Journal of Surgical Radiology

Site: https://journalsurgrad.com/

ISSN Print 2156-213X| ISSN Online: 2156-4566 Volume: 05 Issue: 07 Open Access

Research Article

Early Intestinal Perforation Following First-Cycle ABVD Chemotherapy in Hodgkin Lymphoma With Histologically Confirmed Bowel Involvement: A Case Report

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Article History
Received: 07.09.2026
Revised: 25.09.2026
Accepted: 05.10.2026
Published: 27.10.2026

Citations:
Zaidi SMF, Ali R, Alam S, Khan A, Ali A, Khalid Z, Qamar SZ. Early intestinal perforation following first-cycle ABVD chemotherapy in Hodgkin lymphoma with histologically confirmed bowel involvement: a case report. J Surg Radiol, V5(7) 509-515

Abstract: ***Introduction:*** Gastrointestinal involvement is rare in Hodgkin lymphoma (HL) and perforation of the gastrointestinal tract (GIT) can be a life-threatening complication to watch for. Early systemic chemotherapy perforation is a particularly rare event. ***Case Presentation***: A 27-year-old male with a known diagnosis of classical hodgkin lympho presented to us with acute abdominal pain and generalized peritonitis shortly after his chemotherapy – ABVD (doxorubicin, bleomycin, vinblastine, dacarbazine) was done. A chest X-ray was taken that showed free sub-diaphragmatic air and a non-contrast computed tomography (CT) of the abdomen showed hydro-pneumoperitoneum, with asymmetry to the dilated small bowel loops, probably a distended small bowel with a lead point likely in the distended distal ileum and a bulky inguinal lymphadenopathy bilaterally, which showed the known distended inguinal lymphadenopathy. During the procedure of exploratory laparotomy, there was evidence of feotal contamination of the peritoneum, a perforation in a very thickened, indurated segment of the distal ileum and accompanying mesenteric inflammation. The afflicted part was excised and a double loop ileostomy created. A histopathological and immunohistochemical study of the resected bowel performed a study of the mesenteric lymph node revealed transmural involvement by classical Hodgkin lymphoma. Postoperatively, the patient had no significant complications except for a superficial surgical-site infection (SSI), which led to a slight extension of her hospital stay, and was discharged in stable condition, to be followed in the hematology-oncology clinic for the continuation of chemotherapy. ***Conclusion***: Intestinal perforation may occur early after initiation of chemotherapy in any patient with Hodgkin lymphoma, and should be considered in the differential diagnosis of acute abdomen. Adopting immediate imaging, making early surgical judgement and ensuring that the source is source controlled is life-saving, and the definitive algorithms allow for disease to be confirmed in the resected bowel via histopathological examination.

Keywords: Hodgkin lymphoma; ileal perforation; ABVD chemotherapy; gastrointestinal involvement; pneumoperitoneum; double-loop ileostomy; surgical-site infection.

INTRODUCTION

Hodgkin lymphomas (HL) are lymphoma of lymphoproliferative type that is mainly located in peripheral lymph nodes (1). The incidence of gastrointestinal primary lymphomas is estimated at 0.8-1.2 /100,000 persons /year (2) and is a much less common occurrence than gastrointestinal involvement in non-Hodgkin lymphoma (3). If gastrointestinal tract involves, patient may have epigastric pain, nausea, vomiting, lose of weight, gastrointestinal bleed, or perforation, rarely, (3).

Perforative lymphomas are a rare but well-known surgical emergency (5). Possible mechanisms are believed to be transmural infiltration by lymphomatoids cells weakening the bowel wall, necrosis of the bowel after cytotoxic treatment, abdominal wall ischemia, secondary infection and bowel damage from the treatment itself, shortly after chemotherapy is begun (4).

Classical Hodgkin lymphoma (cHL) is successfully treated with combination chemotherapy using the ABVD regimen (adriamycin, bleomycin, vinblastine, and dacarbazine) as the initial treatment, with long-term trial results demonstrating the efficacy of this treatment [6]. But sometimes intense destruction of the tumour after it has started this very aggressive cytotoxic therapy, can cause acute structural complications in the affected extranodal organs. Here, we report a case of classical Hodgkin lymphoma that developed in a patient diagnosed with classical Hodgkin lymphoma (cHL) who experienced acute ileal perforation within days of receiving his first cycle of ABVD chemotherapy.

Immediate laparotomy associated with segmental ileal resection and the creation of a double-loop ileostomy was necessary and the patient's subsequent recovery was uneventful, except for a mild superficial surgical-site infection, whereafter the bowel biopsy demonstrated involvement with Hodgkin lymphoma.

CASE PRESENTATION

Patient History

A 27-year-old man was brought in to the Emergency Department with classical Hodgkin's lymphoma diagnosed in the previous week, presenting with a 1-day history of sudden onset and extreme generalized abdominal pain, abdominal distention, relative constipation, projectile vomiting and low-grade fever. His symptoms started suddenly after his first course (seven cycles) of systemic chemotherapy – ABVD (doxorubicin, bleomycin, vinblastin and dacarbazine) – on August 1 2026. Abdominal pain was dull-aching, not radiating, gradually increased in severity over time, exacerbated by movement, and only briefly alleviated with intravenous analgesics. This was associated with 3 to 4 episodes of emesis each day which was foul smelling and was greenish/bilious with food debris and a subclinical grade fever with no rigors and chills. He had no significant past medical history and chemotherapy was started on the 1st August 2026, followed by a second dose on the 15th August 2026. He had a positive family history and his father had a malignancy of unknown origin.

Laboratory findings on admission were remarkable for microcytic anemia (hemoglobin 10.6 g/dL), severe neutropenic leukopenia (total leukocyte count (TLC) 0.7 × 10⁹/L) and likewise borderline low levels of platelet count (144 × 10⁹/L). The renal and liver functions were normal on the screening investigations. In-ward investigations showed an improvement in white cell count (3.3109/L) and platelets (230109/L). However, it was found that C-reactive protein was abnormally high (141.3mg/L) while sodium (124mEq/L) and magnesium (1.6mg/dL) were mildly low. On the differential diagnosis and with the knowledge of his underlying diagnosis of Hodgkin's lymphoma in addition to the commencement of chemotherapy treatment, gastrointestinal problems such as bowel perforation were deemed a high priority and the patient was evaluated urgently for intra-abdominal surgical emergency.

Editorial note: *Date & time of first ABVD cycle, and interval to first abdominal symptom to be confirmed by the clinical record and inserted here.*

Examination

On presentation patient was found to be acutely distressed and was lying in bed, looking irritable but was oriented in time, place and person. Cutaneous flushing was present. Vital signs showed he was tachycardic at 108 beats per minute, with a blood pressure of 112/75 mmHg and respiratory rate of 20 breaths per minute, a temperature of 98°F (36.7°C). A distended, generalized and diffusely tender abdomen with guarding, rigidity, rebound tenderness and reduced and sluggish bowel sounds was noted during the abdominal examination, consistent with generalized peritonitis.

Editorial note: *confirmed vital signs and other relevant examination findings should be inserted from the medical record.*

Investigations

The chest X-ray was taken as an initial investigation for suspected hollow viscus perforation in a 'no worse than erect' position. It showed itself free gas under the right hemidiaphragm which was indicative of pneumoperitoneum (Figure 1).

A "plain" (non-contrast) computed tomography (CT) scan of the entire abdomen was then taken. The following conclusions were drawn:

- Mild hydro-pneumoperitoneum is probably due to hollow-viscus perforation.
- Multiple, asymmetrically dilated small bowel loops – a possible lead at the distal ileum; one (jejunal) loop was approximately 4.3 cm in caliber.
- Several (small volume) subcentimeter-sized mesenteric lymph nodes, the largest being about 0.7 cm in short-axis diameter.
- The liver also is moderately enlarged (span ~18.5 cm), features diffuse attenuation, and does not show a focal mass/process or any intrahepatic or extrahepatic biliary dilatation, which are consistent with coexistent hepatic steatosis.
- Normal gall bladder, pancreas, spleen, adrenal glands, and kidneys – no masses, stones or swollen kidneys.
- Bilateral enlarged lymph nodes, largest of which in the right inguinal region was approximately 2.8 × 3.1 cm, and another right inguinal nodule measuring approximately 4.3 × 4.9cm, which are consistent with the known Hodgkin lymphoma of the patient.
- A small left hydrocele, normal lumber sacral spinous processes.

The overall picture is of hydro-pneumoperitoneum, small bowel dilatation probably due to a defect/perforation of the hollow viscus, and hydro-storatic lesion in the liver, with a bi-lateral enlarged lymphadenopathy in both inguinal and paraaortic lymph nodal areas, typical of already known Hodgkin's lymphomatosis. Given the imaging findings and generalized peritonitis, the patient was explored and surgery was offered in a timely fashion.

Operative Management

After initial resuscitation, and intravenous broad-spectrum antibiotic therapy administration, the patient underwent an emergency exploratory laparotomy for generalized peritonitis and pneumoperitoneum.

Feculent contamination of the peritoneum was found at laparotomy. A well-defined perforation was defined in a very thickened, indurated and edematous region of the distal ileum and surrounding dilated and matted small bowel loops (figure 2). In addition, there was associated mesenteric lymphadenopathy noted.

There was a diseased and perforated ileal segment which was resected. Primary anastomosis was not attempted (Figure 3) due to heavily contaminated operative field, recent chemotherapy and underlying hematological malignancy. The bowel segment and lymph nodes from mesentery were removed and sent for histopathological examination, and thorough peritoneal lavage was done.

Histopathological Findings

Gross examination of the resected segment showed a thickened and ulcerated segment of bowel at the site of perforation.

Infiltrate macrophages and lymphocytes were polomorphic and whether and how large atypical cells morphologically compatible with Hodgkin and Reed–Sternberg cells infiltrated the bowel wall transmurally was demonstrated by microscopic examination. This was also seen in the mesenteric lymph node.

Immunohistochemical examination demonstrated the following profile:

Marker	**Result**
CD30	Positive in large atypical cells
CD15	Positive
PAX5	Weak/dim positive
CD20	Negative
CD45 (LCA)	Negative in large atypical cells
CD3	Negative in large atypical cells; highlights reactive T-cell population
EBER (in situ hybridization)	Positive

There was a good correlation between morphological and immunohistochemical diagnose and the impression was the classical Hodgkin lymphoma of the ileum and regional mesenteric lymph node.

Postoperative Course

Patient's postoperative recovery was satisfactory overall. The ileostomy stayed live and working the whole time, with good return of stomal output and the abdominal drains were withdrawn step-wise as output stabilized out of the ileostomy. No serious complications have been reported after surgery, except for a superficial surgical-site infection (SSI) of the laparotomy wound with partial discharge of the wound (Figure 4). Conserved treatment with routine wound care, dressing and antimicrobial treatment was adequate and no re exploration or further surgical procedure was indicated. The only morbidity during this patient's post-operative course was this superficial SSI which led to an expanded hospital stay. The patient was discharged clinically stable, when the wound had become satisfactory and stoma function was good. Upon recovery from the acute surgical situation, he was referred back to the hematology-oncology team for continued ABVD chemotherapy for his underlying Hodgkin lymphoma.







DISCUSSION

This is a rare, clinically unusual complication of Hodgkin lymphoma, termed acute ileal perforation, which ensued in the initial phases of the systemic chemotherapy in the days following the first cycle of ABVD.

Gastrointestinal (GI) involvement in classical Hodggkin lymphoma (cHL) is rare, whereas gastrointestinal involvement by non-Hodgkin lymphoma (cNHL) is more common. Thus, gastrointestinal complications are not commonly expected, especially since abdominal signs and symptoms occur early after therapy initiation and may be mistaken for gastrointestinal side effects of chemotherapy, neutropenic enterocolitis or possibly an unrelated surgical etiology (7).

Free voicing may be related to a number of overlapping mechanisms in the bowel of lymphoma. This is especially true of direct transmural lymphomatous infiltration, which can rupture the bowel wall, as this infiltrative process was confirmed on histological examination in this case. Treatment results in tumour necrosis and rapid lysis of malignant lymphoid tissue following the first time of cytotoxic, may further compromise a wall already infiltrated and thickened by the disease leading to perforation at already established place of disease. Additionally, ischaemia, ulceration and secondary infection can be causes (8).

The close temporal proximity of the first course of ABVD with the subsequent ileal perforation may suggest a treatment-related mechanism in the present case on top of an underlying transmural bowel infiltration. The temporal association, however, does not prove causation, and if the excised segment of bowel contains a histopathologic diagnosis of Hodgkin lymphoma, then the disease itself is the key factor in the weakening of the bowel wall and perforation (5). Accordingly, the present case is more aptly classified as being a "first-cycle" chemotherapy-related event of early perforation in a histologically confirmed case of lymphomatous enteropathy than it is as a "pure" chemotherapy-related event.

The acute abdominal pain in a chemotherapy patient is a wide differential consisting of infection, ileus, mechanical obs, ischemia, enterocolitis vs neutropenias and gium perforation. If the CT is positive and the chest X-ray is erect, which demonstrates pneumoperitoneum, along with generalized peritonitis, surgery should be assessed urgently (9). Emergency exploration in this patient enabled accurate source control with resection of an ileal segment that was perforated and reconstruction of a double-barrel ileostomy in a very contaminated surgical field.

Histopathological evaluation of the resected colon and related mesenteric lymph node were crucial in the diagnosis of the underlying pathological process. Histological and immunophenotypical diagnosis of classical hdl in an intestinal specimen is unusual and underlines the importance of regularly taking into biopsy for such a routine, as well as taking into biopsy for the common indications of perforation and/or peritonitis, material from abnormality or from macroscopic thickening of the bowel and the lymphatic tissue.

Despite recent chemotherapy, the postoperative course was favorable, and the underlying malignancy was not a problem. The only observed postoperative complication was superficial surgical-site infection (S. SSI), which was treated conservatively, and was associated with a slight increase in hospital stay but otherwise had no impact on results. The patient was then referred back to hematology-oncology for the continuing administration of ABVD. This outcome underscores the critical role and need for multidisciplinary collaboration between the emergency/general surgery and hematology-oncology teams in the care of patients with lymphomas who present with an acute surgical complication during their lymphoma treatment.

CONCLUSION

Perforation of the ileum is an unusual but critical gastrointestinal problem seen in patients with Hodgkin lymphoma. This can happen early in chemotherapy as it did in this case, a few days after the first ABVD treatment, and can cause a diagnostic and therapeutic problem because the disruption may occur either as a result of lymphomatous involvement of the bowel wall or as a reaction to the bowel-wall changes induced by the chemotherapy. A high level of suspicion should be maintained when a patient with Hodgkin's develops any type of acute abdominal pain following chemotherapy. Prompt surgical intervention is always required, and definitive source control is also critical when there is perforation and generalized peritonitis. This case also highlights the role of histopathology evaluation of abnormal bowel removed during surgery and the need for a multi-disciplinary approach to coordinating the management of the case to ensure that recovery from the surgical emergency does not hinder further management by other specialties, in this instance, oncology.

Learning Points

- Gastrointestinal involvement (GIT) is rare but can be a serious problem in classical Hodgkin lymphoma (cHL), causing perforations.
- Consider bowel perforation among other treatment related gastrointestinal complications when acute abdominal pain or peritonitis ensues shortly after chemotherapy is started even first cycle.
- The occurrence of a chemotherapeutic agent and perforation in close temporal association does not mean that the chemotherapy was definitely the sole cause; histologically proven involvement of the bowel wall with lymphoma may predispose the bowel wall to perforation.
- Chest X-rays and CT of the abdomen are helpful in a timely diagnosis of pneumoperitoneum and in determining the severity of bowel dilation and nodal disease.
- Good source control in a deeply contaminated operative field will be attained by emergency surgical resection of the perforated segment and double-loop ileostomy.
- Histopathological and immunohistochemical evaluation of the abnormal bowel and lymph nodes removed is crucial for confirming the underlying pathology.
- Demanding coordination between surgical and hematology-oncology teams is required in the post-surgical setting, and to ensure the continuity of the treatment for lymphoma.
- In this group, the only post-operative morbidity was superficial surgical-site infection which was treated conservatively, and this prolonged hospital stay accounted for a relatively minor proportion.

Declarations

Patient Consent

The patient was informed of this case study, clinical information and associated images, and gave written consent to participate in publication.

Ethics Approval

Because of the institutional guidelines, for this case report of a single patient there was no formal ethical approval required. Informed written consent for publication was obtained from patient.

Conflict of Interest

The authors state there are no conflicts of interest to disclose.

Funding

This case report was not prepared or published with any external funding.

Authors' Contributions

All of the authors were involved in the clinical evaluation, patient data information, literature review and preparation of the manuscript in accordance with

their role. There were no conflicts of interest regarding the manuscript that required this to be done.

Data Availability

This case report includes the clinical findings and pertinent information. Other patient information cannot be given out publicly to preserve patient confidentiality.

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