International Surgery Journal
Shehri FA et al. Int Surg J. 2026 Oct;13(10):2016-2019
https://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20263363

Case Report

Leukemic infiltration mimicking an infected anal fissure in primary refractory acute myeloid leukaemia: challenging the role of surgery in neutropenic patients

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Received: 09 August 2026
Accepted: 11 September 2026

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ABSTRACT

The management of persistent anorectal disease in neutropenic patients with acute myeloid leukaemia (AML) remains controversial because operative intervention has traditionally been discouraged owing to concerns regarding bleeding, impaired wound healing, and septic complications. Although conservative management is recommended as the initial treatment strategy, the optimal approach for patients with persistent symptoms remains uncertain. We report the case of a 20-year-old woman with primary refractory AML who developed severe anorectal pain during prolonged febrile neutropenia despite broad-spectrum antimicrobial therapy and comprehensive conservative management. Pelvic magnetic resonance imaging demonstrated an active sinus tract without a drainable abscess. Following multidisciplinary assessment, examination under anaesthesia with fissurectomy was performed. Histopathological examination confirmed leukemic infiltration of the anal fissure, with blast cells positive for myeloperoxidase and CD68, establishing the definitive diagnosis. The patient experienced marked postoperative improvement in anorectal pain. This case supports an individualised multidisciplinary approach in which failure of optimised conservative management should prompt careful reassessment with appropriate imaging rather than automatic exclusion of surgery. In carefully selected patients, operative intervention may provide both definitive diagnosis and meaningful symptomatic benefit.

Keywords: Acute myeloid leukaemia, Neutropenia, Anal fissure, Leukemic infiltration, Fissurectomy, Multidisciplinary management

INTRODUCTION

The management of anorectal disease in neutropenic patients with acute myeloid leukemia (AML) remains controversial. Owing to profound neutropenia, thrombocytopenia, and impaired host immunity, operative intervention has traditionally been avoided because of concerns regarding bleeding, delayed wound healing, secondary infection, and septic complications. Consequently, current practice favors prompt initiation of broad-spectrum antimicrobial therapy, supportive care, and close clinical observation as the initial management strategy. However, the available evidence remains limited, consisting predominantly of retrospective studies and case reports, and no universally accepted management algorithm has been established.[1-3]

Current evidence supports an individualized approach to management rather than considering surgery an absolute contraindication in all neutropenic patients. Although conservative treatment remains the preferred initial strategy, operative intervention may be appropriate in

carefully selected patients with persistent symptoms despite appropriate antimicrobial therapy, progressive cellulitis or sepsis, tissue necrosis, or other complications requiring definitive source control. Multidisciplinary decision-making involving hematology, colorectal surgery, infectious diseases, and anesthesia is recommended to balance the risks of surgery against the potential consequences of delaying intervention.[1,3]

In the present case, the patient continued to experience severe anorectal pain despite conservative management and broad-spectrum antimicrobial therapy. Given the persistence of symptoms, examination under anesthesia with fissurectomy was performed despite profound neutropenia. Histopathological examination unexpectedly demonstrated leukemic infiltration, with blastoid cells positive for myeloperoxidase (MPO) and CD68, confirming involvement by the patient's known AML rather than isolated inflammatory disease. This finding illustrates the diagnostic challenge of anorectal conditions in patients with leukemia, where clinical presentation may closely resemble benign anorectal conditions while the underlying pathology reflects leukemic involvement.[1,4]

Persistent or atypical anorectal presentation, or failure of conservative management, should prompt reconsideration of surgical intervention. Because anorectal examination may be limited in profoundly neutropenic patients and clinical findings are often nonspecific, imaging and histopathological evaluation may be required to establish the diagnosis in selected cases. In our patient, tissue obtained during fissurectomy provided the definitive diagnosis and demonstrated that leukemic infiltration contributed to the patient's symptoms, emphasizing the diagnostic value of operative tissue sampling when conservative management fails.[1]

Our case adds to the limited literature supporting selective operative intervention in neutropenic patients with persistent anorectal disease. Rather than advocating routine surgery, it demonstrates that operative management should not be regarded as an absolute contraindication when symptoms persist despite optimized medical therapy. In carefully selected patients, surgical intervention may provide both diagnostic and therapeutic benefit while facilitating subsequent management. These decisions should remain individualized and undertaken through multidisciplinary collaboration after careful assessment of the patient's overall clinical status and disease severity.[1,3]

CASE REPORT

In April 2025, a 20-year-old Yemeni female patient with acute myeloid leukemia (AML-M4) was referred to our center for management of persistent leukemia. She was diagnosed with AML in Yemen in May 2024 after presenting with constitutional symptoms of fever, bone pain, and arthralgia. Initial lab results noted significant leukocytosis (WBC 65×10⁹/l) and severe anemia (Hemoglobin 6.8 g/dl). Immunophenotyping was performed, and her results were positive for CD13, CD33, CD117, and CD45. She was treated with chemotherapy administered in Yemen with Cytarabine for a total of eight cycles, completed in February 2025.

She traveled to Saudi Arabia for additional treatment after the development of progressive generalized fatigue, poor appetite with worsening anorexia, and the development of generalized cephalalgia and right ear pain with the otitis media that was not relieved with oral amoxicillin-clavulanate. She was febrile at 38.6°C with a heart rate of 113 bpm and a blood pressure of 97/49. She was noted to have pallor, gingival hypertrophy and left flank tenderness. However, there were no significant enlargement of the liver and spleen, or lymphadenopathy. Laboratory results revealed leukocytosis with a WBC count of 66.8 x 10⁹/L, anemia (Hemoglobin 10.4 g/dl), thrombocytopenia (Platelets 46×10⁹/l), with positive and elevated C-reactive protein and peripheral blood with numerous blasts. Immunophenotyping by flow cytometry revealed approximately 85% myeloid blasts, which were positive for MPO, and partially positive for CD34, CD117, CD33, CD13, CD123, CD71, CD64, and CD9, which confirmed the diagnosis of AML.

While under the care of the hematology service, the patient was started on the 3+7 induction regimen that includes both the combination of cytarabine and idarubicin, along with intrathecal triple therapy, and was initiated on induction chemotherapy. Flow cytometry was performed again after induction and displayed primary refractory AML after induction with 37% of leukemic blasts remaining. Therapy was initiated with azacitidine and venetoclax. During this time, the patient developed a multitude of complications that included prolonged febrile neutropenia, invasive fungal sinusitis, requiring FESS, multiple thromboembolic events of the hepatic venous system, multidrug-resistant infection, and severe bone marrow failure requiring blood product support.

She was readmitted again on June 8, 2025, with high-risk febrile neutropenia, and after a week, developed painful defecation and difficulty in defecating, along with worsening perianal pain. She had no abdominal pain, and there was no rectal bleeding or discharge. On June 15 of the same year, a General Surgery consult was requested. At the time of the General Surgery consult, the patient had no fever and hemodynamically was stable. Pain was severe and limited the perianal exam but revealed tenderness to the 12-1 o'clock position and a fourth-degree hemorrhoid.

Targeted ultrasonography of the perianal region identified a small right-sided localized perianal fluid collection measuring 2.0×0.9×1.1 cm. Contrast-enhanced pelvic magnetic resonance imaging also demonstrated an active sinus tract at the 12–1 o'clock positions with no large perianal abscess. Conservative management included

warm sitz baths, topical lidocaine gel, anti-hemorrhoidal cream, stool softeners, and broad-spectrum antimicrobial therapy. However, the patient was still unresponsive to treatment, and the pain was described as debilitating, which limited clinical examination.

In the case of severe thrombocytopenia, generalized and limited immunosuppression, the known risk for treatment and no viable alternative, an integrated approach was opportunistically taken, and the patient was scheduled to have the examination under anesthesia. This occurred on the 17 June 2025 and was followed by fissurectomy for a clinically diagnosed infected anal fissure.

The gross pathological examination of the specimens revealed two small fragments from a fissurectomy measuring 0.9×0.5×0.4 cm and 0.4×0.4×0.3 cm. The epithelial lining was ulcerated and revealed a portion of the dermis which was highly vascular and congested with numerous perivascular blastoid cells with fine chromatin and open nuclei. Immunohistochemistry demonstrated that the blastoid cells were myeloperoxidase positive and had a faint expression of CD68. This confirmed the presence of acute myeloid leukemia in the anal fissure.

On post-operative days 3-5, she had bowel movements, her diet was increased, and surgical examinations indicated continued improvement and wound healing with no signs of infection. Although there was improvement of perianal pain after surgery, she continued to have recurrent fever related to her progressive resistant leukemia and a multidrug resistant infection of the blood.

DISCUSSION

Patients with acute myeloid leukaemia (AML) are particularly susceptible to anorectal disease because chemotherapy-induced mucosal injury, prolonged neutropenia, and impaired host immunity predispose them to severe anorectal infections and other anorectal complications. These conditions may progress rapidly and are associated with considerable morbidity and mortality if not recognized and treated promptly. Consequently, early diagnosis and prompt initiation of broad-spectrum antimicrobial therapy remain the cornerstone of management in neutropenic patients presenting with anorectal symptoms.[1-3]

Current evidence recommends conservative management as the initial approach for anorectal disease in neutropenic patients. Initial treatment includes broad-spectrum antimicrobial therapy with appropriate gram-negative and anaerobic coverage, supportive measures such as warm sitz baths, stool softeners, adequate analgesia, optimization of bowel habits, and close clinical observation.[1-3] Because of concerns regarding bleeding, impaired wound healing, bacteraemia, and septic complications in profoundly neutropenic and thrombocytopenic patients, surgery has traditionally been reserved for selected cases.[1,3]

Patients who fail to improve despite optimized conservative management require careful clinical reassessment. Persistent anorectal pain, fever, progressive local symptoms, or inability to perform an adequate physical examination should prompt further investigation rather than continuation of conservative therapy alone. Pelvic magnetic resonance imaging (MRI) is the preferred imaging modality because of its ability to identify occult abscesses, fistulous tracts, and deep anorectal sepsis that may not be clinically apparent on physical examination.[1,3] Imaging findings should be interpreted together with the patient's clinical response to determine the need for further intervention.

When symptoms persist despite appropriate medical therapy, management should be individualized through a multidisciplinary team (MDT) approach involving haematology, surgery, anaesthesiology, and, when appropriate, infectious diseases specialists.[1,3] The decision to proceed with surgery should not be based solely on the presence of neutropenia but should instead consider the patient's overall clinical condition, response to antimicrobial therapy, imaging findings, hematologic status, anaesthetic risk, and the anticipated benefits of intervention. As high-quality evidence remains limited and no universally accepted management algorithm exists, individualized risk-benefit assessment remains essential.[1,3]

Our patient followed this recommended management pathway. She initially presented with severe anal pain associated with fever and received broad-spectrum antimicrobial therapy together with comprehensive conservative treatment. Despite medical management, she continued to experience debilitating anorectal pain that significantly limited clinical examination. Pelvic MRI demonstrated an active sinus tract without a drainable abscess. Following multidisciplinary evaluation, examination under anaesthesia was undertaken to further investigate the source of her persistent symptoms. Fissurectomy was performed, while lateral internal sphincterotomy was intentionally avoided to minimize tissue dissection and operative trauma in the setting of profound neutropenia and thrombocytopenia. Histopathological examination unexpectedly demonstrated leukemic infiltration of the anal fissure, with blastoid cells positive for myeloperoxidase (MPO) and CD68, establishing the definitive diagnosis. Surgical intervention was also followed by marked improvement in the patient's anorectal pain. Similar to previously reported cases, the initial clinical presentation closely resembled a benign anorectal condition, emphasizing that leukemic infiltration should be considered in patients with AML who develop persistent or atypical anorectal symptoms that fail to respond to appropriate medical therapy.[1,3]

Our case does not advocate routine operative intervention in neutropenic patients, nor does it challenge the current recommendation that conservative management should

remain the first-line approach.[1-3] Rather, it demonstrates that avoiding surgery solely because of neutropenia should not be regarded as an absolute rule. Patients with persistent anorectal pain, fever, or failure of optimized conservative management should undergo careful reassessment with appropriate imaging and multidisciplinary discussion before management decisions are made. In carefully selected patients, operative intervention may provide both definitive histopathological diagnosis and meaningful symptomatic benefit. Therefore, management should be individualized and tailored according to the patient's clinical response, imaging findings, hematologic status, and multidisciplinary assessment rather than neutropenia alone.[1-5]

CONCLUSION

The management of persistent anorectal disease in neutropenic patients with acute myeloid leukaemia remains one of the most challenging clinical dilemmas in surgical and haematological practice. While conservative management should remain the cornerstone of initial treatment, failure of optimised medical therapy warrants timely reassessment with appropriate imaging and multidisciplinary evaluation rather than automatic exclusion of operative intervention. Our case demonstrates that, in carefully selected patients, surgery may provide both definitive histopathological diagnosis and meaningful symptomatic benefit, particularly when persistent symptoms raise concern for underlying pathology not evident on clinical assessment alone. Ultimately, treatment decisions should be individualised, balancing operative risks against the potential consequences of delayed diagnosis, with management guided by the patient's clinical course, imaging findings, haematological status, and multidisciplinary consensus rather than neutropenia alone.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Shehri FA, Khan A, Khan A, Abbas OS, Abualhassan M. Leukemic infiltration mimicking an infected anal fissure in primary refractory acute myeloid leukaemia: challenging the role of surgery in neutropenic patients. Int Surg J 2026;13:2016-9.