Available online at www.ijicr.com

e-ISSN: 3048-9814 (Online)
Vol. 2 No. 3 (2025)
March 2025 Issue

INDIAN JOURNAL OF INNOVATIVE CLINICAL RESEARCH

Received 16 January 2025
Revised 21 February 2025
Accepted 6 March 2025

CASE REPORT

Necrotizing Fasciitis of the Abdominal Wall Following Laparoscopic Cholecystectomy

Dr. Zafrul Islam, Junior Resident, Department of General Surgery, Katihar Medical College, Katihar, Bihar, India

Abstract

Necrotizing Fasciitis (NF) is a fast-growing infection of the body's soft tissue marked by widespread tissue death and signs of toxicity. The usual reason for RBC after trauma or a weakened immune system, but this condition rarely happens as a laparoscopic cholecystectomy side effect. We describe the elective laparoscopic operation performed on a 42-year-old obese lady with diabetes from rural Bihar because she was having symptoms of cholelithiasis. Two days after the surgery, there was high fever, great discomfort in her right abdomen wall, redness and crepitus around the trocar site. The patient's condition worsened right away which prompted a fast evaluation. Tests showed subcutaneous gas and increased inflammatory markers. CT imaging with contrast dye found necrotizing fasciitis in the patient. The nurse rushed the patient to surgery and on evaluation, it was recognized that there was substantial necrosis of the deep tissue. A variety of antibiotics, critical care, many debridements and VAC treatment were all used. After being in the hospital for 21 days, the patient needed skin grafts to cover the open second wound. It reminds us that we should always have a strong suspicion for NF in patients after laparoscopic surgeries, more so in patients who are at risk. Spotting the condition and operating fast increases a patient's chances of survival.

Keywords: Necrotizing Fasciitis, Laparoscopic Cholecystectomy, Abdominal Wall Infection, Surgical Complications, General Surgery, Bihar, India

Available online at www.ijicr.com

e-ISSN: 3048-9814 (Online)
Vol. 2 No. 3 (2025)
March 2025 Issue

INTRODUCTION

Necrotizing fasciitis (NF) is an uncommon infection of the soft tissues that often ensues very quickly and severely, spreading along the fascia. This disease is mainly divided into Type 1 (polymicrobial) and Type 2 (monomicrobial) and Group A Streptococcus is its most common cause. We see type 1 diabetes more frequently in individuals who have other conditions that affect their immune system such as diabetes mellitus, chronic kidney disease or cancer. Typically, the infection starts in the lower tissue and spreads quickly along the nearby fascia, involving the skin above.

Even though laparoscopic cholecystectomy is normally thought of as safe and simple, it has been reported to cause rare but severe infectious issues such as NF. In most cases, NF appears after trauma, open surgery or perineal infections. Laparoscopy can be so effective that early NF symptoms are often missed, resulting in more cases of complications and death.

The problems caused by infectious diseases are greater in rural Bihar, India, because of sparse infrastructure, weakened economy and delays in acquiring care at specialized health services. Therefore, spotting and handling NF in its early stage becomes essential because of these constraints.

The main message here is to catch warning signs in high-risk surgery patients early, know how NF harms the body and use quick, coordinated action in difficult settings.

CASE PRESENTATION

Patient Profile: A 42-year-old woman, who lived in a faraway village in Sitamarhi district, Bihar, came to the surgical outpatient clinic because she had random right upper abdominal pain for six months that could be set off by eating fatty meals. I could feel a steady or almost nonexistent ache from the front of my stomach and through the back. She said she sometimes experienced bloating and nausea.

Medical History: For over 10 years, the patient had poorly controlled type 2 diabetes mellitus (HbA1c: 9.2%) and obesity (BMI: 33.4 kg/m^2). There was no regular insulin therapy for her and she had trouble managing her blood sugar levels. She assured us she had not undergone abdominal surgery, suffered trauma or received corticosteroid use. None of my immediate family had ever experienced autoimmune or connective tissue illnesses.

Preoperative Assessment and Procedure: When examined clinically, there was mild discomfort in the patient's right upper abdomen. There was no indication of either mass or organomegaly upon physical examination. Ultrasound images of the abdomen found that the gallbladder was small, some stones were seen and the walls were thick, all signs of long-standing gallbladder inflammation. Laboratory examinations noted a white blood cell count above

e-ISSN: 3048-9814 (Online)
Vol. 2 No. 3 (2025)
March 2025 Issue

11,000 mm^3, a blood sugar of 287 mg/dL and no problems with the liver indicating normal functioning of the organ.

The patient's treatment was planned as elective laparoscopic cholecystectomy. A Veress needle was used with the closed technique to make space inside the abdomen by inserting a 10 mm port below the umbilicus. The epigastric, right midclavicular and right anterior axillary lines all received an accessory port. The gallbladder was removed from Calot's triangle and taken out through the umbilical port. The bleeding stopped, so the surgeon closed the fascia with 1-0 polyglactin. After the operation was performed, the patient remained stable and transferred to the ward.

Postoperative Course: By postoperative day 2, the patient was running a high fever (102.8°F), complained of pain in the right periumbilical area and showed more redness around the umbilical port. The pain was much worse than what could be seen on the body. The examination found a small area of hardness, tenderness and a noticeable crackling sound when touched. The wound was not draining, but the skin covering it looked tense and pale.

Investigations:

The second blood test showed a high WBC count (24,000/mm^3), increased CRP (223 mg/L), a high serum creatinine (1.4 mg/dL) and elevated serum lactate (4.1 mmol/L). Blood sugar was 326 mg/dL while the result of arterial blood gas test revealed metabolic acidosis (pH 7.28, HCO_3^-: 18 mmol/L).

Extensive air under the skin was seen on the CT scan, starting at the right paraumbilical area and ending in the right iliac fossa, along with thickened fascia and fluid pockets, both signs of early necrotizing fasciitis.

Initial Management and Emergency Surgery: The clinical findings and imaging led to the diagnosis of necrotizing fasciitis in the patient's abdominal wall. Meropenem (1g every 8 hours), clindamycin (600 mg every 6 hours) and vancomycin (1g every 12 hours) were given intravenously as broad-spectrum empiric antibiotics.

The patient was brought into the operating room to have the wound cleaned in an emergency while under general anesthesia. During the operation, there was extensive dead tissue in the subcutaneous layer and the anterior abdominal fascia, along with dishwater-colored pus and loss of the tissue planes on the right side of the abdomen. Necrotic tissue was removed until the bleeding edges became healthy. The samples underwent examination by histopathology and microbiology.

Postoperatively, she was taken to the surgical ICU and treated with the help of vasopressors, insulin, electrolyte balance and fluids. Tests on blood cultures came back negative. Analysis of wound cultures revealed that E. coli, Streptococcus pyogenes and Bacteroides fragilis were present together. The drugs were chosen for the patient as piperacillin-tazobactam and metronidazole, according to the findings of the sensitivity tests.

e-ISSN: 3048-9814 (Online)
Vol. 2 No. 3 (2025)
March 2025 Issue

Serial Debridement and Recovery: On postoperative On days 4 and 6 after surgery, the surgical site was cleaned by serial debridement under general anesthesia. The wound was cleaned with saline and watered-down povidone-iodine solution and all dead tissue was taken out. The patient received Negative Pressure Wound Therapy (VAC therapy) on day 7 to help the wound heal and control any infection. The patient responded favorably, with decreasing inflammatory markers and improving glycemic control.

Repeat CT scan on day 10 showed no residual gas collections or fascial extension. Granulation tissue developed steadily over the exposed wound bed. After 14 days of VAC therapy and stabilization, a split-thickness skin graft harvested from the left thigh was applied for secondary closure on day 19. Graft take was 95%, and she was discharged on day 21 in stable condition with instructions for outpatient wound care and endocrinology follow-up.

DISCUSSION

Necrotizing fasciitis is a serious infection that may be fatal if it is not spotted early and treated. Even though laproscopic procedures are generally safe, some patient and doctor-related factors can cause complications.

Predisposing Factors: In our patient, several predisposing factors were observed:

- **Diabetes mellitus:** Hyperglycemia breaks neutrophil functionioning,causes tissue to lack blood and allows bacteria to multiply fast .
- **Obesity:** Wounds are slow to heal, blood flow to the area is reduced and it is more difficult to assess early in the clinic.
- **Delayed recognition:** Early signs of NF such as unexplained severe pain, are frequently mistaken for typical postoperative pain.

Pathophysiology: NF typically begins in the superficial fascia and spreads along the fascial planes, facilitated by bacterial toxins and enzymes like hyaluronidase. The thrombosis of subcutaneous blood vessels contributes to ischemia and necrosis. Polymicrobial synergy—especially anaerobic and facultative organisms—accelerates tissue destruction. The presence of E. coli, S. pyogenes, and Bacteroides in our case is consistent with Type 1 NF.

Diagnostic Challenges: NF mimics cellulitis in early stages. Key distinguishing features include:

- Severe pain out of proportion to clinical findings
- Rapid progression of erythema
- Systemic signs of sepsis
- Crepitus or skin necrosis
- Imaging evidence (CT/MRI) of gas in soft tissues

In resource-limited settings like rural Bihar, reliance on clinical judgment remains paramount, as immediate access to imaging or surgical ICUs is limited. Laboratory Risk Indicator for Necrotizing

e-ISSN: 3048-9814 (Online)
Vol. 2 No. 3 (2025)
March 2025 Issue

Fasciitis (LRINEC) score may help but lacks sensitivity in some cases.

Literature Review

NF has been reported in a limited number of post-laparoscopic cases in India. A retrospective analysis by Mishra SP et al. (2016) noted a 28% mortality rate in 92 patients with NF, emphasizing early surgery as the most critical determinant. In Kumar A's 2019 report from Bihar, a similar post-laparoscopic NF case underscored the threat posed by delayed diagnosis and comorbid diabetes.

In Sharma H's 2018 review of diabetic NF in Eastern India, survival depended significantly on early recognition and multidisciplinary management. Our case adds to this growing yet underreported literature on surgical NF in India's rural belt.

Surgical Management: Early and aggressive surgical debridement remains the cornerstone of NF treatment. Hesitation or conservative approaches often worsen outcomes. Every delay increases the need for repeat surgeries, ICU time, and risk of systemic organ failure.

Role of VAC Therapy: Vacuum-assisted closure systems are beneficial in NF wounds by:

- Reducing edema and bacterial load
- Promoting granulation tissue formation
- Preparing wound for definitive closure

Although it is more expensive, using reusable VAC systems in Indian tertiary centers is leading to better results, even outside the main cities.

ICU and Multidisciplinary Care: To manage NF well, surgeons, intensivists, endocrinologists, microbiologists and nursing teams must cooperate. In this situation, getting the patient into the ICU quickly, using the right antibiotics, strict blood sugar control and good wound care were key to their recovery.

Prognosis and Follow-up: The patient is still doing well during all follow-up visits. Scars were barely noticeable and with endocrinology help, glucose levels improved. She was given a lot of advice about hygiene, caring for her wounds and making lifestyle changes.

Patient Consent: Informed written consent was taken from the patient before the publication of this case report and the use of associated clinical details.

Learning Points:

- Laparoscopic surgery does not protect against necrotizing fasciitis, so it should not be ignored.
- If the pain is much greater than the physical findings suggest, it should be checked immediately..
- Those who are diabetic or obese, as well as others at high risk, should be carefully watched after surgery.
- It is very important to remove infected tissues and give the right antibiotics early on for the patient to survive.
- Negative pressure wound therapy (VAC) is a useful way to treat large infected wounds.

e-ISSN: 3048-9814 (Online)
Vol. 2 No. 3 (2025)
March 2025 Issue

Working in rural or resource-poor areas demands that clinicians be more alert and make quick decisions.

CONCLUSION

If the condition not treated early, necrotizing fasciitis after laparoscopic cholecystectomy can be very dangerous and has a high mortality rate. It is specifically more important for surgeons to keep an eye over diabetics and obesity patients. This case depicts that, even with minimally invasive surgery, there is still a risk of deep-seated infections. In rural India, acting quickly, working together and applying VAC can greatly improve how patients heal.

REFERENCES

1. Mishra SP, et al. Necrotizing Soft Tissue Infections: A 5-Year Experience from a Tertiary Care Center in Northern India. Indian J Surg. 2016;78(4):297-302.
2. Kumar A, et al. Post-Laparoscopic Necrotizing Fasciitis: A Rare Case from Bihar. J Clin Diagn Res. 2019;13(6):PD03-PD04.
3. Sharma H. Necrotizing Fasciitis in Diabetics: Surgical Outcomes in Rural India. Indian J Case Rep Images. 2018;4(1):7-10.
4. Tiwari VK, et al. Early diagnosis of necrotizing fasciitis: Role of LRINEC score. Indian J Crit Care Med. 2013;17(5):308-310.
5. Ghosh S, et al. Vacuum-assisted closure therapy in surgical wound management. Indian J Plast Surg. 2009;42(2):193-202.
6. Yadav R, et al. Necrotizing Fasciitis: Risk Factors and Predictors of Mortality. Int Surg J. 2020;7(10):3401-3405.
7. Singh A, et al. Postoperative wound infections in laparoscopic surgeries: A clinical review. Indian J Surg. 2017;79(4):303-307.
8. Chaudhary L, et al. Managing surgical infections in rural tertiary hospitals: Challenges and strategies. Bihar J Surg. 2021;3(2):55-60.

Annexures

- Informed Consent Form (Form No-6 for Case Report/Case Series)
- Permission letter from Department of Surgery, Katihar Medical College