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Case report

NECROTIZING FASCIITIS AFTER CAESAREAN SECTION – PRESENTATION OF TWO CASES

НЕКРОТИЗИРАЧКИ ФАСЦИИТИС ПО ЦАРСКИ РЕЗ - ПРЕЗЕНТАЦИЈА НА ДВА СЛУЧАЕВИ

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Abstract

Necrotizing fasciitis is a rare, but serious soft tissue infection. It spreads extremely quickly, progresses with serious complications in a short period and can cause death. Accurate diagnosis, timely antibiotic treatment and a surgical approach to the treatment are important in its timely resolution. It is characterized by rapid progressive necrosis of the subcutaneous tissue and fascia. Necrotizing fasciitis is described by the appearance of severe pain at the operative site, crepitations, hard induration of the subcutaneous tissue, bullous lesions, skin necrosis and ecchymosis.

In this paper, we present two isolated cases of necrotizing fasciitis in female patients delivered with Caesarean section. Female patients aged 35 and 26 came to our Clinic for Gynecology and Obstetrics for delivery. Both patients were without previous childbirths and without past illnesses. The only risk factor present was obesity. Both pregnancies went well and without complications.

Clinical diagnosis and the doctor's focus must remain at the highest level, despite the rarity of the diagnosis, because early, timely diagnosis is of crucial importance. Early aggressive debridement of any necrotic tissue is the cornerstone of treatment and the beginning of series of debridement that offer the highest chance of survival.

Keywords: necrotizing fasciitis, infection, caesarean section, childbirth, soft tissue infection

Абстракт

Некротизирачки фасциитис е ретка, но сериозна инфекција на меките ткива. Таа се шири исклучително брзо, напредува со сериозни компликации за краток период и може да предизвика смртен исход. Точната дијагноза, навремениот антибиотски третман и хируршки пристап кон третманот се важни во нејзиното навремено решавање. Таа се карактеризира со брза прогресивна некроза на поткожното ткиво и фасцијата. Некротизирачкиот фасциитис се опишува со појава на силна болка на оперативното место, крепитации, тврда индурација на поткожното ткиво, булозни лезии, кожна некроза и екхимоза.

Во овој труд ќе прикажеме два изолирани случаи на некротизирачки фасциитис кај пациентки, породени со Царски рез. Пациентки на 35 и 26 годишна возраст се јавиле на нашата Клиника за гинекологија и акушерство, за породување. Обете пациентки без претходни раѓања и без минати заболувања. Единствен ризик фактор присутен кај обете пациентки е обезноста. Двете бремености поминале во добар тек и без компликации. Клиничкото дијагностицирање и фокусот на докторот мора да остане на највисоко ниво, и покрај реткоста на дијагнозата, бидејќи раната, навремена дијагноза е од крucијално значење. Раниот агресивен дебридман на кое било некротично ткиво, го формира темелот на третманот и почетокот на серијата дебридмани, кои нудат највисока шанса за преживување.

Клучни зборови: некротизирачки фасциитис, инфекција, Царски рез, породување, инфекција на меки ткива

Introduction

Childbirth by Caesarean section is one of the most common surgical interventions in our country. Postpartum surgical infection and wound infection are the most common reasons for prolonged hospitalization and

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represent a great burden on the health insurance fund, the clinics, the health personnel and patients themselves.
Necrotizing fasciitis is a rare but serious soft tissue infection. It spreads extremely quickly, progresses with serious complications in a short period and can cause death. Accurate diagnosis, timely antibiotic treatment and a surgical approach to the treatment of the infection are key in its timely resolution [1].
Necrotizing fasciitis, which occurs after delivery with Caesarean section is an extremely rare occurrence. Many factors have been described for soft tissue infections.
On the maternal side: smoking, limited access to medical care, obesity, use of corticosteroids, nulliparity and twin gestations. Intrapartum and operative factors: premature rupture of membranes, prolonged ventilation, especially in the second stage of labor, long incision length, thickness of subcutaneous tissue >3 cm, subcutaneous hematoma, lack of antibiotic prophylaxis, emergency ventilation and excessive blood loss [2].
Effective interventions to reduce surgical site infections include antibiotic prophylaxis, preparation of the skin for surgery with chlorhexidine instead of iodine, vaginal cleansing with povidone-iodine, removal of the placenta with the umbilical cord instead of manually, using hypodermic sutures for thickness of the subcutaneous tissue >2 cm, wound closure with monofilament nonabsorbable sutures. Our Clinic has strict protocols and rules to prevent and spread intrahospital infections, and surgical wound infections.

Epidemiology

Wound complications

Wound hematoma and seroma are collections of blood and serum, respectively. Hematomas are usually due to failure of primary hemostasis or a bleeding diathesis such as anticoagulant therapy. Strong coughing or hypertension immediately after surgery can contribute to hematoma formation. Wound hematoma or seroma is described in 2-5% of women giving birth with Caesarean section and may be the cause of wound dehiscence and subsequent infection [3].
Wound infection presents with erythema, discharge, induration of the incision and generally occurs 4-7 days postoperatively. When the infection develops in the first 48 hours, usually the causative agents are *Streptococcus spp*. from group A and B. Other common pathogens are: *Ureaplasma urealyticum*, *Staphylococcus epidermalis*, *Enterococcus faecalis*, *Staphylococcus aureus*, *Escherichia coli* and *Proteus mirabilis* [4].

Necrotizing fasciitis

Necrotizing fasciitis is a rare, serious infection that causes significant postpartum morbidity with Caesarean section. It is characterized by rapid progressive necrosis of the subcutaneous tissue and fascia. Necrotizing fasciitis is described by the appearance of severe pain at the operative site, crepitations, hard induration of the subcutaneous tissue, bullous lesions, skin necrosis and ecchymosis. The most important characteristic of this infection, which distinguishes it from other infections, is the extremely fast development and the importance of an immediate response. Computed tomography or magnetic resonance imaging confirm the diagnosis, showing signs of infection that has spread to the peritoneum and rectal muscles. Type I necrotizing fasciitis results from a polymicrobial infection that includes aerobic and anaerobic bacteria; Type II necrotizing fasciitis is generally caused by a single pathogen, group A streptococcus [5].

Case report

In this paper, we present two isolated cases of necrotizing fasciitis in female patients delivered with Caesarean section. Female patients aged 35 and 26 came to our Clinic (35-year-old patient, Patient A, and 26-year-old patient, Patient B).
Both patients were without previous childbirths and without past illnesses. The only risk factor present in both patients was obesity. Both pregnancies went well and without complications. They gave birth to healthy children with an Apgar score of 8/9.
During hospital treatment, they received a standard therapy with antibiotics, analgesics, NSAIDs, fluid therapy, antiaggregant and gastroprotective therapy. The postoperative course went smoothly, after which they were discharged for home treatment. Patients came for an examination after 7 days (A) and 10 (B) days, with pain in the operative wound, elevated body temperature up to 38 ˚C, tachycardia, with a feeling of weakness and nausea. Local examination showed erythema above and below the surgical incision; a hematoma was present in both patients with a diameter of 7 cm (A) and 3 cm (B).
In patient B, a bulla was present above the hematoma. Surrounding region was red, warm and indurated, painful to palpation. From the wounds, a seropurulent bloody content was drained, which had a distinct foul smell. The patient was admitted to the hospital for further treatment. Laboratory findings taken on the day of admission went in favor of a systemic infection.

Table 1. Laboratory findings of patients on readmission to the hospital

	Patient A	Patient B	Lab. results
wbc	14.51	11.7	[4-10]x10^9/L
hgb	108	83	120-180 g/L
hct	0.320	0.231	0.350-0.550 L/L
plt	265	110	[150-450]x10^9/L
crp	272	317	< 5 mg/L
d-dimer	3559	2656	[0-500] ngr/mL

Swabs were taken from the operative wound, vaginally and cervically. Computed tomography scans of the abdomen and small pelvis were performed. Emirian double antibiotic therapy was started with amp. Cephtriaxon a 2 gr s.1x1 and amp. Metronidazol a 0.5 gr s.3x1, as well as with antiaggregation therapy with amp. Clexane a 0.6 s.1x1. Primary therapy included fluid rehydration, analgesic and gastroprotective therapy.
Description of computed tomography of the abdomen and pelvis: abdominal organs with a normal morphology, passable and without signs of the presence of an abscess. A defect was noted on the anterior abdominal wall at the level of the small pelvis, which protruded to the peritoneum, but did not penetrate it. The fascia was thickened, and the subcutaneous fat, cloudy with air inclusions present and signs of necrosis. The uterus was enlarged and with a slight local reaction, post-operative condition; both adnexa normal, without free fluid in the pouch of Douglas.

Fig. 1. Photograph of the wound on the day of readmission (patient A)

Results of the obtained swabs. The swabs from the vagina and cervix in patient A were negative for pathogens and noted the absence of normal flora, while in patient B the vaginal swab was positive for *Enterococcus* and *Escherichia coli*.
Result of a wound swab in patient A – *Enterococcus spp*. and patient B – *Streptococcus agalacticae* gr. B.
Colleagues from the Clinic for Plastic Surgery were

Fig. 2. Photograph of the wound on the day of readmission (patient B)

invited for consultation, examination and opinion on further treatment. An incision was made and the wound was washed abundantly with sol. NaCl 0.9%, sol. Betadine, sol. Hydrogen 3%, antiseptic Microdacyn. Clean ampoules of antibiotic Clindamycin and gauze soaked in hypertonic solution sol. NaCl 10% were applied locally. In the further treatment of the wounds, dressings with silver gauze, debridement and excision of the devitalized tissue were used.
Dressings were done daily, regularly, and this included vaginal douching. Amp. Vancomycin a 1 gr s.3x1 was included in both patients on the third day of hospitalization. During the hospital treatment, transfusion of blood derivatives was applied.
During the hospital stay, regular laboratory tests were performed every two days, and control swabs were taken on two occasions. When results from control swabs were negative, secondary closure was performed in both patients. The duration of hospitalization in the patients lasted about 1 month. Both patients were discharged in a good general condition, with negative smears and normal laboratory parameters.

Table 2. Laboratory findings of the patients at discharge from the re-hospital treatment

	Patient A	Patient B	lab. results
wbc	6.5	6.2	[4-10]x10^9/L
hgb	128	108	120-180 g/L
hct	0.39	0.33	0.350-0.550 L/L
plt	336	452	[150-450]x10^9/L
crp	17.5	12.6	< 5 mg/L
d-dimer	921.8	447	[0-500] ngr/mL

Fig. 3. Photograph of the wound on the day of discharge (patient A)

Discussion

Necrotizing fasciitis is a fulminant infection involving extensive areas of soft tissue necrosis, commonly involving the extremities, perineum, and abdominal wall. As in our cases, a minor penetrating injury or surgical incision is usually involved, with postoperative cases accounting for 20% of the total number of fasciitis cases.

While group A *Streptococcus* is the most common monomicrobial isolate, polymicrobial infections with a variety of Gram-positive, Gram-negative, aerobic, and anaerobic isolates can also occur. In our case we had *Enterococcus spp*., which is a Gram-positive coccus (normal for intestinal flora) and *Streptococcus agalactiae*, a beta-hemolytic Gram-positive coccus (the most common microbial pathogen in humans) [6].

The etiology of necrotizing fasciitis is not fully understood. Major risk factors include type 2 diabetes and age over 50 years, which are always associated with higher rates of morbidity and mortality. These factors were absent in our cases, but cases with necrotizing fasciitis have been reported after the use of NSAIDs (non-steroidal anti-inflammatory drugs) immediately after delivery with Caesarean section.

NSAIDs are associated with necrotizing fasciitis in a temporal manner. Controversial is the claim that NSAIDs only mask the primary signs and symptoms and delay the diagnosis of necrotizing fasciitis. Inhibition of granulocyte chemotaxis, phagocytosis, bactericidal activity and reduced lymphocyte transformation have been documented *in vivo* as a consequence of NSAID use in this type of patients [7].

Most patients have signs of inflammation such as erythema, swelling and pain at the infected site. Severe pain, which does not correlate with local findings and presents with a systemic infection, should direct our attention to the suspicion of necrotizing fasciitis.

The native graph of the abdomen in the standing position reveals the presence of gases in the muscles and superficial fat only in 35% of cases. Computed tomography is the diagnostic approach of choice. It helps us distinguish the involved structures, the type of infection and helps in the decision on further treatment. A normal finding on computed tomography, on the other hand, does not exclude the diagnosis. Despite patients' unstable condition, surgical debridement should be done continuously and not delayed until the condition is stabilized.

It is important to note that serial debridements are required and that fascial closure is not recommended after the first debridement. Leaving the abdomen open as in these two cases is consistent with infection control techniques and prevention of abdominal compartment syndrome. With serial debridements and regular dressings, the final defect that needs to be reconstructed is reduced over time. After obtaining two consecutive negative wound swabs, and granulation tissue present, we performed a final dressing and closure of the fascia and superficial skin layers [8].

Conclusions

Postpartum necrotizing fasciitis remains a rare challenge, with high mortality. The rapid deterioration of the condition in both patients with septic shock and multisystem organ failure could result in death. Clinical diagnosis and the doctor's focus must remain at the highest level, despite the rarity of the diagnosis, because early, timely diagnosis is of crucial importance. Early aggressive debridement of any necrotic tissue is the cornerstone of treatment and the beginning of a series of debridements that offer the highest chance of survival.

Conflict of interest statement. None declared.

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