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Necrotizing Pelvic Infection Following Rectal Resection: A Rare and Severe Postoperative Complication — A Case Report

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AUTHOR AND AFFILIATION

Abir El Hamzi¹, Karima Sif Nasr ¹, Omar Handi¹, Kassimi Chaimaa, Fatima Zahra Laamrani¹, Youssef Omor¹, Rachida latib¹ Sanaa Amalik¹

¹Oncology Radiology Department, Mohammed V University, Rabat, Morocco.

Corresponding author: Abir El Hamzi

ABSTRACT

Necrotizing pelvic infection (NPI) is a rare but life-threatening complication following rectal surgery, characterized by rapidly progressive infection along the deep pelvic and perineal fascial planes. It may result from various conditions, including anorectal infections, malignancy, inflammatory bowel disease, or colorectal anastomotic leakage. We report a case of extensive postoperative NPI in a 57-year-old woman following rectal resection for moderately differentiated infiltrating rectal adenocarcinoma. CT played a key role in establishing the diagnosis and accurately delineating the extent of the infection. This case highlights the importance of early CT recognition of NPI, a rare complication requiring prompt management.

KEYWORDS

Necrotizing pelvic infection, CT scan, pelvic infection, postoperative complication

MAIN ARTICLE

Introduction:

Necrotizing pelvic infection (NPI) is a rare but severe postoperative complication characterized by rapidly progressive infection along the deep pelvic and perineal fascial planes. Although uncommon, it can lead to extensive tissue involvement and significant morbidity and mortality. Colorectal surgery, particularly rectal resection, may rarely be complicated by NPI, most notably in the setting of anastomotic leakage. Anastomotic leakage itself remains a major complication of colorectal resection, contributing to increased postoperative morbidity, mortality, and adverse oncological outcomes. Early recognition is therefore essential for appropriate management. Given the rarity of NPI, evidence regarding its optimal management remains limited, and treatment generally requires a multidisciplinary approach combining intensive care, antimicrobial therapy, and surgical or endoscopic intervention.

Case report:

A 57-year-old woman was referred to our institution with a recently diagnosed colorectal adenocarcinoma. She had no significant previous medical history. Colonoscopy performed for persistent right lower abdominal pain revealed an ulcerated, infiltrative and circumferential colorectal lesion. Histopathological examination demonstrated a moderately differentiated infiltrating adenocarcinoma.

The patient underwent elective colorectal resection with colorectal anastomosis. The immediate postoperative course was initially considered satisfactory. However, several days after surgery, she developed progressive fever, pelvic pain and deterioration of her general condition. Clinical examination revealed marked pelvic and perineal tenderness associated with inflammatory changes of the perineal soft tissues. Laboratory investigations showed an inflammatory syndrome, with elevated leukocyte count and C-reactive protein. Given the clinical suspicion of a postoperative pelvic complication, an urgent contrast-enhanced abdominopelvic CT scan was performed.

CT demonstrated extensive inflammatory infiltration of the pelvic and perineal soft tissues, with multiple gas locules within the involved tissues. The process predominantly involved the

bilateral ischiorectal and ischioanal fossae and extended through the perineal musculature (Figure 1).

Superiorly, the inflammatory changes extended to the perirectal tissues and rectal wall, with involvement of the intersphincteric space. Areas of heterogeneous and decreased enhancement of the rectal wall were observed, raising concern for associated ischemic or necrotic changes.

The colorectal anastomosis was identified and appeared patent. No definite extravasation of orally administered water-soluble contrast was demonstrated during the examination. A surgical drain was visualized in the pelvis, with its tip positioned close to the anastomotic region. A small amount of pelvic fluid was present in the pouch of Douglas. Postoperative intraperitoneal free air was also observed, without a large intraperitoneal collection.

The inflammatory process extended along the pelvic fascial planes, with marked involvement of the perirectal, ischiorectal and ischioanal spaces. The presence of extensive gas-containing inflammatory changes in the deep pelvic and perineal soft tissues, associated with fascial extension and suspected rectal wall involvement, was highly suggestive of necrotizing pelvic infection.

No focal hepatic lesion suspicious for metastatic disease was identified on the CT examination. There was no significant deep lymphadenopathy or suspicious osseous lesion. Small bilateral pleural effusions with adjacent passive basal atelectatic changes were also noted.

Based on the clinical and radiological findings, the patient was considered to have an extensive postoperative necrotizing pelvic infection. She was transferred for multidisciplinary management involving colorectal surgery, radiology, infectious diseases and intensive care specialists. Broad-spectrum intravenous antibiotic therapy was initiated, and urgent surgical evaluation was performed (Figure 3). Surgical drainage and debridement were considered according to the extent of the infection. Although CT imaging showed features suggestive of pelvic tissue necrosis, no macroscopically necrotic tissue was identified during surgical exploration.

Discussion:

Necrotizing pelvic infection (NPI) is an uncommon but potentially fatal complication that may occur after rectal surgery. Although it is most frequently associated with perianal or ischiorectal abscesses and anorectal procedures, several other etiologies have been reported, including rectal malignancy, inflammatory bowel disease, trauma, perforated diverticulitis, rectal biopsy, sphincter dilation, and colorectal anastomotic leakage (1).

NPI is characterized by a rapidly progressive bacterial infection spreading through the subcutaneous and deep pelvic fascial planes. The muscles are often initially spared. According to the anatomical pathways of the pelvic fascia, infection may extend from the rectum to the presacral, retrovesical, perirectal, and retroperitoneal spaces, and may also spread superiorly along Scarpa's fascia toward the anterior abdominal wall. (2)

Clinical manifestations are often nonspecific during the early stages. Patients may present with pain, fever, malaise, and progressive deterioration of their general condition. When the infection spreads deeply while the overlying skin remains initially intact, sensory disturbances such as paresthesia may occur. As the disease progresses, cutaneous necrosis, crepitus, characteristic malodor, and septic shock may develop, potentially leading rapidly to multiorgan failure (3)

Given its rapid progression and high mortality in the absence of prompt treatment, early clinical recognition and imaging assessment are essential. CT plays a particularly important role in identifying gas within the soft tissues, defining the extent of fascial involvement, detecting associated pelvic complications, and guiding urgent surgical management.

The diagnostic assessment relies on a combination of clinical examination, laboratory tests, imaging, and endoscopic evaluation. Initial laboratory investigations include a complete blood count, C-reactive protein, and procalcitonin to assess the inflammatory and infectious response. Contrast-enhanced CT with a water-soluble contrast enema is the key imaging modality for suspected colorectal anastomotic leakage, allowing assessment of the leak site, its extent, the associated cavity, and any intra-abdominal collections or peritonitis. Digital rectal examination may provide additional information and can be followed by endoscopic assessment, which allows direct visualization of the anastomosis, precise localization and characterization of the defect, evaluation of the leak cavity, and assessment of bowel viability.

Necrotizing pelvic infections are typically polymicrobial, involving combinations of streptococci, *Staphylococcus aureus*, enteric Gram-negative bacteria, and anaerobes such as *Bacteroides* species (1).

Management of necrotizing pelvic infection requires early multidisciplinary and intensive care management. Initial treatment consists of broad-spectrum intravenous antibiotics, hemodynamic support, fluid resuscitation, and nutritional support, with inotropic agents when required. Hyperbaric oxygen therapy may be considered in selected patients when available.

Surgical intervention is indicated mainly in patients with uncontrolled sepsis, frank purulent or fecal peritonitis, or hemodynamic instability. Depending on the extent and location of the infection, procedures range from drainage and lavage with diverting loop ileostomy to resection of the failed anastomosis, closure of the rectal stump, and terminal colostomy.

In patients with a contained pelvic leak, previous diverting stoma, or no clinical evidence of generalized peritonitis, reoperation may be avoided. Minimally invasive approaches can then be considered, including transanal or percutaneous drainage, endoscopic vacuum-assisted closure (EVAC), endoscopic stenting, or clipping. The therapeutic strategy should be individualized according to the patient's clinical status, the location and extent of the infection, and the presence or absence of generalized peritonitis (4).

Conclusion:

Necrotizing pelvic infection is a rare but life-threatening complication following colorectal surgery. Its nonspecific initial presentation can delay diagnosis, making a high index of suspicion essential. CT is the key imaging modality, allowing early detection of gas-containing pelvic collections, assessment of fascial extension, identification of anastomotic complications, and evaluation of disease severity. Prompt diagnosis and multidisciplinary management combining antibiotics, drainage, endoscopic and/or surgical treatment are essential to control sepsis and improve outcomes.

FIGURES



Figure 1 : Axial abdominopelvic CT scan without intravenous contrast after administration of Gastrografin®, showing extensive phlegmonous and gas-containing infiltration of the pelvic and perineal soft tissues, involving the bilateral ischiorectal and ischioanal spaces, with extension to the perineal musculature, rectal wall, and intersphincteric space. No extravasation of Gastrografin® is identified at the colorectal anastomosis.



Figure 2. Coronal abdominopelvic CT reconstruction after administration of Gastrografin®, demonstrating opacification of the colorectal anastomosis (red arrow) without evidence of extraluminal contrast extravasation, indicating no radiological evidence of anastomotic leakage.



Figure 3. Intraoperative view showing extensive inflammatory changes involving the pelvic tissues and adjacent bowel loops, consistent with the severe pelvic infectious process demonstrated on CT.

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