



Case report

Left paraduodenal hernia containing three small bowel loops: A rare cause of closed loop obstruction - A case report

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ABSTRACT

Introduction and importance: Paraduodenal hernias (PDH) are the most common type of internal hernia, accounting for 53 % of cases, but remain a rare cause of intestinal obstruction overall. Left PDH, comprising about 75 % of all PDHs, can present with vague gastrointestinal symptoms or acute obstruction, with a high risk of strangulation and bowel ischemia. Early diagnosis and prompt surgical management are essential to reduce morbidity and mortality.

Case presentation: A 51-year-old male presented with abdominal distention, vague abdominal pain, bilious vomiting, and inability to pass stool or flatus. Contrast-enhanced computed tomography revealed a closed-loop obstruction due to a left PDH. Emergency laparotomy showed herniation of jejunal and ileal loops with a 3 cm segment of nonviable jejunum, which was resected. An end-to-end anastomosis and primary repair of the defect were performed. The postoperative course was uneventful, and the patient remained symptom-free at the six-month follow-up.

Clinical discussion: Left PDH arises from congenital defects in the mesocolon, typically through the fossa of Landzert. Diagnosis is challenging due to nonspecific symptoms, but can be accurately made with CT imaging. Surgical intervention—open or laparoscopic—is required due to the high risk of complications. The approach depends on clinical urgency and available expertise.

Conclusion: Left PDH, though rare, must be considered in cases of unexplained obstruction, especially in a virgin abdomen. Early CT diagnosis and prompt surgical intervention are vital to reducing morbidity and mortality. The surgical approach should be tailored to patient stability and available expertise.

1. Introduction

Internal hernias (IH) occurring through mesenteric or mesocolic defects are a rare entity with an incidence of less than 1 % and account for 5.8 % of all obstruction cases. IH can be classified as either congenital, which occurs through normal foramen, or abnormal anatomical defects, or acquired, which occurs secondary to previous abdominal surgery or trauma [1]. Paraduodenal hernia (PDH) is the most common form of internal hernia, with an incidence of 53 % of all internal hernias [2]. Left PDH, comprising approximately 75 %, occurs through the fossa of Landzert, and the remaining 25 % are right-sided PDH occurring through the fossa of Waldeyer's [3]. PDH may present

with nonspecific symptoms and signs ranging from vague epigastric discomfort to chronic postprandial pain. Acute episodes of intestinal obstruction may lead to bowel strangulation and ischemic events, whose lifetime risk is over 50 % [3,4]. With the high risk of bowel ischemia, contrast-enhanced computed tomography (CECT) is mandated, which is the imaging modality of choice. Once a diagnosis is confirmed, emergency surgical intervention is mandatory, given the mortality rate of 20–50 % for acute presentation [4]. This case report has been reported according to the revised SCARE guidelines, 2025 [5].

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2. Case presentation

A 51-year-old man presented to the emergency department with a 5-day history of abdominal distention and vague abdominal pain, accompanied by multiple episodes of bilious vomiting occurring 1–2 h after meals for 3 days and absence of stool or flatus for the same duration. His medical history was otherwise unremarkable. On physical examination, the patient had a BMI of 21 kg/m² and was tachycardic with a pulse rate of 108 beats per minute; the rest of the vitals were normal. Abdominal examination revealed epigastric distention and tenderness without guarding or rigidity. Bowel sounds were sluggish, and all hernial orifices were intact. The lab tests showed that the patient had a hemoglobin level of 11.8 g/dl, a total leukocyte count of 15,440/cumm (89 % neutrophils and 6 % lymphocytes), and urea levels of 45 mg/dl. The rest of the parameters were within the normal limits. An erect abdominal X-ray showed dilated jejunal loops but was otherwise nonspecific. A contrast-enhanced CT scan (CECT) of the abdomen demonstrated a closed-loop obstruction of the small bowel, with dilated proximal loops measuring up to 3.2 cm in diameter. The transition point was found in the upper left abdomen, where bowel loops were clustered in a sac-like space behind the stomach and to the side of the ligament of Treitz, indicating a left paraduodenal hernia (Figs. 1 and 2).

The patient was stabilized and resuscitated. A nasogastric tube was inserted, and an emergency exploratory laparotomy was performed through an upper midline incision. Intraoperatively, approximately 200 ml of the serosanguinous collection was present in the peritoneal cavity. The left paraduodenal hernia was located to the left of the 4th part of the duodenum and the duodenojejunal (DJ) flexure. Three segments of the small intestine were involved in the hernia: 30 cm of dilated jejunum, forming a closed-loop obstruction, and 150 cm of collapsed ileum (Fig. 3). The herniated bowel loops were carefully reduced. The defect was causing constriction of the jejunum, 160 cm distal to the DJ flexure, resulting in a 3 cm segment of nonviable jejunum, which was resected. An end-to-end isoperistaltic anastomosis was performed, and the defect was repaired with absorbable sutures (Fig. 4). Postoperatively, the patient was closely monitored. A liquid diet was initiated on the 2nd postoperative day (POD) and gradually increased on the 3rd POD. On the 4th POD, a soft diet was started. The abdominal drain was removed on the 5th POD, and the patient was discharged on the 7th POD. At the 2-week follow-up, the patient had no complaints, and the abdominal

wound was healing well. On subsequent follow-up visits at 1 month and 6 months, the patient remained symptom-free, with no signs of recurrence of the paraduodenal hernia. The patient expressed relief and gratitude for the timely diagnosis and surgical intervention, stating that he had endured vague abdominal discomfort for months without a clear explanation. He reported significant improvement in his quality of life and satisfaction with the outcome, particularly due to the resolution of symptoms and smooth postoperative recovery. The sequence of key clinical events is outlined in the following timeline (Table 1).

3. Discussion

Internal hernias are a rare cause of intestinal obstruction and occur when abdominal contents are trapped within a compartment of the abdominal cavity. PDH constitutes around 53 % of internal hernias and 5.8 % of all cases of small bowel obstruction [2,6]. They are more common in males (M: F = 3:1), age of onset between 40 and 60 years, and on the left side (left:right = 3:1) [2,7]. There are multiple theories regarding the formation of a paraduodenal hernia. The most widely accepted one was proposed by Andrews in 1923. He postulated that it results from an embryological error during the midgut rotation, with failure of the mesentery to fuse with the parietal peritoneum of the posterior abdominal wall after the return of the herniated intestinal loops to the abdominal cavity in the early weeks of development, creating a potential space of herniation behind the mesocolon [8]. The left PDH arises from the fossa of Landzert (present in 2 % of the population), through a defect in the left portion of the transverse mesocolon, causing retroperitoneal retrocolic herniation of the proximal small bowel. It is located to the left of the fourth part of the duodenum, posterior to the inferior mesenteric vein and left colic artery (ascending branch), where they form the free edge of the hernia, and directly below the posterior parietal peritoneum (Fig. 5) [9,10].

Clinical presentation of LPDH varies. It may be asymptomatic or may present with chronic mild non-specific abdominal symptoms (reported up to 69 %) such as abdominal fullness after a meal, nausea, vomiting, colicky abdominal pain, or features of acute small bowel obstruction (reported up to 66 %) [11]. The diagnosis of left PDH is extremely difficult as it presents with nonspecific signs and symptoms. Plain X-ray abdomen may demonstrate a circumscribed ovoid mass of small bowel loops occupying the left upper quadrant of the abdomen immediately

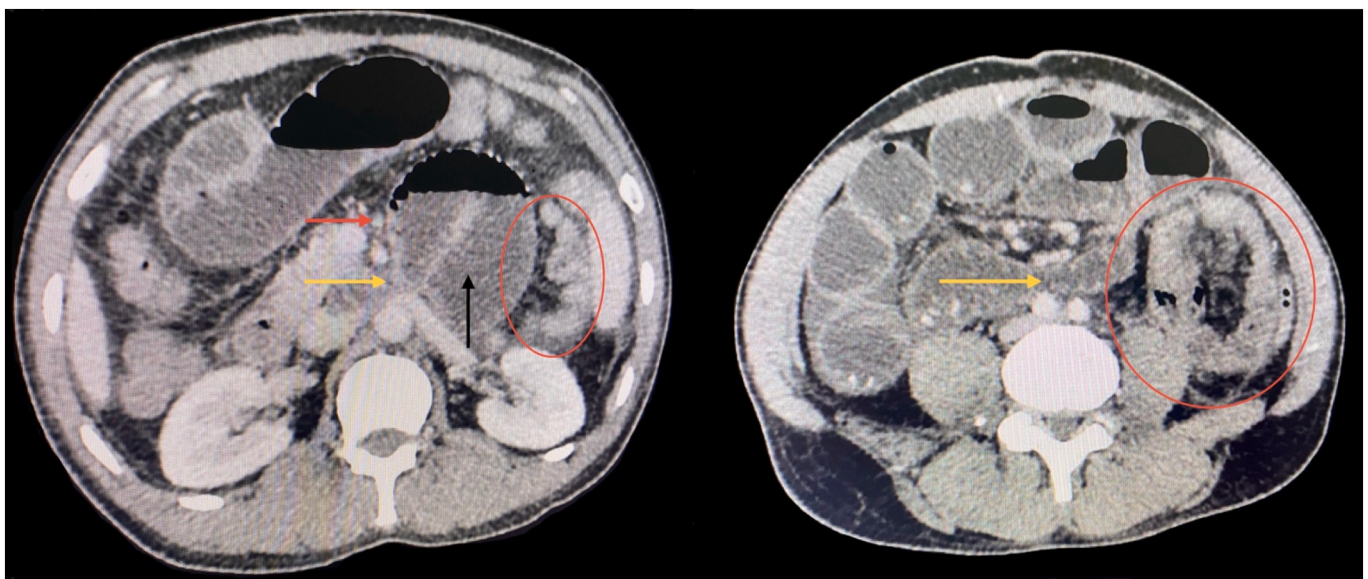


Fig. 1. CECT axial section showing red arrow indicates the inferior mesenteric vein lying anteromedial to hernial sac. Yellow arrow showing herniated bowel loops through the foramen of Landzert with dilated small bowel loops indicated by the black arrow. The red circle encloses the cluster of herniated small bowel loops in the left upper quadrant resembling encapsulation or sac-like appearance- characteristic of left paraduodenal hernia. CECT: Contrast-Enhanced Computed Tomography.

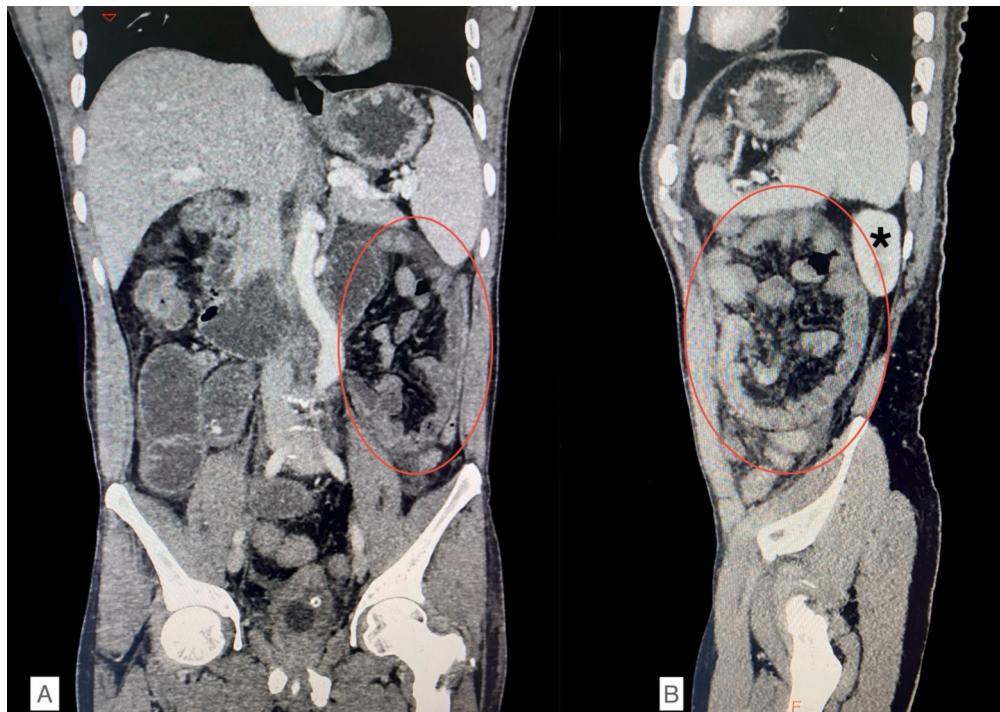


Fig. 2. CECT Coronal section (A) showing red circle showing clustered, nondilated small bowel loops entrapped in the left upper quadrant with encapsulated appearance typical of a hernia sac. CECT Sagittal section (B) red circle outlines clustered small bowel loops, appearing sac-like. Loops are seen occupying a space anterior to the left kidney (asterisk), consistent with the anatomical location of a left paraduodenal hernia sac. CECT: Contrast-Enhanced Computed Tomography.

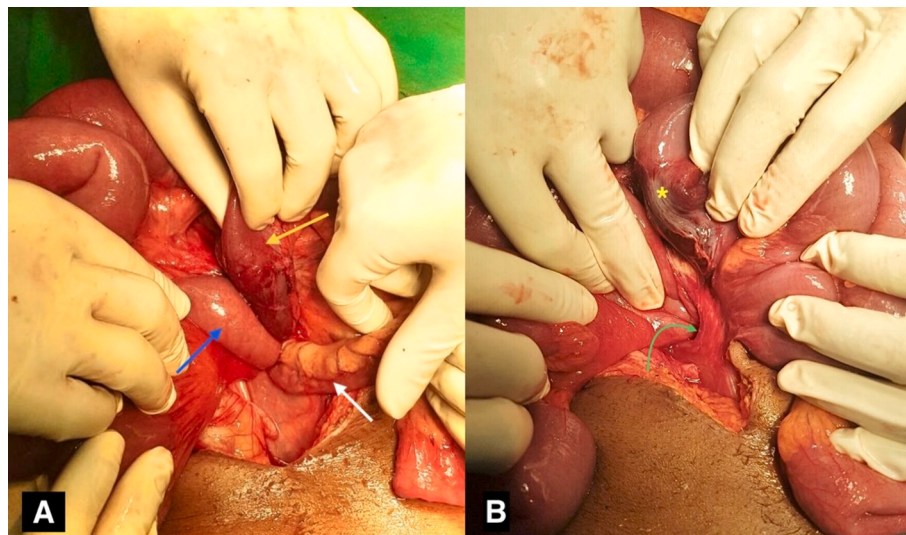


Fig. 3. Intraoperative image showing A: Herniated small bowel loops within a left paraduodenal hernia sac. The blue arrow indicates the proximal jejunal loop, emerging immediately distal to the fourth part of the duodenum. The yellow arrow marks a dusky-appearing mid-jejunal loop, suggesting compromised vascularity. The white arrow points to the herniated proximal ileal loop. B: Following the reduction of the herniated bowel loops, a dusky jejunal segment is seen (marked by an asterisk). The curved green arrow indicates the fossa of Landzert, the site of herniation in the left paraduodenal hernias.

lateral to the fourth part of the duodenum [7]. CECT abdomen is the gold standard for diagnosis of LPDH, with a reported accuracy of up to 95 % and sensitivity of 95–100 % [2]. On CECT, it can appear as an abnormal cluster or sac-like mass of dilated small bowel loops to the left of the ligament of Treitz, lying between the stomach and pancreas, or between the transverse colon and the left adrenal gland posterior to the pancreatic tail, or in the left anterior pararenal space. The mesenteric vessels supplying the herniated bowel loops may appear crowded, engorged, and stretched at the entry of the hernial sac. The inferior mesenteric vein and ascending branch of the left colic artery form an important CT

landmark along the anterior margin of the hernia [7,12]. Our patient demonstrated a few dilated jejunal loops in the left upper abdomen in a plain X-ray abdomen with CT findings of closed-loop obstruction involving a small bowel with a transition point in the upper left abdomen, where bowel loops were clustered in a sac-like space behind the stomach in left pararenal space and to the left of the ligament of Treitz.

Surgery is the mainstay of treatment for LPDH, as the lifetime risk of incarceration or strangulation is more than 50 %, with a mortality risk of 20 %–50 % [8]. It involves the reduction of the bowel loops from the

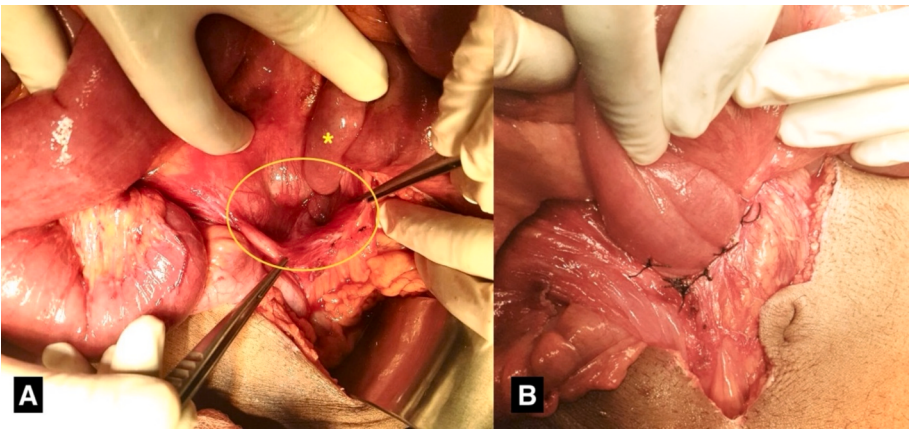


Fig. 4. Intraoperative images demonstrating anatomical details and surgical repair of a left paraduodenal hernia. A: The yellow circle outlines the fossa of Landert, the hernial orifice through which the bowel loops herniated. The asterisk marks the proximal jejunal loop immediately distal to the fourth part of the duodenum. B: Intraoperative view after reduction of herniated bowel loops and repair of the hernial defect, with restoration of normal anatomic alignment.

Table 1
Timeline of events.

Day/time	Event	Details
5 days before presentation	Symptom onset	Patient developed abdominal distention and vague abdominal pain.
3 days before presentation	Progression of symptoms	Bilious vomiting 1–2 h after meals began; no passage of stool or flatus.
Day 0	Presentation to Emergency Department	CECT abdomen: Closed-loop small bowel obstruction; clustered loops in left upper abdomen posterior to the stomach—suggestive of left PDH.
Day 0	Emergency Exploratory Laparotomy	- Left PDH identified to the left of the 4th part of the duodenum. - Bowel involved: 30 cm of jejunum forming closed loop and 150 cm of ileum. - Resection of 3 cm of nonviable jejunum. - End-to-end isoperistaltic anastomosis. - Primary defect repaired with absorbable sutures.
Postoperative day (POD) 2	Oral intake started	Liquid diet initiated.
POD 3	Diet progression	Shifted to soft diet.
POD 4	Continued recovery	Tolerating soft diet well.
POD 5	Drain removal	Abdominal drain was removed.
POD 7	Discharge	Patient discharged with stable vitals.
2-week follow-up	Early postoperative check	No complaints, well-healing surgical wound.
1-month follow-up	Mid-term follow-up	Patient remained symptom-free, no signs of recurrence.
6-month follow-up	Long-term outcome	Continued to be asymptomatic, no recurrence noted.

hernia sac and repairing the defect by either closing or widely opening the hernia orifice by incision along the avascular plane of the mesocolon or division of the inferior mesenteric vein so that the hernial sac becomes a part of the peritoneal cavity [2,8,13]. Both the laparoscopic and open surgical approaches can be performed. The advantages of the laparoscopic approach are decreased postoperative pain, reduced morbidity, and shorter hospital stays; however, long-term results are similar [2,14]. In our case, we reduced the content of the hernial sac and resected the gangrenous small bowel segment with end-to-end anastomosis and primary closure of the defect via an open approach. We performed an open surgical approach due to the patient's emergency presentation, features of bowel obstruction (limiting the space for laparoscopic surgery), limited resources, and lack of advanced expertise available in our setting. This case also underscores the diagnostic

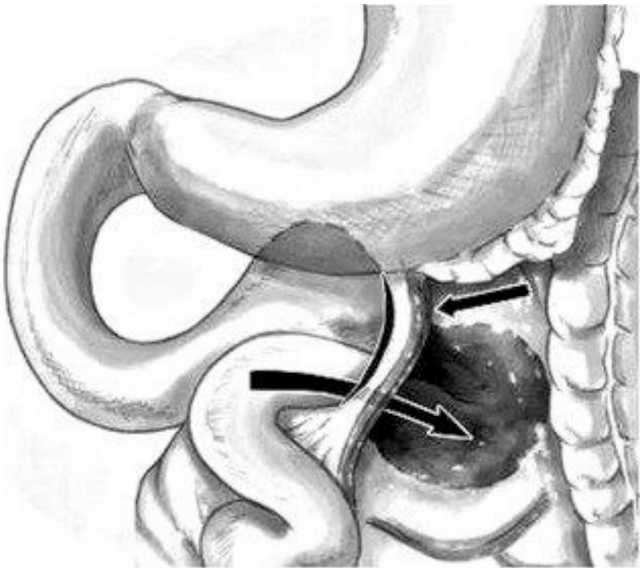


Fig. 5. Schematic diagram of a left paraduodenal hernia. Small bowel loops herniate through Landert's fossa (curved arrow), located to the left of the fourth part of the duodenum and positioned posterior to the inferior mesenteric vein and the ascending branch of the left colic artery (linear arrow) [10].

difficulty of LPDH in a virgin abdomen, especially in resource-limited settings where timely access to laparoscopic facilities is constrained. The rarity of the condition, coupled with nonspecific symptoms and the need for urgent intervention, reinforces the importance of maintaining a high index of suspicion even in the absence of prior abdominal surgery. A comparison of key features from published LPDH cases—including demographics, presentation, imaging, surgical approach, and outcomes—is summarized in Table 2. This contextualizes our findings and highlights the consistent role of CT in diagnosis and surgery in management, with generally favorable postoperative outcomes.

4. Conclusion

Left paraduodenal hernia, while rare, should be considered a differential diagnosis in patients presenting with nonspecific chronic abdominal symptoms or intestinal obstruction, especially in a virgin abdomen. Prompt diagnosis using CT imaging and timely surgical intervention is crucial to prevent complications and reduce morbidity and mortality. The choice of surgical approach should be individualized,

Table 2
Comparative analysis of left paraduodenal hernia (LPDH) cases on basis of patients demographics, symptoms, surgical approach, intraoperative findings and outcomes.

Case reference	Patient demographics	Presenting symptoms	Surgical approach	Intraoperative findings	Outcomes
Hassani et al. [6]	55-year-old male	Severe and constant diffuse abdominal pain for several hours	Emergency exploratory laparotomy	Small bowel reduced, volvulus untwisted, healthy small bowel	Full recovery; discharged day 4th postoperative day
Kadhem et al. [8]	26-year-old male	Generalized intermittent crampy abdominal pain, nausea, vomiting, similar episode (since 2 months)	Diagnostic laparoscopy converted to laparotomy	Dense adhesion, enterolysis	Asymptomatic at follow up.
Manojlović et al. [2]	39-year-old male	Spasmodic recurrent epigastric pain (since childhood)	Upper midline laparotomy	No bowel ischemia	Symptom resolution; no recurrence (6 months)
Giordano et al. [4]	19-year-old male	Acute transient abdominal pain in left abdominal quadrant, nausea, vomiting (6 months)	Laparotomy	Adhesions; no ischemia	Pain resolved; no recurrence.
Current case (2025)	51-year-old male	Abdominal distention, bilious vomiting, obstipation	Emergency laparotomy	3-cm nonviable jejunum (resected)	Full recovery; symptom-free at 6 months

considering patient factors and surgical expertise.

CRedit authorship contribution statement

Constructing hypothesis for the manuscript - Samrat Shrestha, Sabin K Ghimire, Mecklina Shrestha.
Planning methodology to reach the conclusion - Samrat Shrestha, Sabin K Ghimire, Mecklina Shrestha.
Organizing and supervising the course of the article and taking responsibility - Samrat Shrestha.
Patient follow-up and reporting – Suresh Maharjan, Mecklina Shrestha, Rabin K Ghimire.
Logical interpretation and presentation of the results - Samrat Shrestha, Sabin K Ghimire, Mecklina Shrestha, Suresh Maharjan, Rabin K Ghimire.
Construction of the whole or body of the manuscript - Samrat Shrestha, Sabin K Ghimire, Mecklina Shrestha, Suresh Maharjan, Rabin K Ghimire.
Reviewing the article before submission not only for spelling and grammar but also for its intellectual content - Samrat Shrestha, Sabin K Ghimire, Mecklina Shrestha, Suresh Maharjan, Rabin K Ghimire.

Consent

Written informed consent was taken from the patient who participated in this study for publication of this case report and accompanying images.

Ethical approval

The IRB at our institution has waived ethical approval for case reports.

Guarantor

The guarantor is Samrat Shrestha.

Research registration number

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Declaration of competing interest

The authors have no conflicts of interest to declare.

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