



# Successful management of secondary aorto-enteric fistula: a case report from Nepal

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**Introduction:** Aorto-enteric fistulas (AEFs) are rare but serious causes of gastrointestinal bleeding, classified into primary and secondary types. This report describes the first documented case of a secondary AEF from Nepal, emphasizing the need for prompt diagnosis and surgical intervention.

**Case presentation:** A 36-year-old male presented with black tarry stools and abdominal pain, 7 years after aorto-right common femoral artery and aorto-left common iliac artery bypass surgery for common iliac artery occlusive disease. He had a history of recurrent graft infections. Examination revealed hypotension, tachycardia, and melena. Upper gastrointestinal endoscopy showed the aortic graft in the duodenum, with CECT confirming an aortic graft inside the bowel lumen, leading to a diagnosis of secondary aorto-enteric fistulas (SAEF).

**Discussion:** SAEFs often arise from graft infection and mechanical erosion by the pulsatile graft. Patients typically present with gastrointestinal bleeding, and early diagnosis is crucial, as untreated SAEFs have a mortality rate approaching 100%. The combined use of upper gastrointestinal endoscopy and CECT is essential for identifying and guiding the surgical intervention of SAEFs. This case underscores the importance of early diagnosis and early surgical intervention for successful management of SAEF.

**Conclusion:** This case highlights the importance of suspecting secondary AEFs in patients with aortic graft presenting with gastrointestinal bleeding. Early diagnosis and timely surgical intervention are essential for improving patient outcomes.

**Keywords:** aortic graft, aorto-enteric fistula, case-report

## Introduction

An aorto-enteric fistula (AEF) is a rare but gravid cause of gastrointestinal bleeding. Depending on whether a prior history of aortic surgery is present or absent, AEFs are categorized as secondary or primary AEFs.<sup>[1]</sup> Secondary AEFs can be further categorized into two types. One is Type 1 SAEF, which results in severe hemorrhage due to direct communication between the bowel and the aortic/graft lumen. Another one is Type 2 SAEF, also known as a “para-prosthetic enteric fistula” in which bleeding originates from the eroded bowel and allows communication between the peri-graft region and the bowel without direct luminal communication.<sup>[2,3]</sup>

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## HIGHLIGHTS

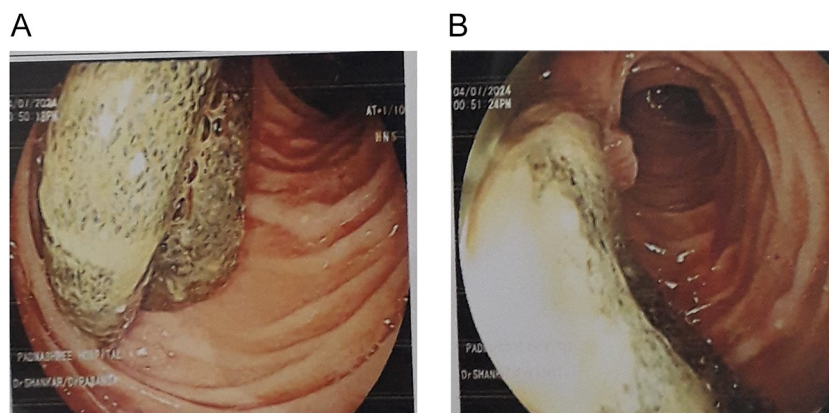
- Secondary Aorto-enteric fistula must be suspected if patient with aortic prosthesis presents with features of GI bleeding.
- Early diagnosis and surgical intervention are essential for SAEFs.
- Ongoing follow-up care for patients with aortic grafts to monitor for potential recurrent infection which can increase the risk of developing SAEFs.

Here, we describe a case with Type 2 SAEF, emphasizing the significance of prompt diagnosis and effective surgical treatment. To date, no similar case has been reported from Nepal. This case has been reported in line with SCARE 2023 criteria.<sup>[4]</sup>

## Case presentation

A 36-year-old male was admitted to our center with chief complaints of black tarry stool and abdominal pain. Seven years prior, he had undergone aorto-right common femoral artery and aorto-left common iliac artery bypass surgery for common iliac artery occlusive disease with penetrating atherosclerotic ulcer. He has multiple hospital admissions following bypass surgery due to graft infection, for which he received intravenous antibiotics. There was no medical history of hypertension, diabetes mellitus, kidney disease, and heart disease.

Upon physical examination, his blood pressure was 90/60 mm/Hg, his pulse rate was 100 beats per minute, and he was pale. His axillary temperature was 98 degrees Fahrenheit. There was a midline abdominal surgical scar. Mild tenderness



**Figure 1.** (A) UGI endoscopy revealed aortic graft inside the lumen of the duodenum. (B) UGI endoscopy revealed oozing of blood from eroded part of duodenum.

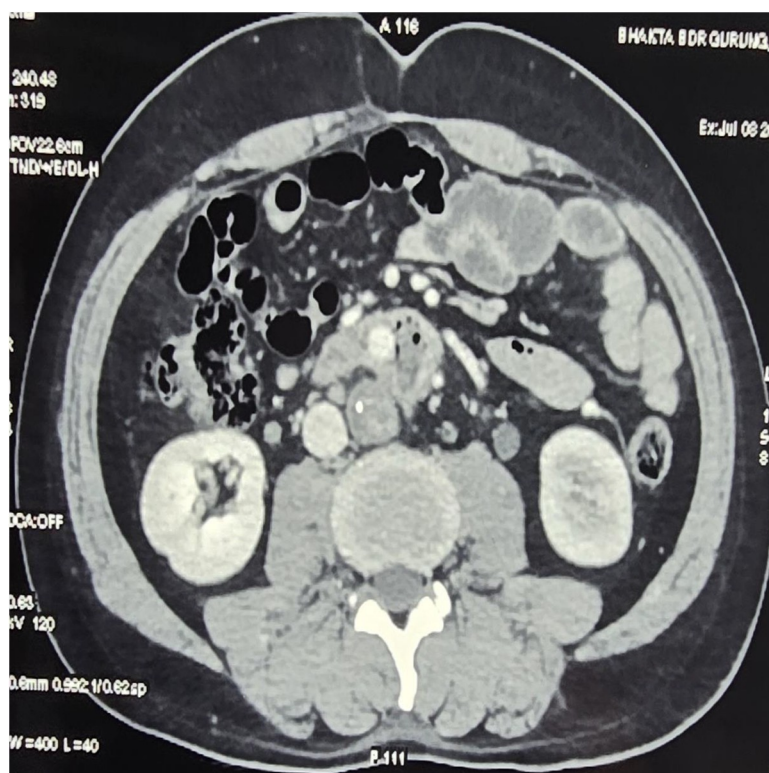
was present in the epigastric region. Digital rectal examination was suggestive of melena.

An upper gastrointestinal (UGI) endoscopy was performed to check for any UGI bleeding. UGI endoscopy showed an aortic graft in third part of the duodenum (Fig. 1A). Oozing of blood was seen from the eroded part of duodenum (Fig. 1B). An abdominal CECT was done which revealed an aortic graft inside the bowel lumen (Fig. 2). Based on these findings, diagnosis of type 2 SAEF (para-prosthetic enteric fistula) was made and surgery was planned with a combined approach from vascular-surgery and gastro-surgery teams.

During admission, hemoglobin was 6.9 g/dL. So, it was optimized by three units of packed red blood cells (PRBCs)

transfusion. Right axillary to right superficial femoral artery bypass and left axillary to left common femoral bypass surgery was done. This secured blood flow to lower limbs. A clamp was applied to infrarenal portion of the aorta. The third and fourth part of the duodenum along with proximal 10 cm of jejunum was resected and end-to-end duodenojejunostomy was done. The abdominal aorta was transected distal to the origin of renal artery. The proximal end of aorta was sutured and infected graft was explanted in pieces.

During hospital stay, the patient had no specific adverse events and was discharged on 7th post-operative day. The patient was followed up for next 3 months and there was no complaint suggestive of graft infection and GI bleeding.



**Figure 2.** Abdominal CECT of abdomen revealed an aortic graft inside the bowel lumen.

## Discussion

The exact mechanism of pathological development of secondary aorto-enteric fistula (SAEF) is unknown. There are two hypotheses that have been proposed to explain the mechanism. One is the mechanical erosion of prosthetic material into adjacent bowel due to continuous friction generated by pulsating graft. Another hypothesis is that graft infection may promote erosion of the adjacent bowel.<sup>[2,5]</sup> In our case, the patient had recurrent graft infection, which may have been a major contributing factor to the development of SAEF. The interval between initial operation and development of fistula ranges from weeks to years.<sup>[2]</sup> In this presented case, the patient developed an aorto-enteric fistula 7 years following bypass surgery.

The patient with SAEFs typically presents with signs of GI bleeding, which may be occult blood in stool or melena or hematochezia, or hematemesis.<sup>[2]</sup> The patient may also present with recurrent fever.<sup>[6,7]</sup> Few cases have been reported with SAEF presented with biliary vomiting or dyspepsia or abdominal pain.<sup>[8,9]</sup> Sometimes patients with SAEF may be even asymptomatic and incidentally diagnosed during regular health check-up.<sup>[3]</sup> Our patient presented with signs of GI bleeding, abdominal pain, and fever.

As the mortality rate of patients with SAEF without surgical intervention is 100 %, early diagnosis and surgical treatment is important.<sup>[10]</sup> Usually computed tomography (CT) and Upper GI endoscopy are used to diagnose SAEFs.<sup>[3,11]</sup> CT is imaging modality of choice for the evaluation of patients suspected for SAEFs in the emergency setting. The sensitivity of CT is as high as 90% for diagnosis of AEFs. CT features suggestive of SAEFs are ectopic gas, loss of the normal fat plane between the aorta and the adjacent bowel, extravasation of aortic contrast material into the enteric lumen, or leakage of enteric contrast material into the para-prosthetic space.<sup>[12]</sup> The diagnostic sensitivity of UGI endoscopy for SAEF is 24%.<sup>[2,11]</sup> Although the diagnostic sensitivity of UGI endoscopy for SAEF is low, UGI endoscopy is useful to rule out other causes of UGI bleeding. Endoscopic findings of secondary AEF include fistular openings, active bleeding, and prosthesis in the intestinal wall or crossing the intestinal lumen.<sup>[3]</sup> Although the sensitivity of CT is as high as 90% for diagnosis of AEFs, we first evaluated the patient through UGI endoscopy to look for any source of UGI bleeding. After UGI endoscopy revealed an aortic graft and oozing of blood from the eroded part of the duodenum, we sent CECT abdomen for further evaluation. CECT of the abdomen showed an aortic graft inside the bowel lumen. From these findings, a diagnosis of type 2 SAEF (para-prosthetic enteric fistula) was made.

Optimal surgical management of SAEFs should address both the aortic and bowel defects. The open surgical procedure allows simultaneous aortic and bowel defect repair.<sup>[13]</sup> In cases of an infected prosthesis, local reconstruction, extra-anatomic reconstruction before or after the excision of the aortic prosthesis, and excision of the aortic prosthesis, and in-situ placement of a new prosthesis/ cadaveric grafts have all been recommended. An extra- anatomic reconstruction with the excision of the infected prosthesis is usually performed when major infection is present.<sup>[10]</sup> As our patient had multiple hospital admissions for graft infection, we planned for extra-anatomic reconstruction through right axillary to right superficial femoral artery bypass

and left axillary to left common femoral bypass surgery and excision of prosthesis. The patient was followed up for next three months and there was no complaint suggestive of graft infection and GI bleed. We are planning to regularly follow up the patient to look for any graft infection and any GI bleeding.

## Conclusion

This case highlights the critical need to consider secondary AEFs in patients with aortic prostheses who present with signs and symptoms of gastrointestinal bleeding. Continuous follow-up care for aortic graft is essential to monitor for potential recurrence of infection, as graft infection increases the risk of SAEF formation. Timely diagnosis and effective surgical intervention are essential for improving patient outcomes.

## Ethical approval

Not applicable.

## Consent

Written informed consent was obtained from the patient for the publication of this case report and accompanying images. A copy of written consent is available for review by the Editor-In-Chief of this journal on request.

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## Author's contribution

Conceptualization: U.C. Patient Management: U.C., U.K.S., P. B.S.K. Writing – original Draft: K.M.P., U.C., K.K., B.G. Writing – review and editing: K.M.P., U.C., U.K.S., P.B.S.K., B.G. Visualization and Supervision: U.K.S., P.B.S.K. All authors have read and agreed to the final version of the manuscript.

## Conflicts of interest disclosure

None.

## Research registration unique identifying number (UIN)

Not applicable.

## Guarantor

Uttam Chaulagain.

## Provenance and peer review

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## Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## Assistance with the study

None.

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