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Extensive Retroperitoneal and Extrasphincteric Spread of Complicated Fistula-in-Ano with Pelvic Emphysema: A Rare Case Report and Surgical Review

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ABSTRACT:

We report a rare case of a 68-year-old male presenting with fever, severe perianal pain, gluteal swelling, and systemic toxicity secondary to a complicated fistula-in-ano with extensive pelvic and retroperitoneal spread. Contrast-enhanced computed tomography revealed a large air-filled pelvic collection extending into bilateral inguinal canals, intermuscular planes, retroperitoneum, left obturator internus muscle, perinephric region, and base of penis through multiple intersphincteric tracts. Laboratory investigations showed severe leukocytosis, acute kidney injury, hypoalbuminemia, elevated procalcitonin, and multidrug-resistant *Escherichia coli* infection. Emergency incision and drainage of the ischiorectal abscess with laparoscopic loop sigmoid colostomy and extensive debridement was performed. The patient gradually improved with aggressive surgical management and culture-guided antibiotics. Early diagnosis, radiological assessment, prompt surgical drainage, and fecal diversion are essential in preventing mortality in advanced anorectal sepsis.

INTRODUCTION:

Fistula-in-ano is a common anorectal disorder resulting from cryptoglandular infection of the anal glands, as described by Parks, et al. [1]. Whiteford, et al. outlined the principles involved in the management of anorectal abscess and fistula disease [2]. Sahnian, et al. reported that delayed treatment of perianal abscess may progress to severe anorectal sepsis and systemic infection [3].

Malik and Nelson observed that a subset of fistulas may progress to complex supralelevator or extrasphincteric disease requiring advanced surgical management [4]. severe anorectal sepsis may spread through pelvic fascial planes and surrounding soft tissues, occasionally resulting in life-threatening complications

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We report a rare case of complicated fistula-in-ano with extensive retroperitoneal and extraperitoneal emphysematous spread managed successfully with emergency surgical intervention and fecal diversion.

CASE REPORT:

A 68-year-old male presented to the emergency department with complaints of fever, severe perianal pain, swelling over the left gluteal region, anorectal discomfort, generalized weakness, and inability to sit comfortably for several days. The patient also complained of decreased appetite and malaise. There was no history of inflammatory bowel disease or tuberculosis.

On arrival, the patient appeared toxic and dehydrated. His pulse rate was 112/minute, blood pressure was 160/80 mmHg, temperature was 102°F, and oxygen saturation was 91% on room air. Local examination revealed marked erythema, edema, induration, tenderness, and fluctuance over the left perianal and gluteal region suggestive of deep anorectal sepsis.

Initial laboratory investigations demonstrated severe systemic infection. Haemoglobin was 10 g/dl with persistent anemia during hospitalization. Total leukocyte count was markedly elevated, up to 17.5×1000/cumm, with neutrophilic predominance of 86%. Renal function tests showed acute kidney injury with serum urea 119.3 mg/dl and creatinine 2.57 mg/dl. Liver enzymes were elevated with SGOT 158.6 U/L and SGPT 98.5 U/L. Serum albumin was significantly reduced to 2.68 g/dl. Procalcitonin level was markedly elevated at 14.8 ng/ml, indicating severe bacterial sepsis. Serological investigations for hepatitis B, hepatitis C, and HIV were negative. (Table:1)

Table 1: Table of Lab investigations on admission

Investigation	Result	Reference Range	Interpretation
Hemoglobin	10.0 g/dL	13–17 g/dL	Anemia
Total Leukocyte Count	15.0 ×1000/cumm	4–10 ×1000/cumm	Leukocytosis
Neutrophils (Polymorphs)	86%	40–75%	Neutrophilia
Platelet Count	480 ×1000/cumm	150–400 ×1000/cumm	Thrombocytosis
Serum Urea	119.3 mg/dL	18–40 mg/dL	Acute kidney injury
Serum Creatinine	2.57 mg/dL	0.7–1.2 mg/dL	Renal dysfunction
SGOT/AST	158.6 U/L	5–35 U/L	Elevated
SGPT/ALT	98.5 U/L	5–35 U/L	Elevated
Alkaline Phosphatase	149 U/L	28–112 U/L	Elevated
Serum Albumin	2.68 g/dL	3.5–5.3 g/dL	Hypoalbuminemia
Procalcitonin	14.8 ng/mL	0.05–0.10 ng/mL	Severe bacterial sepsis
Serum Sodium	139.6 mEq/L	135–145 mEq/L	Normal
Serum Potassium	3.94 mEq/L	3.5–5.5 mEq/L	Normal
PT	17.4 sec	9.8–13.1 sec	Prolonged
APTT	41.7 sec	23.0–31.9 sec	Prolonged
INR	1.27	~1.0	Mildly elevated
HBsAg	Non-reactive	Non-reactive	Negative
HCV	Non-reactive	Non-reactive	Negative
HIV	Non-reactive	Non-reactive	Negative
Urine RBC	3–5 /HPF	0–2 /HPF	Microscopic hematuria
Urine Pus Cells	10–12 /HPF	0–5 /HPF	Pyuria
Blood Culture	No growth after 5 days	Sterile	Negative
Pus Culture	Growth of <i>Escherichia coli</i>	—	MDR organism isolated
Sensitive Antibiotics	Amikacin, Tigecycline	—	Sensitive
Resistant Antibiotics	Piperacillin/Tazobactam, Ceftriaxone, Cefepime, Imipenem, Ciprofloxacin	—	Multidrug resistance

SGOT-Serum Glutamic-Oxaloacetic Transaminase;

SGPT-Serum Glutamic Pyruvic Transaminase;

AST-Aspartate transferase; PT -Prothrombin time; INR -International normalized ratio

ALT-Alanine transaminase; APTT -Activated partial thromboplastin time;

HCV -Hepatitis C virus; HBsAg -Hepatitis B surface antigen; HIV-Human immunodeficiency virus; RBC- Red blood corpuscles;

U/L -Units/Liter, cumm-cubic millimetre; mg/dL-milligrams per deciliter; g/dL-grams per deciliter; ng/ml-Nanograms per milliliter; mEq/L-Milliequivalents per liter ; HPF-high-power field; sec-seconds.

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The patient was immediately resuscitated with intravenous fluids, oxygen supplementation, urinary catheterization, broad-spectrum antibiotics, and electrolyte correction. After detailed counselling and emergency surgery was planned.

Under anaesthesia, incision and drainage of the left ischioanal abscess was performed. A diamond-shaped incision was placed near the anal opening over the area of maximum fluctuance. Copious foul-smelling pus was drained, and extensive debridement of necrotic tissue was performed.

Pus culture from the abscess cavity revealed multidrug-resistant *Escherichia coli*. Sensitivity was noted to amikacin, tigecycline, gentamicin, and meropenem, and antibiotic therapy was adjusted accordingly.

Ultrasonography of the abdomen demonstrated extensive subcutaneous emphysema over the abdominal wall with inter-bowel fluid collection. CECT abdomen with rectal contrast revealed a large air-filled collection measuring approximately 52×172×150 mm involving the pelvis and extending into bilateral inguinal canals, pelvic soft tissues, and left obturator internus muscle with surrounding fat stranding and soft tissue thickening.

The contrast-filled fistulous tract extended from the anorectal region beneath the pelvic diaphragm along the prostate and anal canal from 1 o'clock to 6 o'clock position with intersphincteric communication into the anal lumen. Another intersphincteric tract extended between 7 o'clock and 10 o'clock positions. The tract further communicated with a left ischioanal abscess measuring approximately 28×22 mm, opening externally at the 5 o'clock position in the left gluteal region. An additional collection measuring 38×10×36 mm was identified at the dorsal aspect of the penile base extending into the corpora spongiosa. Extensive subcutaneous emphysema was seen involving the left anterolateral, lateral, and posterolateral abdominal wall with extension into intermuscular planes, (Fig:1) extraperitoneal spaces, retroperitoneum, and perinephric region. (Fig:2) Retroperitoneal air foci were identified along the psoas muscles. (Fig:3)

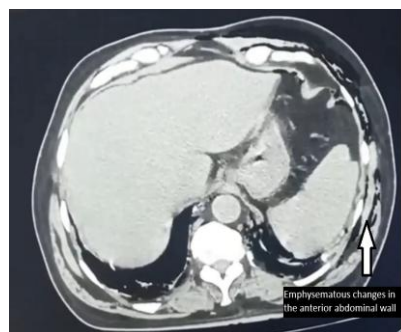


Fig:1.1 Emphysematous changes in the Anterior abdominal wall

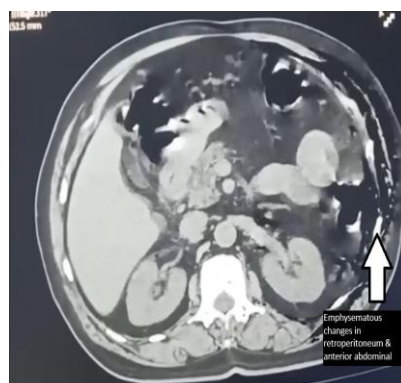


Fig:1.2 Emphysematous changes in Retroperitoneum and anterior abdominal wall

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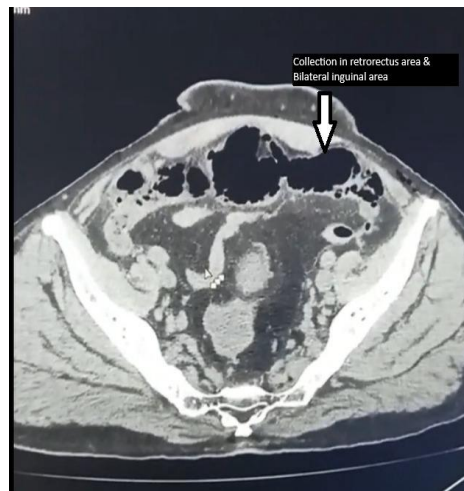


Fig:1.3 Collection in Retro recuts and Bilateral inguinal area

considering the extensive pelvic contamination and severe fistulous disease, laparoscopic loop sigmoid colostomy was performed for fecal diversion. Intraoperatively, retroperitoneal, retro rectus infected collections and extensive inflammatory changes were encountered. The descending colon was mobilized by incising the white line of Toldt. Blunt and sharp dissection of infected intermuscular and suprapubic planes was carried out with drainage of purulent and feculent collections. Drains were placed in dependent pelvic spaces.

Postoperatively, the patient was managed in intensive care with culture-guided intravenous antibiotics, nutritional supplementation, daily wound dressing, renal monitoring, and stoma care. Serial investigations demonstrated gradual improvement in leukocyte count and renal function parameters. Serum creatinine decreased from 2.57 mg/dl to 0.88 mg/dl during recovery.

The patient showed progressive clinical improvement with reduction in fever, pain, and systemic toxicity. Healthy granulation tissue developed over the wound site and the patient was discharged in stable condition with advice for regular follow-up and future definitive fistula management.

DISCUSSION:

Complex fistula-in-ano with extensive extrasphincteric and retroperitoneal spread is an uncommon but potentially life-threatening condition requiring prompt diagnosis and aggressive management. Garcia-Aguilar et al. reported that complex fistulas are associated with higher recurrence rates, extensive tissue destruction, and significant morbidity because infection may spread through deep pelvic fascial planes into adjacent compartments [5].

In the present case, the disease demonstrated unusual extension into the retroperitoneum, abdominal wall, bilateral inguinal regions, and perinephric spaces, accompanied by widespread soft tissue emphysema. Similar cases of retroperitoneal emphysema secondary to anorectal sepsis emphasized that the presence of retroperitoneal air usually indicates aggressive gas-forming infection with rapid fascial spread. Extension into the corpora spongiosa at the penile base further highlights the severity and invasive nature of the disease process.

Halligan and Stoker described the important role of cross-sectional imaging in fistula-in-ano demonstrated that MRI significantly improves preoperative assessment of fistulous tracts and occult collections [6]. In emergency settings, computed tomography remains particularly valuable for detecting retroperitoneal spread, soft tissue emphysema, and deep pelvic abscesses, thereby facilitating early surgical planning.

Anaya and Dellinger emphasized that successful treatment of necrotizing soft-tissue infections depends on prompt drainage, aggressive debridement, and effective source control [7]. Similarly, Eke reported increased mortality in patients with delayed diagnosis and inadequate treatment of severe perineal sepsis [8]. In our patient, repeated surgical debridement combined with broad-spectrum antibiotics and diversion colostomy resulted in effective infection control and gradual recovery.

The presence of multidrug-resistant *Escherichia coli* further complicated management. Sartelli et al. highlighted the growing challenge of antimicrobial resistance in complicated intra-abdominal and soft tissue infections,

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stressing the importance of culture-guided antibiotic therapy in severe sepsis [9]. Multidisciplinary management involving colorectal surgeons, radiologists, microbiologists, and critical care specialists was therefore essential in this case.

Although fecal diversion is not routinely required in standard fistula surgery, Ommer et al. suggested that temporary colostomy may be beneficial in patients with extensive perineal sepsis and large contaminated wounds [10]. In the present case, laparoscopic loop sigmoid colostomy minimized fecal contamination, promoted wound healing, and contributed significantly to overall recovery.

This case highlights the importance of maintaining a high index of suspicion in patients presenting with rapidly progressive anorectal sepsis and extensive subcutaneous emphysema. Early imaging, aggressive surgical intervention, appropriate antimicrobial therapy, and timely diversion procedures remain the cornerstone of management in preventing catastrophic complications and improving outcomes.

CONCLUSION:

Complicated fistula-in-ano with extensive extrasphincteric and retroperitoneal emphysematous spread is a rare but potentially life-threatening condition. Delayed diagnosis and inadequate treatment of complex anorectal sepsis can result in severe morbidity, progressive pelvic infection, and mortality. More recent studies on necrotizing anorectal infections further demonstrated that prompt radiological evaluation, aggressive drainage and debridement, fecal diversion when indicated, and culture-guided antimicrobial therapy are essential for successful management and improved survival outcomes.

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Conflict of Interest

None declared.

Ethical Approval

Not required.

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