Case Report

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Necrotizing Fasciitis Following Oocyte Retrieval: Case Report of A Rare Occurrence

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ABSTRACT

Necrotizing fasciitis (NF) is a relatively rare but serious and potentially fatal, soft tissue infection characterized by a rapidly spreading bacterial infection in the subcutaneous tissues. This article describes a 41-year-old patient diagnosed with acute NF following oocyte retrieval for infertility. The oocyte retrieval procedure was uneventful. Within the next few days, she presented with high fever and acute abdominal findings, and the diagnosis of NF was confirmed. The most effective management for NF is rapid primary diagnosis and surgical debridement. The gold standard treatment includes intravenous antibiotics, surgical debridement, and intensive care. Due to possible gastrointestinal complications triggering NF, the patient underwent colostomy along with necrosectomy. The purpose of this report is to review the comprehensive treatment, management, and experience of NF and to emphasize the role of a multidisciplinary care team in improving this patient's condition.

Keywords: Necrotizing fasciitis, oocyte retrieval, infection

INTRODUCTION

Necrotizing fasciitis (NF) is a rapidly progressive infection mostly affecting the fascia and subcutaneous layers.[1] The clinical manifestation and the course of NF are variable, and different etiological microorganisms may be involved. In any case, prompt surgical intervention is deemed critical for the final outcome.[2] On the other hand, the lack of specificity of symptoms at presentation or admission and the rapid progression of septic shock and multiple organ failure often make rapid clinical diagnosis challenging.[3]

Patients with NF frequently present with symptoms of systemic infection.[4] NF is classified into four types. Type I accounts for 70-80% of cases with polymicrobial or synergistic causes. Responsible microorganisms include gut flora-derived mixed anaerobes and aerobes, *Eschericia coli*, *Pseudomonas spp.*, and *Bacteroides spp*. Type II accounts for 20-30% of cases and is usually monomicrobial. Responsible microorganisms include bacteria originating from the skin or throat, Group A beta-hemolytic *Streptococcus*, and sometimes *Streptococcus aureus*. Type III and IV are less common.[5]

The only treatment option for NF is surgical debridement of necrotic tissue and broad-spectrum antibiotic therapy.[6,7] The mortality rate for NF varies between 11% and 22% in different studies and can reach 16% to 33% when associated with streptococcal toxic shock syndrome.[8]

CASE REPORT

Written and verbal consent was obtained from a 41-year-old patient experiencing infertility due to fallopian tube blockage caused by endometriosis, and an oocyte pickup (OPU) (egg retrieval) procedure was performed, and his eggs were collected. Two days after the OPU procedure, she presented with high fever and acute abdominal findings. Blood test results showed a white blood cell count of 2.79 $\times 10^3/\mu$L, a neutrophil ratio of 61.4%; hemoglobin of 6.7 g/dL; thrombocytes of 86 $\times 10^3$ /μL; C-reactive protein 225.2 mg/L; procalcitonin 31.56 ng/mL; total protein 5 g/dL; albumin 2.4 g/dL; aspartate aminotransferase 33 U/L; alanine aminotransferase 12 U/L; total bilirubin 1.12 mg/dL; creatine kinase 709 U/L; blood urea nitrogen 5 mg/dL; creatinine 0.45 mg/dL; sodium 138 mEq/L; and potassium was 2.52 mEq/L. Plain computed tomography scans revealed intra-abdominal changes (Figure 1a and b).

Wong and colleagues developed a laboratory risk indicator score for NF, they termed Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) (Table 1).[9] They identified six independent laboratory parameters associated with NF. The classification of patients and the likelihood of NF using LRINEC are shown in Table 2.[10]

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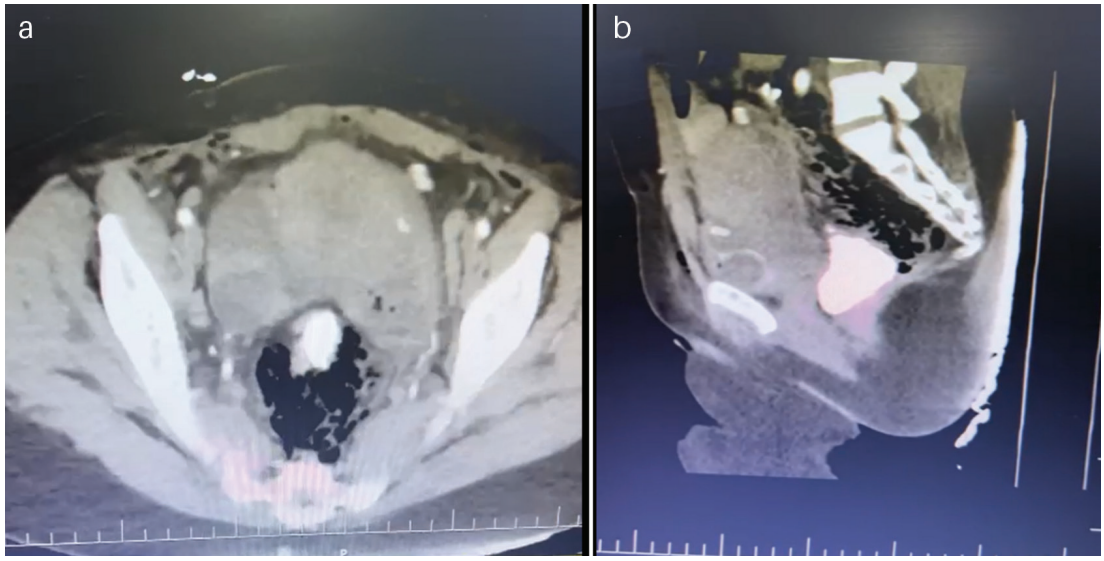

Figure 1. a) and b) show widespread intra-abdominal gas accumulation due to necrosis

Radiological evaluation has also been used in the diagnosis of NF. Radiographic examinations may reveal gas accumulation in the subcutaneous tissue, but gas is not seen in most patients.[11] Magnetic resonance imaging (MRI) has high sensitivity (93-100%) for the diagnosis of NF. MRI may reveal liquefactive necrosis and fascial fluid accumulation caused by inflammatory edema.[12,13]

In the presented case the LRINEC score was 8 suggesting a likelihood of NF of >75% so NF was suspected, and general surgery was contacted immediately. Emergency surgery was performed; exploration revealed patchy necrotic foci on the mesosigmoid colon and serosal surface, with necrosis of the mesorectum distally from the rectosigmoid region. The rectum and mesorectum were resected unblocked up to the levator muscle plane. The operation was completed with the maturation of the end colostomy. Postoperatively, the patient was transferred to the intensive care unit. The patient has fully recovered and preparation for the transfer of oocytes obtained during OPU will begin.

DISCUSSION

NF is a severe infection of the subcutaneous tissue characterized by necrosis of the subcutaneous tissues and fascia, and usually results from Group A beta-hemolytic streptococcal infection or polymicrobial synergistic infection.[14] The mortality rate from this condition is high if left untreated or if treatment is delayed. Due to the rapidly progressive nature of the infection, early diagnosis and definitive treatment are extremely important.[15-17] The incidence of this disease has increased approximately fivefold in the last decade, which may partly be due to an increase in the number of immunocompromised patients and may even be due to more frequent reporting in recent years. A recent publication reported mortality rates ranging from 30% to 90%.[17] As reported in a 2010 study, gastrointestinal symptoms are also a possible predictor of serious outcomes in invasive group A streptococcal infections.[18]

Most published cases of NF are secondary NF and have a known etiology.[19] There are many risk factors that contribute to the onset of NF. Risk factors such as diabetes, obesity, smoking, and corticosteroid use can facilitate the development of the condition and can also have a negative impact on the course of the NF.

The most important factor in the treatment of NF is early diagnosis because of its rapid progress. Diagnosis is based primarily on clinical findings. The most important factor may be clinical awareness of NF in the physician first evaluating the patient. NF can easily be confused with other soft tissue infections that clinically present with erythema. In the presented case the irregular borders of erythema in the patients' lesions and the presence of pain and tenderness beyond the affected area facilitated the diagnosis of NF. NF should also be suspected in cases of rapid progression of clinical findings despite antibiotic treatment, and the diagnosis should be supported by laboratory and radiological imaging methods.

Marking the borders of the existing erythema with is useful for closely monitoring progression. The LRINEC scoring system is a highly sensitive method, although not specific.[9] In this case, the patient's LRINEC score was 8 and radiological imaging methods supported the diagnosis of NF but were not diagnostic on their own, as they include nonspecific findings such as facial thickening, widespread fluid accumulation, and edema. The most important way to control infection in NF is to debride all necrotic tissues as early as possible. In addition, when there is only irregularly bordered erythema and swelling on the skin surface, NF should be considered and surgical exploration should be performed. Finding necrosis and infection in the deep planes after passing through the subcutaneous tissues are findings suggestive of NF. In such cases, debridement should be continued until healthy, bleeding tissue is reached, and all necrotic tissue should be removed from the environment. There are numerous publications indicating that early, aggressive debridement reduces mortality rates.[20,1]

Tablo 1. Laboratory Risk Indicators for Necrotizing Fasciitis (LRINEC)

Value	LRINEC score
C-reactive protein (mg/L)	
<150	0
>150	4
White blood cell count (cells/mm³)	
<15	0
15-25	1
>25	2
Hemoglobin level (g/dL)	
>13.5	0
11-13.5	1
<11	2
Sodium level (mmol/L)	
≥135	0
<135	2
Creatinine level (mg/dL)	
≥1.6	0
<1.6	2
Glucose level (mg/dL)	
≤180	0
>180	1

Table 2. Staging of necrotizing fasciitis according to the LRINEC score

Stage	Score	Probability of necrotizing fasciitis (%)
Low	(<5)	50
Moderate	(6-7)	50-75
High	(>8)	>75

LRINEC: Laboratory Risk Indicators for Necrotizing Fasciitis

Although serial and aggressive debridement is life-saving, limiting it to necrotic tissues only is of great importance, especially in terms of preserving functional structures. Therefore, debridement should be performed by an experienced surgeon who is familiar with the anatomy of the area. Subsequently, the patient should be closely monitored and the debridement procedure should be repeated if necessary.

Although intervals of 24-48 hours are suggested in the literature for redebridement, there is no complete consensus.[10]

CONCLUSION

The clinical significance of this case report is that NF must be addressed early and aggressively. Clinical evaluation and a high index of suspicion for NF will ultimately expedite diagnosis and successful therapy. Treatment for NF is surgical, and the earlier the surgery is performed, the better the outcome.

Ethics

Informed Consent: Informed consent was obtained from the patient.

Footnotes

Authorship Contributions

Surgical and Medical Practices: H.G., S.H.K., Concept: H.G., S.H.K., Design: H.G., S.H.K., Data Collection or Processing: H.G., S.H.K., Analysis or Interpretation: H.G., S.H.K., Literature Search: H.G., S.H.K., Writing: H.G., S.H.K.

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