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Case Report

A successful Management Of Necrotizing Fasciitis Following Cesarean Section: A Case Report

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Abstract

A 28-year-old overweight woman with a BMI of 39.5 kg/m², gravida 3, abortion 1, and para 2 presented to the hospital on postoperative day 6 following a cesarean section, experiencing intense abdominal/incisional pain, body aches, chills, and subjective fevers. An emergent requested computed tomography (CT) scan of the abdomen and pelvis revealed signs of a necrotizing infection. The general surgery team was promptly consulted. The rapid and accurate identification of necrotizing fasciitis (NF), along with collaboration between the gynecology, surgery, internal medicine, and nephrology teams, were effective steps in the successful treatment and recovery of the patient. Upon reviewing the patient's treatment, it was evident that debridement, along with foam pressure dressing, contributed to tissue regeneration and improved healing.

Keywords: Necrotizing fasciitis; Cesarean section; Wound vacuum assisted closure; Case report

Introduction

Necrotizing fasciitis (NF), first documented by Fournier in 1883, is an uncommon yet fatal condition characterized by rapidly advancing inflammation and subsequent tissue death in the fascial layers and adjacent areas. According to the literature, the occurrence of NF ranges from 0.24 to 0.4 per 100,000 adults, with a mortality rate approximating 26.6% [1]. NF is generally an acute condition that develops swiftly over a few days. In about 80% of cases, it is a direct result of a bacterial infection that entered through a disruption in the skin barrier. Gram-positive cocci, particularly strains of Staphylococcus aureus and Streptococcus, are the cause of most of these infections originating from a single site. Polymicrobial infections also occur due to a mix of gram-negative and anaerobic involvement [2]. Risk factors such as diabetes, liver cirrhosis, and a history of alcohol consumption have been linked to NF [3,4]. Here, we present a case of a 28-year-old female who underwent a cesarean section and subsequently developed NF involving the abdominal wall, which necessitated serial surgical debridement of necrotic tissue and wound vacuum-assisted closure (VAC) placement.

Case presentation

A 28-year-old overweight woman with a BMI of 39.5 kg/m², gravida 3, abortion 1, para 1, was hospitalized for preterm membrane rupture and contractions at 35 0/7 weeks' gestation. The previous method of delivery was cesarean section. The patient's pregnancy faced complications due to gestational diabetes requiring insulin and lupus treated with prednisolone, which the patient stopped taking three days before the admission date

without consulting a doctor. We observed that the patient had a record of wound infection after the previous cesarean section; however, she acknowledged this after her readmission due to NF. The patient experienced no postpartum issues and was released 2 days after the cesarean section with the administration of antibiotics.

The patient presented to the hospital on postoperative day 6, experiencing intense abdominal/incisional pain, body aches, chills, and subjective fevers. The patient admitted that she stopped taking the antibiotic on day 4 after her cesarean section. Vital signs revealed a blood pressure of 100/61 mm Hg, a heart rate of 161 beats per minute, an oxygen saturation of 96%, a respiratory rate of 45, and a temperature of 39.2 ºC. The physical examination revealed a woman who appeared unwell, flushed, and in mild discomfort. Lung sounds were clear upon auscultation on both sides. The cardiac examination showed regular tachycardia. The abdominal examination revealed erythema that extended from the mons pubis to the umbilicus, accompanied by edema. A visible malodorous drainage was observed from the incision, and there was no crepitus in the abdominal wall. The laboratory results showed: white blood cell count 7.2 × 10^3/mcL, hemoglobin level 8.9 mg/dL, sodium concentration 144 mmol/L, creatinine level 1.7 mg/dL, glucose at 198 mg/dL, an erythrocyte sedimentation rate (ESR) of 125, and a prothrombin time (PT/INR) of 1.6.

An emergent requested computed tomography (CT) scan of the abdomen and pelvis revealed significant subcutaneous fat stranding, skin thickening, and multilobular fluid and gas present in the anterior abdominal wall near the incision (Figure 1).

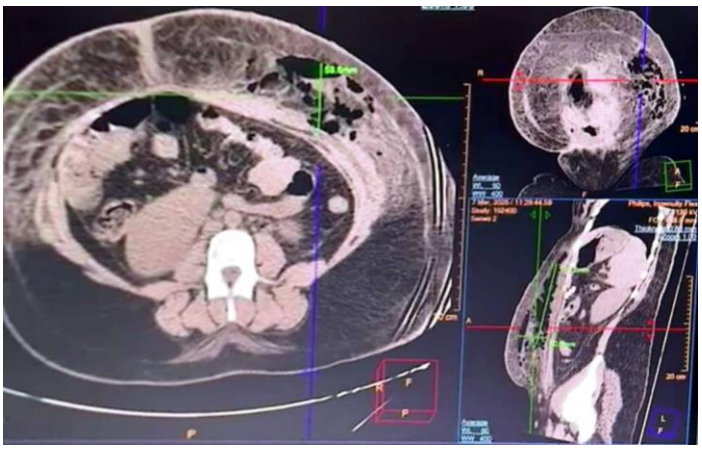

Figure 1: Computed tomography (CT) scan of the abdomen and pelvis revealed significant subcutaneous fat stranding, skin thickening, and multilobular fluid and gas present in the anterior abdominal wall close to the incision (Day 1).

The results were extremely worrisome for necrotizing infection. The general surgery team was promptly consulted.

Merrem (meropenem) was administered intravenously. The patient was taken to the operating room by the gynecology and general surgery teams for exploratory surgery and intraoperative support, as well as assistance with debridement and source control. During the operation, the previous Pfannenstiel incision was reopened. A purulent fluid was observed just beneath the skin, accompanied by necrotic subcutaneous tissue spreading over the anterior abdominal wall. Moreover, defects in the fascia were noted as well (Figure 2).

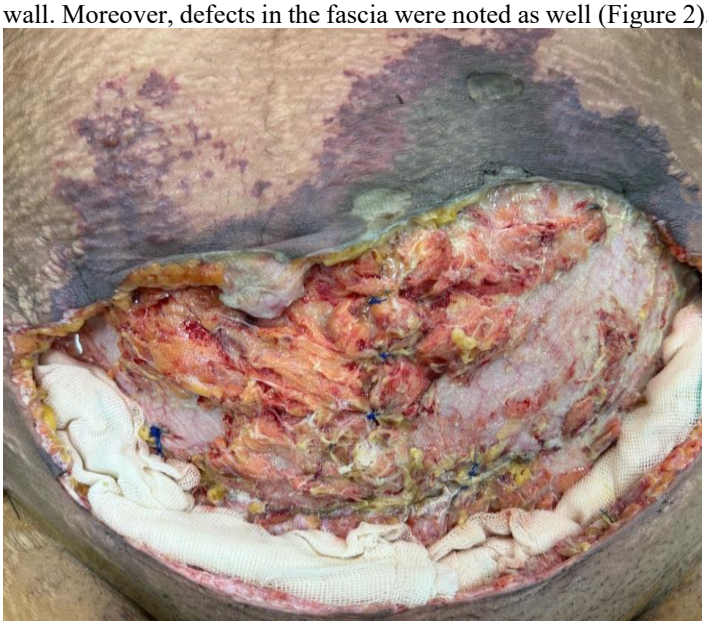

Figure 2: First presentation of patient. A purulent fluid was observed just under the skin, accompanied by necrotic subcutaneous tissue spreading over the front of the abdominal wall. Moreover, flaws in the fascia were observed as well (Day 1)

All necrotic tissue in the abdominal wall was debrided, and the excessive necrotizing fat was excised. The abdomen was secured with a sophisticated open abdomen dressing, and the patient remained under sedation. She was transferred to the intensive care unit with intentions for further debridement surgery. The tissue culture was notable for Klebsiella spp. The meropenem was persisted with. Due to significant anemia, 6 units of packed red blood cells were transfused to the patient on days 3, 7, and 9 of admission, with 2 units administered each time.

The patient returned to the OR each day for a week and then every three days. Aside from a necrotic section of the rectus muscles requiring additional debridement on day 5, the tissue appeared otherwise healthy and viable (Figure 3).

Figure 3A: healthy and viable tissue after debridement and abdominal wash sessions (Day 10).

Starting from day 10 , a wound vacuum-assisted closure was applied (Figure 4).

Figure 4: A wound vacuum assisted closure procedure. (Day 10).

Three sessions of vacuum-assisted closure, each lasting 72 hours, were conducted, which facilitated the tissue's excellent recovery (Figure 5).

Figure 5: A healthy and viable tissue after wound vacuum assisted closure (Day 13).

In the postoperative phase, the patient experienced a pre-renal acute kidney injury due to hypovolemia/sepsis, likely worsened by nephrotoxic drugs, and was effectively managed by the nephrology and internal team. Ultimately, the patient was closed on day 20 (Figure 6), and released on day 23. The patient who returned after 2 weeks appeared well and was advised to continue follow-up for at least 8 more weeks.

Figure 6: Closure day (Day 20)

Discussion

NF is an uncommon surgical complication, and quick identification and prompt treatment can save the patient from fatal risks. In the presented case, the patient had multiple risk factors, such as high weight, diabetes, autoimmune disease, use of immunosuppressive drugs, and inadequate antibiotic use after surgery, all of which can predispose the individual to developing NF. Early rupture of the amniotic sac may also potentially increase the risk of infection after cesarean delivery. The rate of surgical site infections following cesarean deliveries is quite significant. Women who experienced membrane rupture prior to delivery were more prone to developing surgical site infections after the cesarean section. Proper consideration must be given to administering prophylactic antibiotics to decrease the risk of surgical site infections following cesarean delivery [5]. Nevertheless, what mattered for this patient was the potential to recognize the risk of NF, and possibly preventative actions, such as an extended hospital stay to ensure the correct delivery of post-cesarean medications and observation for indications of wound infection, might have assisted in avoiding the onset of NF.

Rapid and accurate identification of NF and collaboration among the gynecology, surgery, internal medicine, and nephrology teams were effective steps in the successful treatment and recovery of the patient. Upon reviewing the patient's treatment, it was evident that debridement, along with a foam pressure dressing, contributed to tissue regeneration and improved healing. Vacuum-assisted wound closure is a type of dressing or therapy designed to promote wound healing. It is also referred to as 'a VAC' or 'negative pressure wound therapy ' (NPWT). The VAC system consists of multiple components. Throughout the treatment, a unique foam or gauze bandage is applied directly to the wound [6]. The vacuum-assisted closure is a non-pharmacological and non-surgical method for enhancing wound healing; it was initially proposed by Argenta and Morykwas in 1997 [7]. The application of vacuum reduces edema, infection, and improves local blood circulation, thereby facilitating healing. It is used as a complement or substitute for surgery for various wounds to decrease morbidity, costs, hospital stay length, and enhance patient comfort [8,9]. However, a recent systematic review revealed that VAC therapy is an effective approach, yet it does not surpass conventional dressing treatment. VAC involves fewer dressing changes , reduced pain, and a lower demand for painkillers; however, it necessitates more surgical procedures that require anesthesia [10]. We believe that a report on various cases illustrating the experiences of each center and medical team, along with their methods, can provide insight into the different strategies for managing NF cases.

Conclusion

This case underscores the importance of individualized risk assessment in postpartum patients, particularly after cesarean delivery complicated by comorbidities such as obesity, diabetes, and autoimmune disease. Early recognition of necrotizing fasciitis, prompt multidisciplinary collaboration, and the implementation of advanced wound management strategies, including serial debridement and foam-based negative pressure wound therapy, were crucial in achieving a favorable outcome. Tailored postoperative care and vigilant follow-up are vital to prevent rare but life-threatening surgical site infections in high-risk obstetric populations.

Declarations

Clinical trial number

Not applicable.

Ethics approval and consent to participate

Not applicable.

Consent for publication

The written permission from the patient on whom the report is based has been obtained.

Availability of data and materials

Videos and images related to the case are available from the corresponding author upon reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Author contributions

Sh.M. and K.B. presented the case. R.G. and M.S. contributed significantly to data collection. F.D., the primary contributor to the manuscript's commenting and editing. V.M. assessed the manuscript's scientific content critically. The final manuscript for submission was read and approved by all authors.

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