



Case Report

Severe Fascia Defect Unabling Direct Abdominal Closure Complicated by Wound Infection Successfully Treated with Open Abdomen Technique and Negative Pressure Wound Therapy in a Women Operated for Gynecological Malignancy, Case Report

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Abstract

Introduction: Laparotomy gynaecological surgery especially in oncological cases is accompanied by high risks of abdominal closure complication. In recent years, negative pressure wound therapy (NPWT) has been widely used for management of various complicated wounds and open abdomen (OA), and to support postoperative tissue healing by applying a controlled negative pressure to the wound bed.

Case Presentation: We present the case of a 76-year-old woman (gravida 7, para 5) with histologically verified endometriosis adenocarcinoma of the endometrium. She underwent laparotomy hysterectomy, bilateral overo-salpingectomy and correction of abdominal hernia by placing a synthetic mesh and on post-op day 21 the patient was readmitted to our centre due to wound dehiscence and severe infection of the abdominal fascia. Then we decided to start with a program of gradual fascial suture and application of negative pressure wound therapy with open abdomen

Discussion/Conclusion: Surgical site infections (SSI) and wound dehiscence remain a major obstacle for successful surgical procedures, causing slow healing times, prolonged hospital stay, and additional operations.

Negative pressure therapy (NPT) represents a strategy to treat deep mesh infections.

Keywords: Abdominal sepsis; Biosynthetic mesh/negative pressure wound therapy (NPWT)/open abdomen

Introduction

Sometimes abdominal incisions cannot be sutured directly forcing the surgeon to leave unclosed the abdomen and thereby initiating a period of open abdomen (OA) therapy. Meanwhile, a temporary abdominal closure (TAC) technique is used to protect the abdominal contents and to facilitate closure whenever intraabdominal and patient's overall condition is suitable. Usually surgical incisions are closed by fixing the edges together. However, in case of significant tissue loss, infected surgical field, or particular cases, wounds may be left open. Laparotomy gynaecological surgery especially in oncological cases is accompanied by high risks of abdominal closure complication [1-3]. In fact wide incisions as required for oncological cases, the high prevalence of obesity, previous deliveries and caesarean sections make female patients to be at risk for experiencing difficulties in abdominal closure, fascia defects and wound infections [4,5]. In recent years, negative pressure wound therapy (NPWT) has been widely used for management of various complicated wounds and open abdomen (OA), and to support postoperative tissue healing by applying a controlled negative pressure to the wound bed [6,7] With the introduction of negative pressure wound therapy (NPWT), the OA treatment techniques started to evolve. The novel vacuum-assisted wound closure and mesh-mediated fascial traction (VAWCM) technique, combining negative pressure wound therapy and fascial traction, was described from our department in 2007. After the introduction of the VAWCM technique, several authors have adopted the technique and published their results [8-11]. In a review article in 2017, 11 studies evaluating the VAWCM technique was included with high fascial closure rates reported in most populations, while long-term IH development was only reported in 3. In these populations, high IH incidence after VAWCM was evident [12].

Case Report

We present the case of a 76-year-old woman (gravida 7, para 5) with histologically verified endometriosis adenocarcinoma of the endometrium. On physical examination the patient weighed 60 kg, has a height of 145 cm, and a body mass index of 28.6. Reported comorbidities were arterial hypertension, senile dementia, previous multiple cerebral ischaemia's and she had undergone five years earlier umbilical hernia repair with placement of a mesh that had

ceded. Hysteroscopy and eye-guided biopsy revealed a moderately differentiated endometriosis adenocarcinoma of the endometrium. At transvaginal ultrasound (TVE) hyper echogenic endometrium with a maximal thickness of 2 cm on the uterine fundus was observed suggesting a myometrium invasion lower than 50% (Figo Stage Ia). Computed tomography (CT) scan was negative as regard as diffusion of the disease but confirmed the existence of a wide supra-umbilical and sub-umbilical hernias, both habited by the bowel. Due to the severe alterations of the abdominal wall, the presence of bowel in the hernia, the risk of adhesions and the need of reconstructing the abdominal wall a laparotomy approach was chosen. Surgery consisted in total laparotomy hysterectomy, bilateral overo-salpingectomy and correction of abdominal hernia by placing a synthetic mesh for the reinforcement of soft tissue weakness in order to reduce the risk of hernia recurrence. Post-surgery was uneventful and on post-op day 9 the patient was discharged. However, on post-op day 21 the patient was readmitted to our centre due to wound dehiscence and severe infection of the abdominal fascia. On postoperative day 30 the patient was re-operated. Surgery consisted in debridement of the surgical field, removal of the infected mesh and extensive viscerolysis.

After removal of mesh and necrotic tissue, the fascial gap measured 25x15 cm so that it was impossible to perform a direct suture of the fascia even applying dimensional techniques. Then we decided to start with a program of gradual fascial suture and application of RENASYS AB (SMITH&NEPHEW) negative pressure wound therapy with open abdomen (shown in Figure 1). The foam dressing of the vacuum sealing drainage (VSD) was inserted into the gap and the NPWT (negative pressure wound therapy) was performed with the pressure settled at 90 mmHg in continuous mode. Wound debridement, progressive fascial suture and VSD replacement always at a pressure of 90 mmHg, were performed for three times (every 48-72 hours). Wound dimension progressively decreased and granulation tissue formed a peritoneum-like tissue over the bowel (shown in Figure 2). The fascial gap turned to 11x12 cm in size. After 13 days from mesh removal, fascial closure was achieved using a biosynthetic mesh (BIO-A GORE 20x20 cm in size) secured with polypropylene 0 stitches to the residual fascia and placed over the peritoneum-like tissue achieved with NPWT. A partial suture of subcutaneous and cutaneous tissues was performed. The foam dressing of the VSD was inserted anteriorly to the mesh in the lower third of the wound. NPWT was performed with the pressure of 120 mmHg in continuous mode. After multiple wound revisions and NPWT therapy replacements, subcutaneous and cutaneous tissues in the

lower third of the wound were sutured. A small suction drain was placed anteriorly to the mesh which was removed six days following the procedure upon cessation of output. Functional and cosmetic outcomes were excellent and the patient was discharged home. At the moment she is on outpatient follow-up for endometrial cancer. (shown in Figure 3).



Figure 1: Negative Pressure Wound Therapy (NPWT) with open abdomen technique.

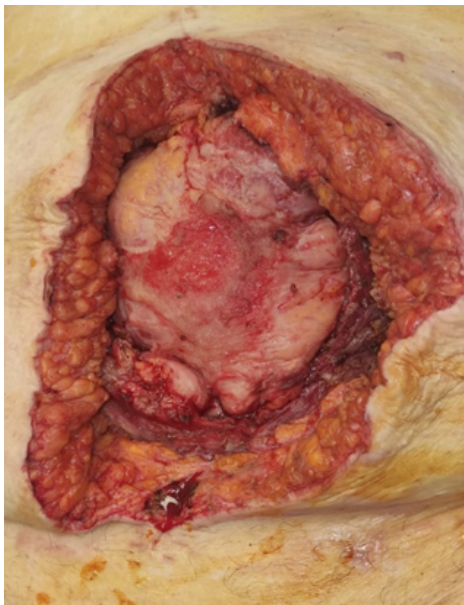


Figure 2: Peritoneum-like tissue after NPWT cycles, covering the bowel.

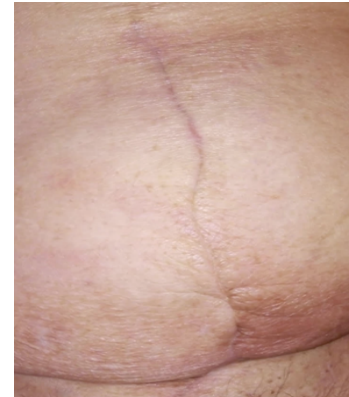


Figure 3: Final outcome.

Results and Discussion

Surgical site infections (SSI) and wound dehiscence remain a major obstacle for successful surgical procedures, causing slow healing times, prolonged hospital stay, and additional operations. Negative pressure therapy (NPT) represents a strategy to treat deep mesh infections. It provides a closed moist wound healing environment, removes excess fluid and reduces wound enema and promotes neovascularization and basement membrane integrity resulting in progressive wound closure. In the open abdomen (OA) technique it works in open abdomen providing mechanical containment of abdominal viscera, third space fluid loss estimation, and prevention of intestinal fistula and infection [13-15]. The association of NPWT and Biosynthetic mesh implant prevented us to adopt other reconstructive procedures, which could be much more invasive in our complicated patient, reduced time of hospitalization and improved total abdominal wall closure. The Biosynthetic mesh behaved like a scaffold for granulation tissue which growth was stimulated by negative pressure therapy allowing a final closure. The two procedures seem to combine perfectly together [8-12,16,17]. Negative pressure wound therapy (NPWT) is also emerging as a promising technology as a preventative intervention and is beginning to be advocated within care bundles in a variety of closed surgical incisions to reduce surgical site complications (SSC) and specifically SSI [18] bringing a significant impact on patients' lives and societal and healthcare costs.

Conclusion

Open abdomen technique associated with negative pressure therapy may be an useful approach for obtaining the successful closure of the abdominal wall in patients with wide fascia defects enabling direct suture especially in case complicated by wound infections.

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Conflict of Interest: Authors state no conflict of interest.

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