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Ileocolonic transposition in an HIV patient with an esophageal stricture: A case study

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Case Report

ABSTRACT

Esophageal strictures in patients with HIV (Human immunodeficiency virus) are poorly understood in terms of pathogenesis, prevalence, incidence, and surgical management. This case study is a 50-year-old man who has had trouble swallowing for ten months, which has left him unable to swallow for the past nine months. Clinical examination revealed thoracic esophageal constriction ranging from Vertebra thoracal (VTh) 4-5. Endoscopic findings revealed a convoluted, constricted lumen that impeded scope passage. A contrast-enhanced computed tomography (CT) scan on eight months ago revealed esophageal constriction, with suspicions of tuberculoma and fibrosis in the right upper lung. Reactive HIV results prompted anti-HIV therapy, supported by fine needle aspiration biopsy (FNAB) results, which demonstrated no evidence of malignancy but indicated granulomatous inflammation. Preoperative evaluations, including negative interferon-gamma release assay (IGRA) and sputum Acid-Fast Bacilli (AFB) tests, cleared the way for a three-hour ileocolonic transposition procedure. The procedure involved median and substernal incisions, dissection of the terminal ileum and the right colon as a graft, retrosternal tunnelling, and anastomosis with cervical oesophagus, which resulted in positive outcomes. A week later, the patient reported increased comfort, recovered eating and drinking abilities, and successful surgical incision healing. The ileocolonic transposition appears to be a potential therapeutic option. This safe and effective alternative not only addresses dysphagia but also improves the overall quality of life.

INTRODUCTION

Patients with esophageal strictures, which are defined as aberrant constriction of the esophagus lumen, frequently experience difficulties swallowing. When a stricture is formed, the esophagus loses its ability to stretch. These strictures might be isolated or diffuse over the esophagus, with sharp or tapered edges.[1] The incidence of esophageal strictures is about 1.1 per 10,000 person-years, and the condition tends to increase with age.[2]

Esophageal strictures have been associated with complications of ulcerative esophagitis in HIV-positive people.[3] Human immunodeficiency virus or AIDS infection can be associated with esophageal and cutaneous conditions. One major problem is opportunistic infections, such as candida esophagitis (a fungal infection), cytomegalovirus (CMV) and herpes simplex virus (HSV) esophagitis can harm the esophagus. It can also cause inflammatory conditions and an increased

risk of developing certain malignancies, including Kaposi's sarcoma.[4] Esophageal candidiasis (EC) is frequent in HIV-infected people, with 10-15% developing EC and 10% developing EC over their lifetime. However, the incidence of opportunistic infections in HIV-positive patients is decreased due to the effectiveness of highly active antiretroviral treatment (HAART).[5,6] Around 10% of HIV (Human Immunodeficiency Virus) patients develop idiopathic esophageal ulcers, either during acute retrovirus syndrome or in advanced HIV (CD4<50/uL) due to severe immunodeficiency.[7] A critical factor increasing the risk of infectious esophagitis in HIV patients recurs low CD4 counts, particularly patients with CD4 counts less than 100 cells/μL.[8,9] Patients with HIV-related ulcers often experience a sudden onset of severe odynophagia (pain when swallowing) and dysphagia (difficulty when swallowing). A characteristic maculopapular rash may arise on the upper body if ulcers form lesions during the earliest stages of HIV infection (seroconversion). Notably, treatment for HIV esophagitis differs from that for CMV esophagitis. HIV esophagitis typically requires oral corticosteroid therapy for over a month with antiretroviral therapy for HIV.[10]

Esophageal candidiasis is a common opportunistic infection among immunocompromised individuals, particularly those who are not being treated for HIV/AIDS or who have undergone an organ transplant and have reduced immune systems. Esophageal strictures can be caused by EC owing to persistent inflammation, tissue damage, fibrosis, and scar tissue formation, all of which restrict the esophagus. While mucosal inflammation is the major sign of esophageal candidiasis, severe instances can cause dysphagia, odynophagia, and weight loss.[11]

The literature on surgical treatments for esophageal strictures in AIDS patients is scarce. Few cases of transhiatal esophagectomy in adults and children have yielded excellent outcomes. Furthermore, a case report by Thakkar and Joshipira demonstrates that thoracoscopic esophagectomy with stomach tube passage for reconstruction is a viable and safe surgical alternative with favourable long-term outcomes.[3] The primary focus of this study is on how ileocolonic transposition can be implemented to treat esophageal strictures that worsen ulcerative esophagitis in HIV patients.

CASE DESCRIPTION

A 50-year-old male HIV patient complained of difficulty swallowing for ten months before being taken to the hospital. He had an immunochromatographic test (ICT) for HIV three years ago with positive results. As a result, he received anti-HIV medication. His condition worsened over the past nine months to the extent that he could no longer swallow. Radiologic imaging examination revealed narrowing of the oesophagus in the thoracic part, ranging from the level of corpus vertebrae thoracal (VTh 4 to VTh 5). Further endoscopic examination indicated a narrowed, tortuous lumen with an estimated diameter of 3-5 mm, hindering scope passage. A contrast-enhanced thoracic CT scan conducted eight months before surgery demonstrated the narrowing of the oesophagus in the same region, as well as suspicions of tuberculoma and fibrosis in the apex of the right upper lobe of the lung (Figure 1).

Three months later, a FNAB of the right lung revealed no malignancy but suspected granulomatous inflammation. The interferon-gamma release assay likewise returned negative results. Two months before surgery, he had another HIV test, which showed a safe titter in the flow cytometry analysis. The patient had a normal CD4 count (absolute lymphocyte count 1800/μL (normal range:1620-5370, flow cytometer), CD4% of 25.45% ((normal range: 35.30-61.10, flow cytometer), and an absolute CD4 count of 458/μL (normal range: 414-1679, flow cytometer). Preoperative examinations, including IGRA and sputum BTA tests, yielded negative results.

Following a 3-hour ilio-colon transposition, the surgical operation began with a median incision extending from the xiphoid process to the infraumbilical region. During the operation, the esophagogastric junction (EGJ) and the digestive system were exposed. A midline incision was then made on the left colon, parallel to the sternocleidomastoid line, followed by substernal tunnelling from the xiphoid area. The esophagus was located, and a retrosternal tunnelling procedure was performed. The esophagus was found, and a retrosternal tunnelling procedure was done in the left colon area, going through the xiphoid bone with blunt dissection. As the

surgery went on, the ascending ileocolonic graft was prepared. Its main blood supply came from the middle and left branches of the middle coronary artery. The marginal artery was preserved intact, whereas the right branch of the middle colic artery was severed. The graft was placed retrosternal, and the esophagus was anastomosed from side to side (Figure 2). After inserting and passing a nasogastric tube (NGT) to the distal side of the anastomosis, an end-to-side anastomosis was performed on the stomach. The patient had a 5-day post-operative care period. The patient received antibiotics, including ceftriaxone, paracetamol infusion, and omeprazole via parenteral route for three days, along with enteral nutrition through a nasogastric tube. One week after surgery, the patient reported feeling more comfortable and being able to eat and drink, and the surgical incision showed satisfactory healing (Figure 3).

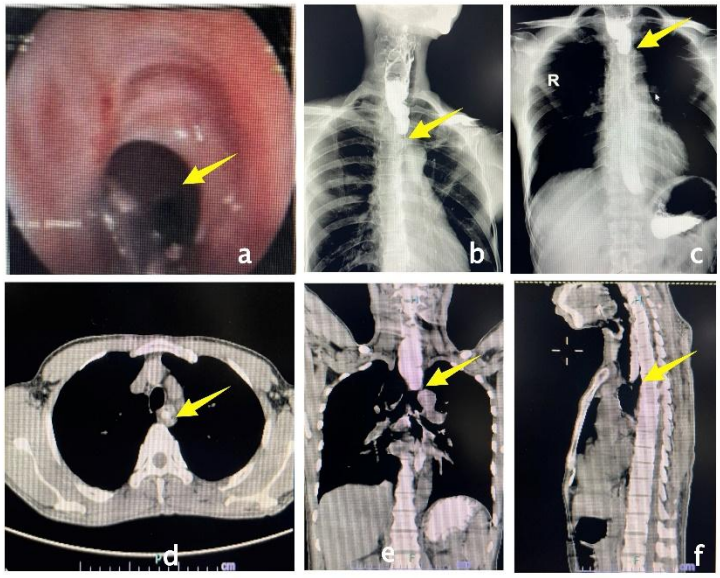

Figure 1. a. Endoscopic image of an esophageal stricture and mild esophagitis with a diameter of 2-3 mm, b-c Esophagography examination reveals a stricture at the level of the VTh 4-5, d. Coronal slice shows esophageal stricture, d. Sagittal section shows esophageal stricture at VTh 4-5, e. An axial picture of the esophageal stricture. MSCT (Multislice Computerized Tomography) scan offers a detailed axial picture of the esophageal stricture at the level of VTh 4–5.

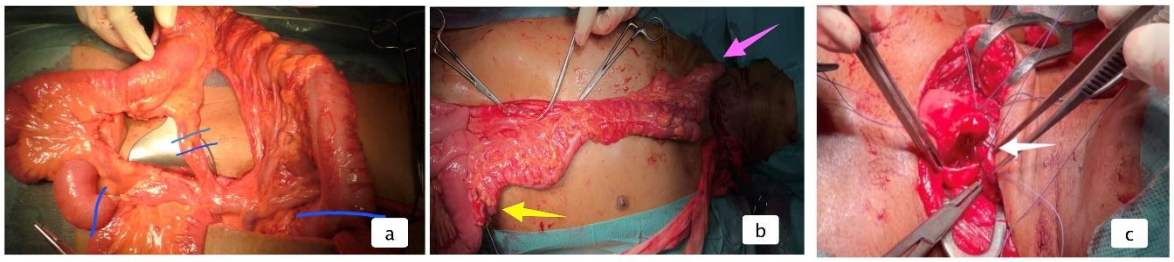

Figure 2. a. Preparing the ileocolonic graft while keeping the middle colic artery vascularized, b. The yellow arrow marks the end of the transverse colon, whereas the pink arrow denotes the end of the ileum, c. Anastomosis of the ileum and esophagus.

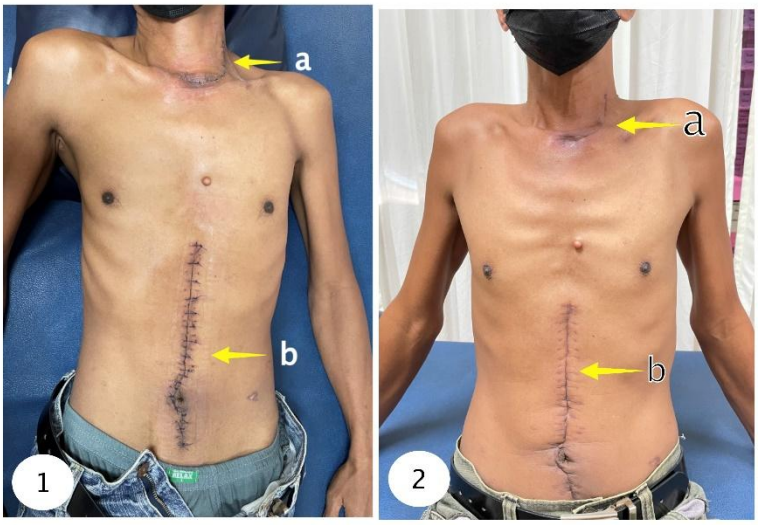

Figure 3. 1. Postoperative view of ileocolonic transposition 14 days after surgery, 2. (a) Cervical incision and (b) abdominal incision, 21 days post-surgery after suture removal.

DISCUSSION

HIV-associated esophageal strictures resulting from ulcerative esophagitis are uncommon. Esophageal stricture is a rare consequence of EC, an opportunistic infection that primarily affects people with low immune systems, especially those with HIV/AIDS.[11] Esophageal strictures occur in around 1.1 per 10,000 person-years for a number of reasons, and their condition tend to increase with age.[2] Upper gastrointestinal symptoms are prevalent in patients with HIV, even if they completely adhere to HAART. Many factors may contribute to this, including drug resistance and decreased drug absorption. One related condition is HIV esophagitis, an inflammatory and infectious condition. Opportunistic infections like candidiasis and other fungal diseases, as well as viruses such as CMV and herpes simplex virus, are common causes of HIV esophagitis.[12–14] In a sample of 160 HIV-infected patients with esophageal ulcers, 13 of them (8%) developed strictures. Five individuals tested positive for CMV, and one patient had both CMV and herpes simplex infection. The esophageal strictures likely resulted from oedema and inflammation due to CMV esophagitis, leading to fibrotic healing.[15] Typical symptoms of this condition include difficulty swallowing (dysphagia), nausea, acid reflux, heartburn, getting full quickly, and pain when swallowing (odynophagia).[12]

Three years ago, the patient in this case had an ICT test for HIV, which yielded positive findings. Three years later, he complained of swallowing problems for ten months before admitted to the hospital. The patient was diagnosed with esophageal stricture and treated as an HIV/AIDS patient. Esophageal strictures have been associated with complications of ulcerative esophagitis in HIV-positive people.[3] EC is common in HIV-infected patients, with 10-15% developing it during their lifetime. The EC can cause esophageal strictures by continuous inflammation, tissue damage, fibrosis, and scar tissue formation, as seen in this patient.[5]

Our patient is aging. Age of 50 years is a risk factor, as Takahashi et al. have observed in the past. They discovered that increased age, HIV infection, and EC are independently related with each other in their research. It has been demonstrated that HIV infection is a risk factor in the development of EC.[16]

Endoscopic examination might show vesicles and ulcers, while biopsies may reveal multinucleated giant cells.[17] Endoscopy of the upper region of the esophagus exhibits esophagitis and stricture in our patient. About 20% of people may naturally have an EC infection. Nonetheless, Candida albicans can proliferate and spread in the upper esophageal cortex due to immune system deficits and ulceration, resulting in yellow-white patches that are resistant to removal by upper endoscopy.[5] We recommend esophagoscopy for patients exhibiting early dysphagia symptoms if esophagitis is detected, as this condition may be associated with an esophageal stricture risk.

EC usually responds effectively to antifungal treatment. It is typically treated using a systemic rather than a topical approach. The most common treatment for EC is a systemic antifungal, such as oral fluconazole, fluconazole, itraconazole, or voriconazole. Amphotericin B deoxycholate can also be used to treat nonresponsive Candida esophagitis, though it has significant side effects that physicians should avoid.[5,6] A case study by Narang et al., highlights the successful management of chronic mucocutaneous candidiasis in a non-HIV patient; their patient was prescribed fluconazole and clotrimazole troches for oral candidiasis flare-ups, resulting in significant symptom improvement.[18]

In a study conducted by Shah et al, individuals with CMV esophageal stricture who were immunocompromised due to chronic alcoholism were treated with IV ganciclovir 5 mg/kg/dose every 12 hours for 7 days. Under fluoroscopic guidance, the patients in their study underwent serial dilation with SG dilators up to 14 mm.[15] Following that, the patient received oral valganciclovir at a dose of 450 mg twice daily for continuous treatment. The patient's dysphagia was successfully resolved after undergoing two additional endoscopic esophageal dilation procedures. Three months later, the patient was free from dysphagia.[15] Similarly to Shah's trial, a study by Tennant et al., involved a patient with immunocompromised due to the use of certain drugs for post-kidney transplant care. This patient received ganciclovir at an initial dose of 80 mg per day, which was then increased to 160 mg per day. The patient underwent repeated dilation with a bougie up to 39 French under fluoroscopic supervision and received oral valganciclovir 450 mg twice daily.[19] The patient's dysphagia resolved after undergoing three additional endoscopic esophageal dilation procedures. One year after treatment, the patient no longer had dysphagia but had difficulty losing weight.[19] Mansfield et al. also demonstrated that treatment with intravenous ganciclovir for 2 weeks along with esophageal dilation, has been shown to be a successful treatment for CMV esophageal stricture in HIV-positive patients.[8] However, since our patient had no history of oral candidiasis treatment, this approach could be considered as a protocol or guideline to prevent stricture if early signs and symptoms of esophagitis are detected. Standard esophageal stricture treatments, such as intraluminal dilatation, may not effectively address the unfavourable consequences experienced by all patients, particularly in cases of esophageal strictures in individuals with HIV. Recurrent scar formation occurs when fibroblasts multiply and produce collagen due to damage to the mucosal tissue.[20]

There is a limited amount of literature available on surgical techniques for treating esophageal strictures in HIV patients. Only a few case reports have been published discussing the use of transhiatal esophagectomy in both adults and children. Children infected with HIV who underwent transhiatal esophagectomy, esophageal substitution using a gastric tube, and laparoscopic transgastric resection with staple anastomosis to address esophageal stricture, had favorable outcomes. Transhiatal esophagectomy has been performed in HIV positive people with esophageal strictures and malignancies as a treatment for CMV infection.[3] Based on our experience with benign esophageal strictures, we have found that ileocolonic transposition can be a viable option for treating long and multiple esophageal strictures in HIV patients caused by esophagitis. This procedure is considered safe and may also help decrease acid reflux due to the presence of the ileocecal sphincter.

We conducted an ileocolonic transposition procedure without esophagectomy due to the patient's mild nutritional status, as shown by a subjective global assessment (SGA) score of B, which indicates that the patient is moderately malnourished or at risk of malnutrition, following preoperative optimization. This decision was made considering the patient's immunodeficiency resulting from HIV infection, which posed additional risks. Despite limited data, esophagectomy is increasingly being viewed as a viable option after optimizing the patient's nutritional state and administering HIV-AIDS medication. In addition to transhiatal esophagectomy, a case report conducted by Thakkar and Joshipira illustrates that thoracoscopic esophagectomy with gastric tube passage for reconstruction is a feasible and secure surgical alternative, with positive long-term results.[3]

This study focuses on how HIV-related esophageal strictures are treated, and ileocolonic transposition can be used to treat esophageal strictures that worsen ulcerative esophagitis in

AIDS patients. The favourable findings suggest that the ileocolonic transposition can be used as a treatment option. It provides a safe alternative that significantly improves the patient's quality of life by treating dysphagia; however, this procedure needs more research and consideration in clinical practice to fully understand its efficacy, applicability, and long-term outcomes in managing HIV-associated esophageal strictures.

CONCLUSION

The HIV-related esophageal strictures are rare and challenging to treat, and the ileocolonic transposition appears to be a potential therapeutic option. This safe and effective alternative not only addresses dysphagia but also improves the overall quality of life.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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DATA AVAILABILITY STATEMENT

The data supporting the findings of this study are available from the corresponding author upon reasonable request. Due to patient confidentiality and institutional ethical regulations, the clinical and imaging data that are not included in the published article are not publicly accessible.

SUPPLEMENTARY MATERIAL(S)

No supplementary materials are available for this study.

AUTHORS CONTRIBUTIONS

AYH conceived the study and approved the final draft. JA, NCJS, PDS collected data and drafted the manuscript. AFKA, YIBP, DA, BAMT critically revised the manuscript for important intellectual content. AYH, JA, NCJS, PDS, AFKA, YIBP, DA, BAMT facilitated all project-related tasks.

DECLARATION OF USING AI IN THE WRITING PROCESS

The authors utilized artificial intelligence (AI) tools, such as ChatGPT by OpenAI, to assist in language refinement, grammar checking, and improving the clarity of sentences during the writing process. All intellectual content, data interpretation, critical analysis, and final decisions were solely made by the authors. The use of AI did not replace any part of the authors' original contributions or critical thinking.

LIST OF ABBREVIATIONS

HIV: human immunodeficiency virus; CMV: Cytomegalovirus; HSV: Herpes Simplex Virus; HAART: Highly active antiretroviral therapy; VTh: vertebra thoracalis; FNAB: fine needle aspiration biopsy; IGRA: Interferon-Gamma Release Assay; ES: Esophageal stricture; ICT: immunochromatographic test; EC: Esophageal candidiasis; AIDS: Acquired Immunodeficiency Syndrome; CT scan: Computerized Tomography scan; AFB Acid-Fast Bacilli; EGJ: Esophagogastric Junction; NGT: Nasogastric Tube; MSCT: Multislice Computerized Tomography; SGA: Subjective Global Assessment.

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