period as we had observed when using antiseptic solutions such as octenidine and polyhexanide or silver-containing combination preparations.

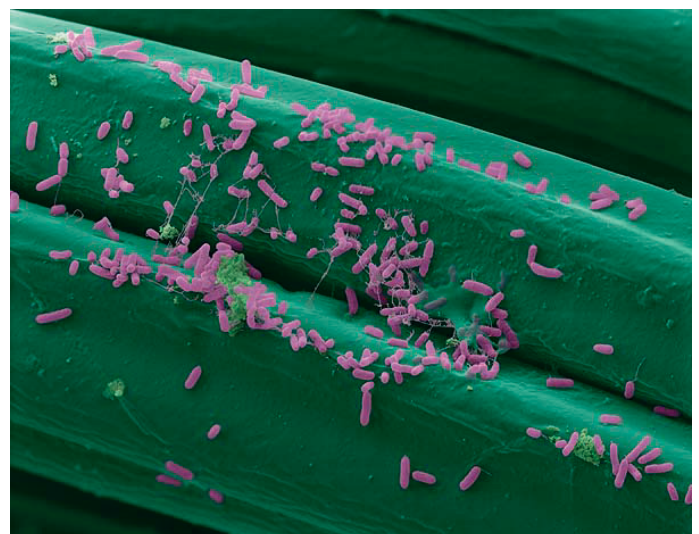


Figure 9:
Electron microscopic image of *Cutisorb*[®] *Sorbact*[®]: *Pseudomonas* bacteria are adhering to the dressing fibres.

We consider *Cutisorb® Sorbact®*, an antibacterial dressing without chemically active agent, to be both a good alternative therapy option and a valuable addition to existing methods of treating infected, colonized and contaminated wounds, since the dressing does not act directly on pathogenic and vital cells – the effect is purely physical. The physiological wound healing phases within the cellular structure are not compromised by inhibiting substances from the dressing material. There is also no undesired cell stripping or pain on changing dressings. The expectations we placed in this dressing were completely fulfilled.

Summary

- Infected and colonized wounds require frequent dressing changes. Dressings must not be left in place for longer than 24 hours.
- Contaminated wounds, usually of traumatic origin, should be treated prophylactically with antibacterial dressings.
- The factors responsible for infection, such as necroses, must be removed at an early stage.
- For secondary healing chronic wounds, consistent antibacterial / antiseptic procedures over 8 to 12 days are often sufficient to control infections locally. Semioclusive wound dressings can then be applied.

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