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A Rare Complication: Post-Chemotherapy Esophageal Stricture

Somnath Verma [a*], Bhavishya Sundar [a], P. Padmanabhan [a] and N. Dinakaran [a]

[a] Department of Medical Gastroenterology, Meenakshi Medical College Hospital and Research Institute, Kanchipuram, Kanchipuram, Tamil Nadu, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Dysphagia in patients undergoing cancer treatment is often associated with conditions such as reflux esophagitis, infectious esophagitis, malignant infiltration, or as a consequence of radiation therapy, the occurrence of an acute esophageal stricture resulting from chemotherapy is exceedingly rare. In this report, we present a distinctive case of an isolated chemotherapy-induced esophageal stricture in a patient who was undergoing treatment for metastatic osteosarcoma. Notably, this patient had no previous history of gastroesophageal reflux disease, caustic ingestion, or other risk factors commonly linked to the development of esophageal strictures.

Keywords: Post chemotherapy; oesophgaeal stricture; dysphagia; chemotherapy.

1. INTRODUCTION

Esophageal strictures are typically classified into two main categories: peptic and non peptic in their aetiology. Peptic strictures arise from prolonged gastroesophageal reflux disease. Non peptic strictures, on the other hand, have diverse causes, including infection, complications following surgery, tumour growth, exposure to toxic substances, or localized radiation exposure

[++] *Senior Resident;*
**Corresponding author: Email: vermasom743@gmail.com;*

[1]. The occurrence of esophageal stricture resulting from chemotherapy alone is an exceedingly rare phenomenon. As far as our knowledge extends, there have been only two reported cases in adult patients [2,3]. In the case of paediatric patients, it has been recognized as an infrequent complication following induction therapy for acute leukaemia [4,5,6].

2. CASE PRESENTATION

13 years aged boy was referred for evaluation of progressive dysphagia of 7 months duration. He was diagnosed with osteosarcoma, T1N0M0 of left knee 14 months earlier and started with neoadjuvant chemotherapy. Because of vomiting he was evaluated at 4th month of treatment and found to have mucositis, hepatitis, pancytopenia, COVID 19 positive serology. Chemotherapy stopped and he recovered with conservative management. He underwent above knee amputation a month earlier and referred for grade IV dysphagia. He had hair loss and discolouration of nails. Endoscopy showed narrowing at 25 cms of oesophagus (Fig. 1). Barium swallow also showed stricture of oesophagus and chest skiagram (Fig. 2) and CT Chest (Fig. 3) showed cystic lesions in the both lungs. He underwent graded oesophageal dilation with Savory – Gilliard dilators after discussion with parents (Fig. 4). His dysphagia was grade II with periodic dilation. Six months later he failed to follow up and died 1 month later.

3. DISCUSSION

Dysphasia in individuals with compromised immune systems is typically attributed to opportunistic infections, often caused by Candida albicans, herpes simplex virus, or cytomegalovirus. In both immunocompromised and immunocompetent individuals, dysphagia can also result from conditions such as reflux esophagitis, caustic ingestion, esophageal webs, and foreign body obstruction. However, the patient's medical history did not indicate any such factors contributing to his symptoms, and both endoscopic and histopathologic assessments ruled out these possibilities. While esophageal strictures are a recognized complication following radiation therapy, this patient had no prior history of such treatment. It is important to note that isolated chemotherapy-induced strictures are exceptionally rare.

Two extensive retrospective investigations examined the incidence of esophageal strictures in paediatric patients undergoing treatment for cancer. In both studies, all patients were subject to extended follow-up, which encompassed the assessment of delayed complications [4,7].

In the adult population, only two documented cases exist of patients developing esophageal stricture during systemic chemotherapy treatment [2,3]. Notably, in the majority of paediatric cases, including our own, symptoms manifested within three weeks of initiating systemic chemotherapy. Our patient underwent 5-fluorouracil (5-FU)-based chemotherapy, and their symptoms initially ameliorated following endoscopic dilation therapy [3]. Subsequent endoscopic examinations with multiple biopsies revealed no signs of esophageal malignancy, and cross-imaging confirmed a benign process. 5-FU-based chemotherapy functions by inhibiting

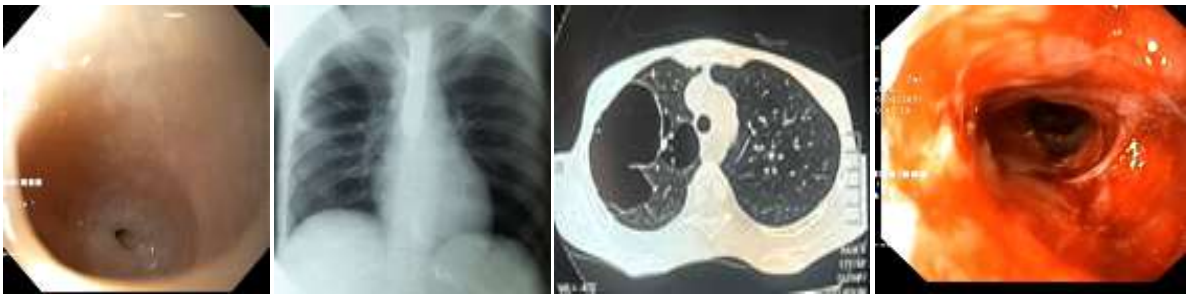

Fig. 1 **Fig. 2** **Fig. 3** **Fig. 4**

Fig. 1. Endoscopy showed narrowing at 25 cms of oesophagus
Fig. 2. Barium swallow showed stricture of oesophagus and chest skiagram
Fig. 3. CT of chest
Fig. 4. Graded oesophageal dilation with savory – Gilliard dilators

the S phase of the cell cycle, resulting in disruption of DNA replication and substantial mucosal damage across the gastrointestinal tract. Previous studies have also indicated that, in addition to 5-FU, both etoposide and cisplatin can intensify the radiation effects on the esophagus. Given our patient's lack of prior radiation therapy and the rarity of chemotherapy-induced strictures, it remains challenging to pinpoint the specific agent responsible for the adverse outcome.

Mucositis and esophagitis are recognized complications associated with various chemotherapy medications. However, the development of strictures is an exceedingly rare occurrence and has been scarcely documented in the existing literature. In this particular case, we suspect that the patient's esophageal stricture resulted from systemic chemotherapy since the patient had no history of long-term acid reflux or known exposure to established non peptic factors contributing to stricture formation. This unexpected adverse event is likely the result of a complex interplay between chemotherapy-induced mucosal damage and the rapid proliferation of cells lining the gastrointestinal tract. Remarkably, this condition presented with considerable severity, even in the absence of concurrent radiation-induced toxicity. These findings should serve as a catalyst for further investigation into the pathways of injury, potentially involved genetic mutations, and the risk factors of such a rare isolated injury.

4. CONCLUSION

In conclusion, the case presented here underscores the rarity and complexity of chemotherapy-induced esophageal strictures. While such strictures are exceptionally uncommon in the adult population, they have been more extensively documented in pediatric patients undergoing cancer treatment. In our case, the patient's medical history did not reveal any predisposing factors for esophageal stricture, such as prior radiation therapy or chronic acid reflux.

CONSENT

As per international standard or university standard, parents(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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