Case Report

DOI: 10.7860/JCDR/2026/82551.23239

Surgery Section

Oesophageal Perforation during Chemoradiation for Ewing's Sarcoma: A Case Report

VK GOPI[1], KT MURALIKRISHNAN[2], NAFIYA[3], A RAHUL DEV[4], BINI B NAMBIAR[5]

ABSTRACT

Oesophageal Perforation (EP) is a rare condition, mostly iatrogenic, commonly caused by endoscopic procedures. Non-iatrogenic EP associated with chemoradiotherapy for non-oesophagal malignancies is exceedingly rare. We report a case of oesophageal perforation in an eight-year-old girl undergoing adjuvant chemoradiotherapy for posterior fossa Ewing's sarcoma. During intensive chemotherapy, the patient developed acute chest pain, recurrent vomiting and abdominal pain. Diagnostic evaluation via gastrografin swallow X-ray confirmed an oesophageal perforation. The child was initially managed with a gastrostomy tube for enteral feeding, followed by posterolateral thoracotomy and repair of EP. The patient had an uneventful postoperative recovery. This case highlights the need for high clinical vigilance in paediatric oncology patients undergoing intensive chemotherapeutic regimens, where atypical presentations of gastrointestinal complications may arise. Early recognition and multidisciplinary interventions are essential to mitigate the risks of EP and optimise outcomes in this vulnerable population.

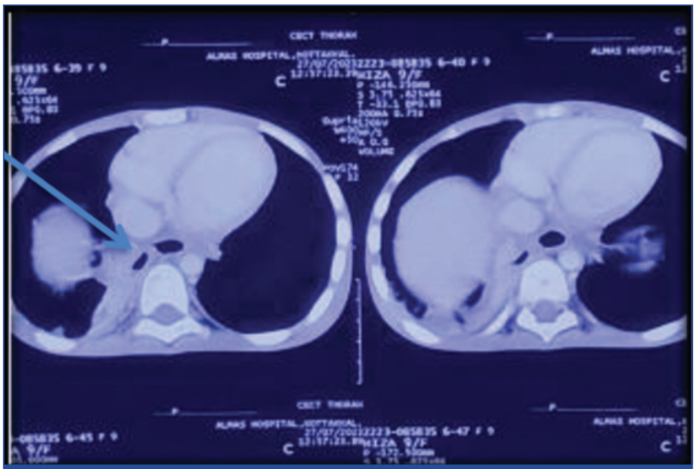
Keywords: Complications, Mucosal injury, Paediatric oncology, Surgical repair

CASE REPORT

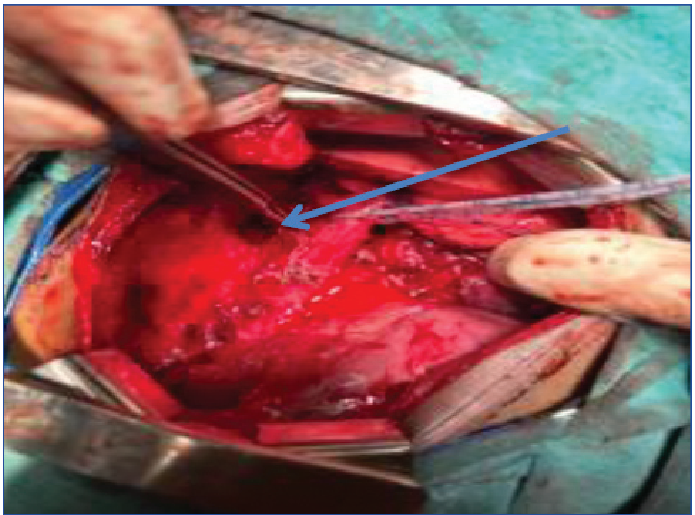
A female child aged eight years, firstborn of a full-term Lower Segment Caesarean Section (LSCS), with no significant perinatal events, fully vaccinated for age, with normal developmental milestones, presented to the department. Initially, she presented elsewhere with intermittent episodes of holocranial headache associated with non-bilious, non-projectile vomiting (2-3 episodes/day) of one week duration. She also complained of pain radiating to both upper arms, prompting an initial attribution to migraine due to a positive family history, and the child was started on medications for migraine. However, her symptoms persisted. An MRI of the brain was done, which showed large heterogeneous posterior fossa mass lesions with mixed solid and cystic portions. She underwent a Modified Lateral Supraorbital (MLSO) craniotomy with near-total excision of the tumour at the initial institution. Histopathological Examination (HPE) was suggestive of Ewing's sarcoma. Follow-up MRI scans after two months showed no residual lesions. The child subsequently received adjuvant radiotherapy using Image Guided Radiotherapy (IGRT) to a dose of 45 Gy in 25 fractions. Concurrently, adjuvant chemotherapy with the Vincristine, Actinomycin D/Doxorubicin, Cyclophosphamide/Ifosfamide, Etoposide (VAC/IE) regimen was also initiated. During chemotherapy, the patient became severely immunocompromised with a total leucocytic count of 100/microlitre and platelet count of 15000/microlitre and substantial weight loss. During her 45th week of adjuvant chemotherapy, two days after receiving Vincristine, Actinomycin and Cyclophosphamide, she developed recurrent vomiting, acute chest pain and abdominal pain. Barium swallow X-ray done at the referring centre revealed an oesophageal perforation, following which a feeding gastrostomy was placed. The child was subsequently transferred to our institution in a severely emaciated state. A repeat Gastrografin swallow X-ray confirmed oesophageal leak at the lower one-third [Table/Fig-1]. CT thorax + abdomen demonstrated EP with adjacent lung consolidation involving the right lower lobe [Table/Fig-2].

The child underwent posterolateral thoracotomy + oesophageal repair. Perforation of 1.5 cm in size was localised at the lower third of the oesophagus [Table/Fig-3]. The edges were freshened, the defect was closed with 4-0 Vicryl sutures, reinforced with a pleural patch. The postoperative period was uneventful. Gastrostomy feeding was resumed on POD-3. A repeat Gastrografin swallow on POD-5 showed no leak [Table/Fig-4] and oral feeds were restarted. The child was discharged on Day 7 with the gastrostomy tube in situ, which was subsequently removed. The follow-up evaluations were unremarkable.

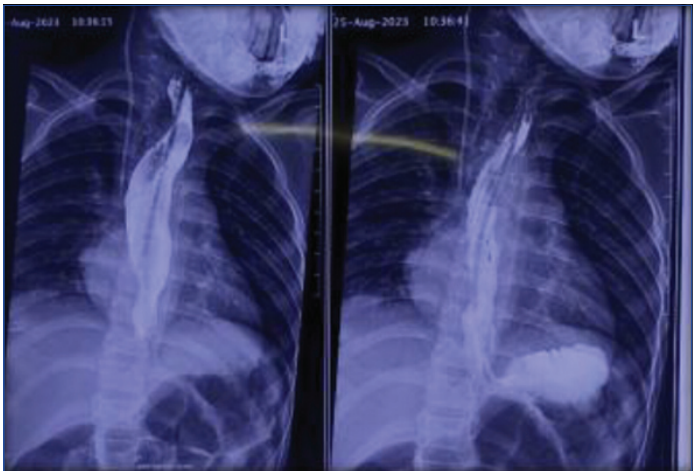
[Table/Fig-1]: Contrast swallow study: arrow shows contrast leakage in the lower third of the oesophagus.



[Table/Fig-2]: CECT thorax: arrow shows the extraluminal pouch in the right lower lateral oesophagus and adjacent lung consolidation (right lower lobe)-suggestive of Oesophageal Perforation (EP).



[Table/Fig-3]: Arrow shows the intraoperative findings of Oesophageal Perforation (EP).



[Table/Fig-4]: Post-repair contrast swallow study shows no leak.

DISCUSSION

The EP is a full-thickness injury to the oesophagus caused by various factors. The majority of them are iatrogenic, occurring during endoscopic or operative procedures. Other causes include spontaneous rupture (Boerhaave syndrome), trauma and foreign body impaction. EP complicates treatment and is frequently associated with considerable morbidity [1]. Instances of EP have been reported during or after radiotherapy for oesophageal cancers [2]. Chemotherapy-related gastrointestinal perforations, though infrequent, are documented, particularly involving the colon and small bowel in patients receiving agents such as Bevacizumab, Paclitaxel, and combination cytotoxic regimens [3,4]. However, EP secondary to chemoradiation therapy for non-oesophageal malignancies is extremely rare, especially in the paediatric population.

Potential mechanisms underlying oesophageal vulnerability in this case include chemoradiation-induced mucosal ulceration, compromised tissue repair and increased radiosensitisation of normal tissues [5]. The temporal link between the 45th VAC cycle and acute perforation suggests a multifactorial aetiology: direct mucosal toxicity from Cyclophosphamide's alkylating action and Actinomycin-D's inhibition of DNA-dependent RNA synthesis, compounded by Vincristine-induced vomiting and severe neutropenia, facilitating bacterial translocation and secondary infection [6]. Pre-existing emaciation and recurrent emesis may further exacerbate oesophageal fragility.

Clinically, EP presents with acute chest pain, dyspnoea, coughing on swallowing, fever and signs of sepsis. Nausea and vomiting, common during chemoradiotherapy, can exert stress on a weakened oesophagus, potentially contributing to tear formation [1].

Diagnostic confirmation relies on contrast Oesophagography (e.g., Gastrografin Swallow) to delineate leak location and extent, supplemented by CT to assess mediastinal extension and complications like lung consolidation [7]. Management strategies depend on the cause, size, and clinical condition of the patient. Small, contained perforations with minimal symptoms can be managed conservatively with i.v. antibiotics and nutritional support. However, surgical management is warranted in cases of large perforation, non-healing perforations, persistent leaks, mediastinal contamination, or clinical instability [8].

In our case, management with posterolateral thoracotomy and pleural patch reinforcement adhered to recommended guidelines for thoracic EP, resulting in leak resolution by the Postoperative Day 5 (POD 5). This outcome contrasts with the 15-20% failure rates commonly associated with diversion procedures such as oesophagectomy [9].

CONCLUSION(S)

This case highlights a rare instance of EP in a child receiving adjuvant chemotherapy and radiotherapy for a malignancy. Early recognition, appropriate imaging, and prompt surgical intervention were pivotal in achieving a favourable outcome. In this case, early initiation of gastrotomy feeding followed by elective definitive repair emphasised the importance of a tailored, multidisciplinary approach in managing such rare life-threatening complications.

REFERENCES

[1] Kassem MM, Wallen JM. Esophageal perforation and tears. [Updated 2024 Aug 19]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan.

[2] Lu KW, Wang TY, Chen PJ, Dai YH, Tsao CC. Esophageal perforation during neoadjuvant chemo radiotherapy for esophageal cancer following transcatheter arterial embolization: A case report. Ther Radiol Oncol 2021;5:4.

[3] Bhadbhade M, Connolly E, Badiani S, Yeo D, Bhadri V. Metastatic osteosarcoma bowel perforation secondary to chemotherapy-induced tumour necrosis. BMJ Case Rep. 2022;15(4):e247774. Doi: 10.1136/bcr-2021-247774. PMID: 35473702; PMCID: PMC9045112.

[4] Jayakody S, Wright DB, Chiong C, Liu M, Bouffler C, El-Khoury T. Rectal perforation following paclitaxel and carboplatin chemotherapy for advanced ovarian cancer: A case report and review of the literature. J Med Case Rep. 2018;12(1):221.

[5] Baker S, Fairchild A. Radiation-induced esophagitis in lung cancer. Lung Cancer (Auckl). 2016;7:119-27. Doi: 10.2147/LCTT.S96443.

[6] Katzka DA. Esophageal disorders caused by medications, trauma, and infection. In: Feldman M, Friedman LS, Brandt LJ, editors. Sleisenger and Fordtran's Gastrointestinal and Liver Disease. 10th ed. Philadelphia: Elsevier; 2015. p. 763-71.

[7] Govindarajan KK. Esophageal perforation in children: Etiology and management, with special reference to endoscopic esophageal perforation. Korean J Pediatr. 2018;61(6):175-79.

[8] Al Jubab A, Jafarlia IA, Al Tokhaisb T. Surgical versus non-surgical treatment for traumatic esophageal perforation in children: A systematic review. J Curr Surg. 2016;6(2):41-45.

[9] Shaqran TM, Engineer R, Abdalla EM, Alamoudi AA, Almahdi R, Aldhahri A, et al. The management of esophageal perforation: A systematic review. Cureus. 2024;16(7):e63651. Doi: 10.7759/cureus.63651.

PARTICULARS OF CONTRIBUTORS:

1. Senior Consultant, Department of Paediatric Surgery, Baby Memorial Hospital, Calicut, Kerala, India.
2. Senior Consultant, Department of Paediatric Surgery, Baby Memorial Hospital, Calicut, Kerala, India.
3. Medical Officer, Department of Paediatric Surgery, Baby Memorial Hospital, Calicut, Kerala, India.
4. Medical Officer, Department of Paediatric Surgery, Baby Memorial Hospital, Calicut, Kerala, India.
5. Senior Consultant, Department of Anaesthesiology, Baby Memorial Hospital, Calicut, Kerala, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Nafiya,
Seiken JJ Retreat, Pottammal, Calicut-673016, Kerala, India.
E-mail: nafiyaebrahim@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Sep 02, 2025
- Manual Googling: Feb 14, 2026
- iThenticate Software: Feb 16, 2026 (1%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Sep 01, 2025**
Date of Peer Review: **Dec 31, 2025**
Date of Acceptance: **Feb 18, 2026**
Date of Publishing: **May 01, 2026**