

! Artykuł jest dostępny na zasadzie dozwolonego użytku osobistego. Dalsze rozpowszechnianie (w tym umieszczanie w sieci) jest zabronione i stanowi poważne naruszenie przepisów prawa autorskiego oraz grozi sankcjami prawnymi.

DOROTA DOMAGALSKA¹ | ADAM BOBKIEWICZ¹ | TOMASZ DREWA² | TOMASZ BANASIEWICZ¹

URGOTUL® AG/SILVER DRESSING AS AN INTERMEDIATE LAYER IN NEGATIVE PRESSURE WOUND THERAPY IN A PATIENT WITH A CHRONIC WOUND AND HISTORY OF MULTIPLE LAPAROTOMIES

ZASTOSOWANIE OPATRUNKU URGOTUL® AG/SILVER JAKO WARSTWY POŚREDNIEJ W TERAPII PODCIŚNIENIOWEJ U PACJENTA Z NIEGOJĄCĄ SIĘ RANĄ PO WIELOKROTNYCH LAPAROTOMIACH

ABSTRACT: Treating of postoperative complications in patients after numerous laparotomies is difficult. In the case of dehiscence the surgical wound, infection and the coexisting formation of intestinal fistulas requires a multidisciplinary approach. In these cases, vacuum assisted therapy is very useful. However, it is necessary to protect the intestines, fistula and surrounding tissues from the action of polyurethane foam – protect the intestines and skin against ingrowing into the black foam. A 54-years-old male patient, with a history of numerous laparotomies was admitted to Clinic to treat complications after left-sided nephrectomy. The patient developed intestinal and enterocutaneous fistulas. Wound dehiscence and necrosis of surrounding tissues was present. Negative pressure wound therapy was applied. Dressing was changed three times. Correction of the stomy was performed. UrgoTul® Ag/Silver was applied each time between the wound and the polyurethane foam as a protective intermediate layer. The use of UrgoTul® Ag/Silver (in patients with infection, dehiscence of wounds, and with enterocutaneous fistulas) showed a significant decrease in the secretion from the intestinal fistula. Healing and closure of the surgical wound, its epithelialization and elimination of inflammation of the abdominal wall was observed.

KEY WORDS: intermittent layer, negative pressure wound therapy, post-operative wound infection, UrgoTul® Ag/Silver, wound dehiscence

STRESZCZENIE: Leczenie powikłań pooperacyjnych u pacjentów po licznych zabiegach w obrębie jamy brzusznej jest trudne. W przypadku rozejścia się rany pooperacyjnej, jej zakażenia oraz współistniejącego tworzenia się przetok jelitowych leczenie wymaga wielospecjalistycznego podejścia. Dobre zastosowanie w takich przypadkach ma terapia podciśnieniowa. Należy jednak pamiętać o ochronie jelit i przetoki oraz okolicznych tkanek przed działaniem gąbki poliuretanowej – chronić jelita i skórę przed wrastaniem w czarną gąbkę. W pracy przedstawiono opis przypadku 54-letniego pacjenta po licznych laparotomiach, przyjętego do Kliniki w celu leczenia powikłań po operacji nefrektomii lewostronnej. U chorego wytworzyły się przetoki jelitowe i jelitowo-skinne. Nastąpiło rozejście się rany i martwica okolicznych tkanek. Zastosowano leczenie terapią podciśnieniową, trzykrotnie zmieniając opatrunek i opracowując ranę chirurgicznie. Za każdym razem pomiędzy raną a gąbką poliuretanową stosowano UrgoTul® Ag/Silver jako ochronną warstwę pośrednią. Zastosowanie UrgoTul® Ag/Silver u pacjenta z zakażeniem i rozejściem się rany pooperacyjnej, a także z przetoką jelitowo-skinną skutkowało znacznym zmniejszeniem wydzielania przetoki jelitowej, wygojeniem i zamknięciem się rany pooperacyjnej, jej prawidłowym wynaskórkowaniem oraz wyeliminowaniem stanu zapalnego powłok brzusznych.

SŁOWA KLUCZOWE: przetoka jelitowa, rozejście się rany, terapia podciśnieniowa, UrgoTul® Ag/Silver, warstwa pośrednia, zakażenie rany pooperacyjnej

1 Department and Clinic of General, Endocrinological and Gastroenterological Oncology, Poznan University of Medical Sciences
2 Department of General and Oncologic Urology, Antoni Jurasz University Hospital No. 1 in Bydgoszcz

✉ **TOMASZ BANASIEWICZ**
Department and Clinic of General, Endocrinological and Gastroenterological Oncology, Poznan University of Medical Sciences, 49, Przybyszewskiego Str., PL-60355 Poznan, e-mail: tbanasiewicz@op.pl

Wpłynęło: 11.04.2018

Zaakceptowano: 20.04.2018

DOI: dx.doi.org/10.15374/LR2018013

- ! Artykuł jest dostępny na zasadzie dozwolonego użytku osobistego. Dalsze rozpowszechnianie (w tym umieszczanie w sieci) jest zabronione i stanowi poważne naruszenie przepisów prawa autorskiego oraz grozi sankcjami prawnymi.

INTRODUCTION

Treating complications after abdominal surgery is usually very difficult. It often requires a multidisciplinary approach to the therapeutic process. In open abdomen or fistula treatment, especially with a coexisting surgical site infection, negative pressure wound therapy (NPWT) is very useful [1]. Proper usage and indications include anatomic specificity and type of tissues in the wound. It is important to protect the intestines from direct contact with the polyurethane foam (black foam). It is important to protect the sensitive skin around the wound, oftentimes irritated by the inflammation. We can normally use protective foil or special dressings which create an intermittent layer between the skin (or deeper organs) and the black foam [2].

CASE REPORT

A 54-year-old male patient was admitted to our clinic due to complications after nephrectomy – history of peritonitis and subsequent laparotomies, enteric fistulas and an inflamed postoperative wound. In March 2017, the patient underwent laparoscopic left nephrectomy, which was complicated by a hemorrhage, which was managed surgically. Subsequently, relaparotomy was done due to necrosis of the sigmoid colon with perforation. Left hemicolectomy was performed with end transversostomy. Peritonitis and the abdominal abscesses were managed with lavage and drainage. The proximal 120 cm of the jejunum was resected. A jejunostomy was created. The rest of the small intestine was sutured. During the surgery, the necrotic abdominal layer was excised. In the postoperative period, an intestinal fistula in the surgical wound located in the left abdomen appeared. After a few weeks an appearance of the second fistula (enterocutaneous)

was observed. This was followed by fistula and inflammatory tumor excision. In June 2017, a new loop jejunostomy was created just above the enterocutaneous fistula, which helped stabilize the severe condition of the patient.

Because of the leakage of the intestinal content and the dehiscence of the postoperative wound, the patient was transferred to our clinic to undergo vacuum assisted therapy (Fig. 1).

Negative pressure wound therapy dressings were changed in the operating theatre three times. Reparation surgery of the dehiscenced wound and stomy were performed. We achieved almost complete healing of the wound.

Due to a large wound dehiscence, incompetent abdominal wall and potentially close contact of the dressing for vacuum therapy with the intestines, an intermediate layer of UrgoTul® Ag/Silver dressing was applied. UrgoTul® Ag/Silver protected the intestine, the fistula as well as the surrounding tissues from growing into the polyurethane foam (Fig. 2–4).

The wound was healed to the stage that we could use bags to cover the stomy and the fistula. Leakage was not observed and the wound showed no signs of inflammation. Epithelialization was improving (Fig. 5).

DISCUSSION AND RESULTS

Negative pressure wound therapy is a widely known technique used for supporting the treatment of chronic wounds. In the beginning it was used to treat burns, pressure ulcers, ulcers, diabetic foot syndrome and wounds caused by trauma. Going one step further, we started to use it in dehiscenced wounds, open abdomen, intestinal fistulas, anastomosis leakage (EndoVac®) or with skin grafts [1]. The typical dressing for vacuum therapy usually consists of a foam covered with a foil ensuring tightness, which is connected to a vacuum generating system with a catheter.

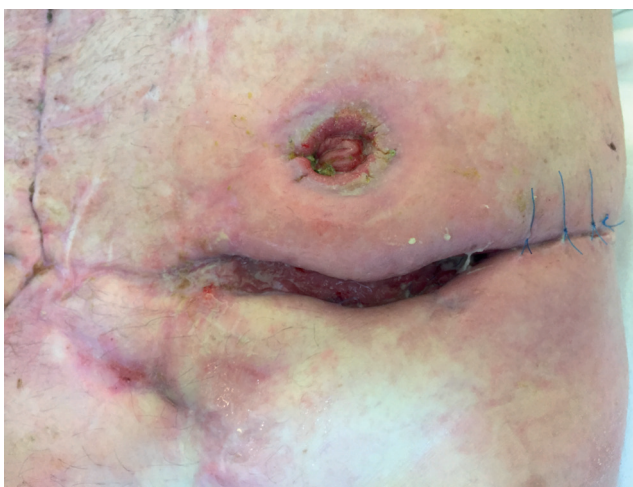


Fig. 1. Dehiscence of the post-operative wound with intestinal fistula in the bed of the wound, jejunostomy.



Fig. 2. UrgoTul® Ag/Silver applied on the wound as a intermittent layer, stomy paste seal.

- ! Artykuł jest dostępny na zasadzie dozwolonego użytku osobistego. Dalsze rozpowszechnianie (w tym umieszczanie w sieci) jest zabronione i stanowi poważne naruszenie przepisów prawa autorskiego oraz grozi sankcjami prawnymi.

We have two types of foams: polyurethane (so-called black foam) or polyvinyl (so-called white foam). Sometimes an ordinary sterile gauze may be used as a dressing [1].

Polyurethane foam is most commonly used in vacuum assisted therapy. The foam has a porous structure and its specific density allows distribution of the vacuum throughout the dressing. Despite the fact that foam promotes wound granulation, tissue may grow into its pores, which can later damage the granulation process. Changing dressings in this case is usually painful [3]. We should not use polyurethane sponges on delicate structures, such as nerves, vessels, but also tendons or bones [4–6].

The second type of foam is made of polyvinyl alcohol (the so-called “white foam”, which is hydrophilic). Tissue

does not grow into its structure and traumatization of the surrounding tissues is minimized. It is used as an intermediate layer between the wound and the black foam or as a separate layer [4–6].

Both the black and white foams are not an ideal dressing in vacuum assisted therapy. According to some, these foams are an additional reservoir of bacteria in the wound and tend to macerate the surrounding skin. Attempts have been made to modify standard dressings for vacuum therapy to eliminate its negative side effects. One of them is the introduction of an intermediate layer between the wound and the foam [4–6].

The intermediate layer between the wound and the foam should be permeable so as to limit interference with the negative-pressure therapy and should not promote local oedema.



Fig. 3. Application of polyurethane foam, foil to manage NPWT.



Fig. 4. NPWT dressing with an ostomy bag that ensures jejunostomy works properly.

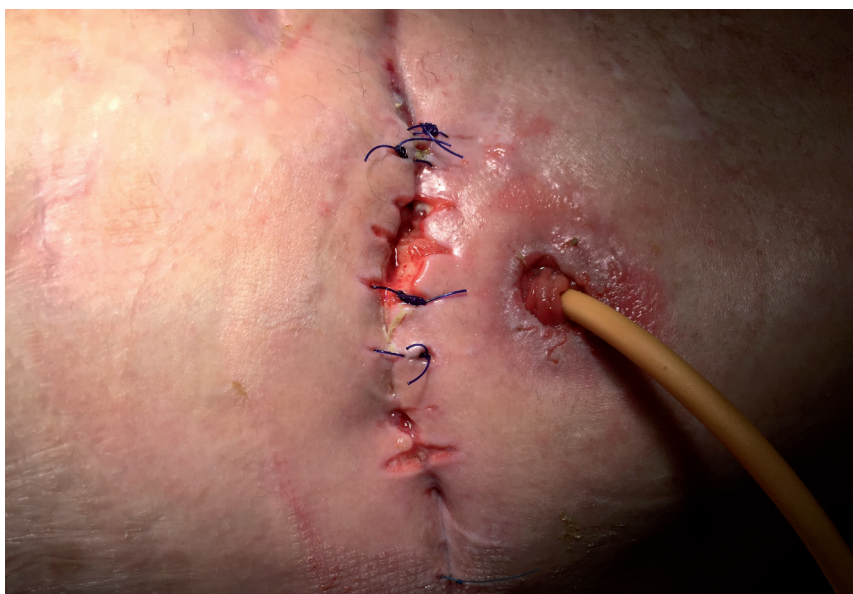


Fig. 5. Improvement of the wound condition to an extent enabling the use of ostomy bags and further reconstruction.

! Artykuł jest dostępny na zasadzie dozwolonego użytku osobistego. Dalsze rozpowszechnianie (w tym umieszczanie w sieci) jest zabronione i stanowi poważne naruszenie przepisów prawa autorskiego oraz grozi sankcjami prawnymi.

However, it should also not adhere to the wound or dressing or grow into freshly formed tissue. This intermediate layer should reduce the risk of pain and discomfort when changing the dressing.

It should additionally have properties promoting wound cleansing and healing – maintain a moist environment, which is bacteriostatic or bactericidal [7].

These criteria are fulfilled by the UrgoTul® Ag/Silver dressing. It is a lipid-colloidal, non-occlusive, non-adherent dressing impregnated with silver salts. UrgoTul® Ag/Silver has an antibacterial effect while maintaining the optimal level of moisture in the wound [8]. It also has good permeability which does not interfere with NPWT therapy.

The treatment of our patient suffering from an intestine fistula was very difficult, as the external orifice of the fistula was located in the dehiscence wound bed. Negative pressure wound therapy significantly improved the healing process. Discharge from the fistula irritates the surrounding tissues and causes necrosis. It leads to skin loss, causes pain and increases the risk of infection [2]. In treatment of these complications, we need to separate the fistula orifice, evacuate the discharge, protect the skin from destruction and improve epithelialization and granulation which leads to better tissue loss replacement [2]. Usually it is more important to create proper conditions for stomy management than to close the fistula. The latter being sometimes impossible. In the presented case, the above-mentioned goals were achieved. The wound has been healed to the extent, which enabled the use of ostomy bags and the general condition of the patient improved. This enabled the patient to be qualified for reconstruction surgery.

UrgoTul® Ag/Silver application in our patient, with infection and dehiscence of the postoperative wound and an enterocutaneous fistula resulted in decreased fistula

discharge, good healing and wound closure. Good epithelialization and inflammation reduction of the abdomen wall were also noticed. Negative pressure wound treatment and modern, specialized dressing combinations can have a significant impact on the quality and speed of wound healing. Most importantly, they reduce pain and patient discomfort during the treatment.

CONFLICT OF INTEREST: All Authors confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

REFERENCES

1. Banasiewicz T, Zieliński M. *Terapia Podciśnieniowa Ran*. 1st edn. Wydawnictwo Medyczne Termedia, Poznań, 2015.
2. Sun X, Wu S, Xie T, Zhang J. Combining a novel device and negative pressure wound therapy for managing the wound around a colostomy in the open abdomen. A case report. *Medicine* 2017;96(52):e9370.
3. Malmjsjo M, Gustafsson L, Lindstedt S, Ingemansson R. Negative pressure wound therapy-associated tissue trauma and pain: a controlled *in vivo* study comparing foam and gauze dressing removal by immunohistochemistry for substance P and calcitonin gene-related peptide in the wound edge. *Ostomy Wound Manage* 2011;57(12):30–35.
4. Malmjsjo M, Ingemansson R. Green foam, black foam or gauze for NPWT: effects on granulation tissue formation. *J Wound Care* 2011;20(6):294–299.
5. Malmjsjo M, Gustafsson L, Lindstedt S, Gesslein B, Ingemansson R. The effects of variable, intermittent, and continuous negative pressure wound therapy, using foam or gauze, on wound contraction, granulation tissue formation, and ingrowth into the wound filler. *Eplasty* 2012;12:e5.
6. Fraccalvieri M, Zingarelli E, Ruka E et al. Negative pressure wound therapy using gauze and foam: histological, immunohistochemical and ultrasonography morphological analysis of the granulation tissue and scar tissue. Preliminary report of a clinical study. *J Int Wound* 2011;8(4):355–364.
7. Banasiewicz T, Przała K, Machucka M. Warstwy kontaktowe jako uzupełnienie terapii podciśnieniowej ran. *Pielęg Epidemiol* 2016;3(66):18–20.
8. Harding K, Gottrup F, Jawień A. A prospective, multi-centre, randomised, open label, parallel, comparative study to evaluate effects of Aquacel® Ag and UrgoTul® Silver dressing on healing of chronic venous leg ulcers. *J Int Wound* 2012;9(3):285–294.