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CASE REPORT

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Accessory spleens, mixed hiatal hernia, and incisional hernias: a complex case of multidisciplinary surgical management

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Abstract

Background Accessory spleens, arising from incomplete fusion during embryogenesis, are frequent developmental anomalies detected incidentally in abdominal imaging studies. Despite surgical advancements, post-laparotomy incisional hernias persist, while hiatal hernias, common in older adults, often present asymptomatically.

Case presentation A 55-year-old male presented with abdominal pain, chronic vomiting, and gastrointestinal bleeding. Evaluation unveiled a mixed hiatal hernia alongside multiple accessory spleens, necessitating surgical intervention. A midline incision facilitated adhesion release, hernia repair, and a 360-degree Nissen fundoplication. Postoperatively, the patient stabilized, discharged with a liquid diet and medications. Histopathological analysis confirmed benign findings, emphasizing successful complex abdominal condition management.

Conclusion Comprehensive assessment is vital for patients with intricate gastrointestinal symptoms and surgical histories. Accurate diagnosis and intervention, encompassing accessory spleen excision and hernia repair, resulted in notable clinical enhancement devoid of complications.

Keywords Accessory spleen, Hiatal hernia, Incisional hernia, Nissen fundoplication, Splenectomy, Multimorbidity, Case report

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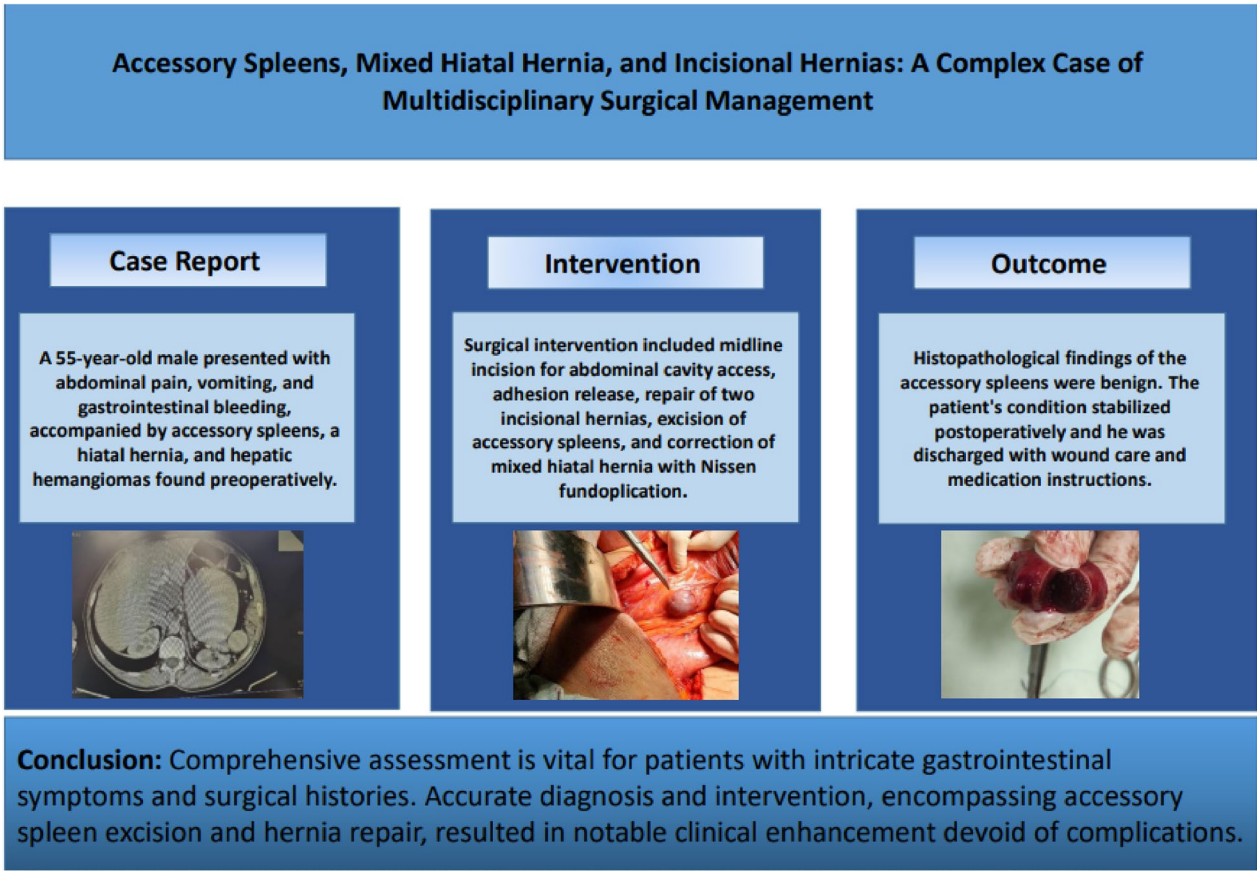
Graphical Abstract



Background

The spleen develops around the sixth week of embryonic life as a localized proliferation of the coelomic epithelium overlying the dorsal pancreatic endoderm [1]. The spleen can exhibit various developmental anomalies, including complete agenesis, multiple spleens (polysplenia), isolated small accessory spleens, and persistent lobulation. Accessory spleen (AS) may form during embryonic development, arising from the left side of the dorsal mesogastrium due to incomplete fusion of separate splenic masses [2]. AS is a small piece of splenic tissue that forms abnormally during fetal development. It is a common anomaly, observed in 10–30% of autopsies and in 16% of individuals undergoing abdominal CT scans with contrast dye [3]. The accessory spleen is commonly found in the hilum and vascular pedicle of the spleen, the tail of the pancreas, the greater omentum, and the splenic ligaments [4]. AS may be single or multiple, but there are rarely more than six [5]. Hiatal hernia (HH) is common, with a 20% prevalence, and involves stomach protrusion into the thoracic cavity, often linked to GERD symptoms like heartburn and dysphagia. Risk factors include obesity, aging, pregnancy, prior surgeries, and bone disorders [6]. On the other hand, advancements in surgical techniques for closing the abdominal wall have not dramatically curbed the prevalence of incisional hernias after laparotomy, with their occurrence remaining notably high at 11–20% [7].

To our knowledge, this represents the first documented case in medical literature featuring a unique triad of two accessory spleens, three concurrent hernias (mixed hiatal hernia and two incisional hernias), and three hepatic hemangiomas in one patient. Successful surgical management underscores the importance of recognizing such rare anatomical variations and their clinical implications.

Case presentation

A 55-year-old married man presented to the emergency department with a chief complaint of abdominal pain associated with chronic vomiting and upper and lower gastrointestinal bleeding. His past medical history included untreated hypertension, drug allergies, and anal hemorrhoids. The patient's surgical history was significant for a sigmoidectomy, splenectomy five years prior due to a blast injury to the lower left chest during the Syrian war, tonsillectomy, and the removal of a fatty mass

Table 1 Laboratory tests

Investigations	At presentation	Normal range
Hemoglobin (Hgb)	12.3 g/dL	13.0–16.0 g/dL
White Blood Cells (WBC)	9.4×10^9/L	$4.5–13.0 \times 10^9$/L
Red Blood Cells (RBC)	4.6×10^{12}/L	$4.5\_6.2 \times 10^{12}$/L
Hematocrit (HCT)	38.2%	40–54%
Urea	34.4 mg/dL	7–20 mg/dL
Partial Thromboplastin Time (PTT)	28 s	25–35 s
Prothrombin Time (PT)	14 s	11–14 s
Total Bilirubin (TB)	0.37 mg/dL	0.2–1.2 mg/dL
Direct Bilirubin (DB)	0.09 mg/dL	Less than 0.3 mg/dL
Aspartate Aminotransferase (AST)	14 U/L	14–20 U/L
Alanine Aminotransferase(ALT)	16 U/L	Up to 45 U/L
Calcium (Ca)	9.9 mg/dL	8.5–10.5 mg/dL
Platelets (PLT)	405×10^9/L	$150–450 \times 10^9$/L

An overview of the laboratory values of the patient upon admission

from the flank. The patient reported smoking cigarettes daily for the past 10 years, but he had no history of alcohol or drug use or any relevant family medical history.

Upon admission, his vital signs were as follows: heart rate was 110 beats per minute, blood pressure measured 130/90 mmHg, body temperature was 37 °C, and SpO_2 was 96%. During clinical examination, no pallor, jaundice, or cervical lymphadenopathy was detected. Cardiovascular examination revealed normal heart sounds, with no pathological changes observed in the electrocardiogram (ECG) or cardiac enzymes, which were both within normal limits. Chest auscultation was normal and symmetrical. Examination of the abdomen revealed a soft, non-tender abdomen with a firm, fixed palpable mass in the left upper quadrant. As for the genitourinary system, the patient complained of urinary hesitancy.

Laboratory findings revealed the following values: hemoglobin level was 12.3 g/dL, white blood cell count was 9.4×10^9/L, red blood cell count was 4.6×10^{12}/L, hematocrit was 38.2%, urea was 34.3 mg/dL, total bilirubin was 0.37 mg/dL, direct bilirubin was 0.09 mg/dL, aspartate aminotransferase was 14 U/L, alanine aminotransferase was 16 U/L, calcium level was 9.9 mg/dL, platelet count was 405×10^9/L, prothrombin time was 14.1 s, and partial thromboplastin time was 28 s (see Table 1). A contrast-enhanced CT scan of the chest, abdomen, and pelvis revealed normal pulmonary parenchyma without any suspicious nodular, alveolar, or interstitial densities. There was no evidence of pleural or pericardial effusion. A hiatal hernia approximately 5 cm in size was observed, accompanied by gastric dilatation. The liver dimensions were normal, with two hemangiomas identified in segment VI measuring 75 mm and 45 mm, alongside a relatively well-defined hypodense ovoid area in segment I measuring 50×40 mm. Additionally, a third smaller hemangioma was noted in the inferior portion of segment IV, not exceeding 12 mm. The spleen was surgically removed, with accessory spleens observed in its place, the largest measuring 38 mm. There was no free intraperitoneal fluid, and the major retroperitoneal vessels were normal with no lymphadenopathy observed (see Fig. 1).

A cardiology consultation revealed preserved systolic function, diastolic dysfunction, and mild tricuspid regurgitation. Endoscopic examinations were performed, and upper endoscopy revealed a mixed hiatal hernia (Type III) with signs of esophagitis. Lower endoscopy revealed small anal hemorrhoids, evidence of prior surgery on the sigmoid colon, transverse colonic edema 40 cm from the anal verge, and narrowing of the ascending colon 70 cm from the anal verge, with regular edges. Biopsies were obtained from the edematous and narrowed segments, revealing no evidence of dysplasia or malignancy. Based on the results of these investigations, the decision was made to proceed with open surgery after obtaining informed written consent from the patient.

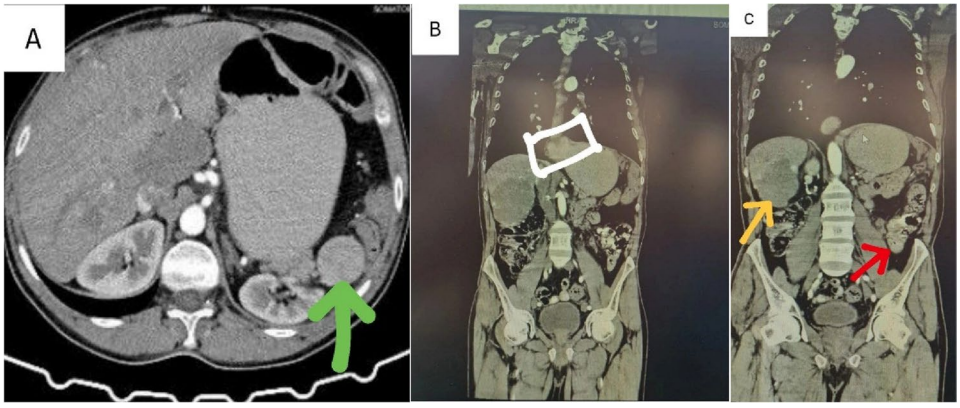


Fig. 1 A CT scan of the chest, abdomen, and pelvis with contrast injection. **A** Accessory spleen. **B** Hiatal hernia. **C** The yellow arrow indicates a hepatic hemangioma, while the red arrow indicates an accessory spleen

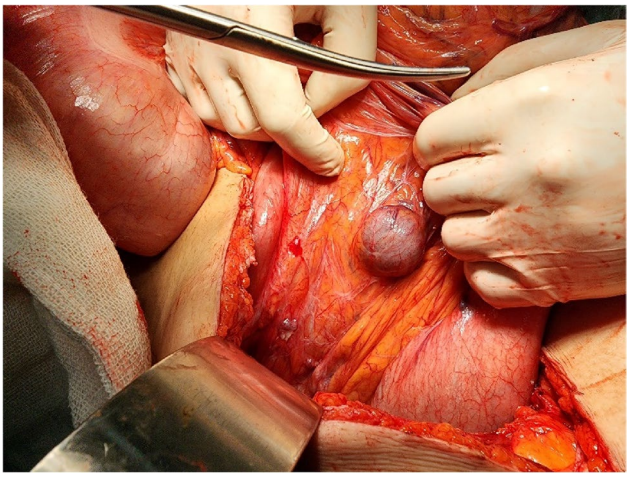


Fig. 2 Accessory spleen. The image shows the appearance of the first accessory spleen in the location where the spleen was removed five years ago

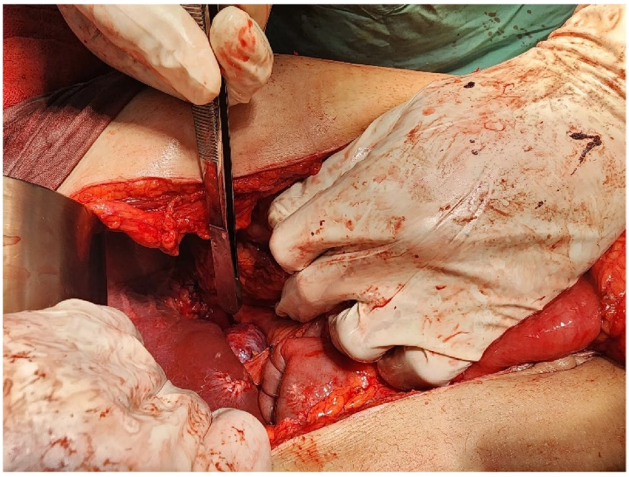


Fig. 3 Liver hemangiomas. During the surgical procedure, three hemangiomas were identified in the liver, two located in segment VI and one in the lower part of segment IV. No biliary tract or portal vein dilation was observed, and the hepatic veins appeared normal

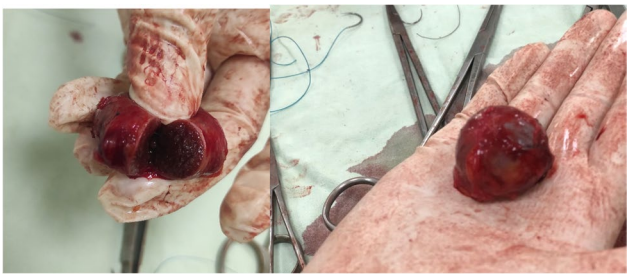


Fig. 4 After surgery. The image shows accessory spleens that were surgically removed and sent for pathological examination, with the largest accessory spleen measuring 38mm

During the surgical procedure, a midline incision was made below the umbilicus and extended to access the abdominal cavity. The descending colon was found to be significantly dilated and adhered extensively to surrounding intestinal loops and colonic structures; these adhesions were meticulously released with proper hemostasis. Additionally, two incisional hernias were identified: The first hernia, located on the anterior abdominal wall at the site of a prior emergency sigmoidectomy, measured approximately 4 cm in diameter. The second hernia, found on the left posterior abdominal wall (resulting from direct trauma due to bullet fragments, which had also necessitated the prior splenectomy), measured approximately 3 cm in diameter. Both hernias were repaired by reducing their contents and closing the defects. Several accessory spleens were found and all were removed (see Fig. 2). Furthermore, the mixed type hiatal hernia was addressed. The stomach and esophagus were mobilized and repositioned into the abdominal cavity, with adhesions around the diaphragmatic crura carefully released and hemostasis achieved. The diaphragmatic repair was performed by approximating the crura posteriorly with interrupted non-absorbable sutures to narrow the hiatus. A 360-degree gastric fundoplication (Nissen procedure) was then performed, guided by a 50-inch bougie to standardize wrap tightness, as the patient had significant reflux symptoms. Mesh was not utilized due to the hiatal defect being <5 cm with minimal tension after primary cruroplasty. The liver was found to have multiple hemangiomas that were not treated due to their benign nature and lack of symptoms (see Fig. 3). Finally, the abdominal layers were closed, and sterile dressings were applied (see Supplementary Video 1). Samples were taken from the accessory spleens and sent for histopathological examination (see Fig. 4).

Histopathological findings showed benign accessory splenic tissue with red pulp hyperplasia that showed vascular proliferation with no evidence of malignancy. Postoperatively, the patient was monitored in the intensive care unit and showed signs of stabilization by the fourth day after surgery. During his 8-day hospital stay, no complications were observed. The final diagnosis was accessory spleens and a mixed hiatal hernia. Upon discharge, the patient was instructed to adhere to a liquid diet, maintain wound hygiene, change dressings every two days, and continue prescribed medications, which included cefuroxime, dexlansoprazole, and rivaroxaban.

The patient was followed up in the outpatient clinic for a period of 3 months, during which significant improvement in reflux symptoms and overall health stability was documented.

Discussion

The spleen, located between the diaphragm and the stomach's fundus [8], plays a pivotal role in cleansing the body from microbes, producing white blood cells, filtering blood, and synthesizing antibodies. Over the years, medical literature has documented various congenital anomalies affecting the spleen, including accessory spleens, persistent fetal lobulation, polysplenia, asplenia, wandering spleen, and hyposplenia [9]. Although splenectomy surgeries are not common, rare complications may arise years after the procedure, such as the emergence of accessory spleens. Accessory spleen (AS) is described as a congenital anomaly that occurs due to failure in the fusion of primitive splenic buds [3]. Its prevalence does not exceed 30% among patients undergoing postmortem examinations, and its occurrence is noted to be higher in children under ten years and females between 20 and 40 years [10]. AS is often associated with significant conditions such as liver cirrhosis and blood disorders, potentially manifesting as masses mimicking malignant tumors. In most cases, it remains asymptomatic, but when a patient arrives in the emergency department with signs of bleeding, infarction, or rupture, surgical intervention becomes inevitable [11].

In our case, a 55-year-old patient, who had undergone splenectomy five years prior, presented to the emergency department complaining of abdominal pain, gastrointestinal bleeding, and chronic vomiting. The presence of a hiatal hernia, adhesions, and a large ventral hernia containing bowel loops in our patient suggests additional, more plausible explanations for chronic vomiting, rather than attributing the symptoms solely to the presence of a small accessory spleen (38 mm). Li et al. reported a case involving a 31-year-old female patient presenting to the emergency department with left upper quadrant abdominal pain persisting for 14 years after running exercises, highlighting that AS symptoms can persist non-specifically for years and then suddenly exacerbate critically, necessitating surgery [12]. In contrast, Taskin et al. described a rare case of a 43-year-old woman suffering from recurrent lower abdominal pain for six months, where radiological investigations revealed a left adnexal mass that, upon laparotomy and histopathological examination, was identified as pelvic AS [13]. Rarely, torsion and rotation of the accessory spleen's vascular pedicle can result in acute abdomen [14]. Previous studies have shown that pedicle torsion of AS is more common in children and young adults, while it is rare in older adults and the elderly [15]. Tc-99 m-labeled phytate scintigraphy remains the cornerstone imaging modality for evaluating and diagnosing AS [16]. However, in this case, CT imaging alone sufficed for preoperative diagnosis, providing adequate anatomical detail and confirming the presence of AS without requiring additional nuclear imaging. Diagnosing AS preoperatively is generally challenging, and inadequate expertise or diagnostic errors can lead to severe pathological consequences for patients, as illustrated in a case reported by Zou et al. Here, a diagnostic error led to the misidentification of an adrenal tumor in the left adrenal gland, which was removed, later determined by pathological examination to be an accessory spleen [17]. In our patient, endoscopy revealed a hiatal hernia, and surgery uncovered two additional incisional hernias, one at the site of the removed spleen and another at the site of sigmoidectomy, making our case uniquely remarkable. A previous report documented two accessory spleens associated with post-traumatic diaphragmatic hernia, further emphasizing the need for studies exploring the correlation between these entities [18]. Accessory spleens have also appeared in conjunction with rare syndromes such as Fryns syndrome, as reported by Pierson et al., involving a newborn female with several congenital anomalies, including AS, left diaphragmatic hernia, bilateral anophthalmia, facial dysmorphology, and severe pulmonary hypoplasia [19].

Regarding treatment, laparoscopy is considered very important in managing AS [20]. In our case, while laparoscopic surgery was initially considered, open surgery was preferred due to several factors. The extensive adhesions in the descending colon and surrounding intestinal structures required precise visualization and careful dissection, which is more effectively achieved through an open approach. Additionally, the presence of surgical hernia necessitated meticulous repair, and the removal of multiple accessory spleens required direct access for complete excision. Given the complexity of the procedure, the surgical team determined that an open approach would provide superior control and safety for the patient.

we performed 4 surgeries at once for the patient, which were successful despite the patient's complex surgical history.

Conclusion

This case underscores the importance of accurate evaluation of patients suffering from complicated gastrointestinal symptoms, specifically with the presence of extensive surgical history. Comprehensive diagnostic workup, including radiological (CT scan) and endoscopic examinations, made the identification of hiatal hernia, accessory spleen, and hepatic hemangiomas more facilitated. With the appropriate surgical intervention, including liberation of intestinal and colonic adhesions, accessory spleen removal, hernias repair, and Nissen fundoplication, all led to significant clinical improvement without notable complications. Finally, our paper emphasizes the importance of a multidisciplinary approach to achieve optimal therapeutic outcomes, representing a rare combination of anatomical anomalies. This

highlights the necessity of vigilance in post-splenectomy patients to detect potential accessory spleens that could contribute to complex presentations.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12245-025-00917-0.

Supplementary Material 1.

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Authors' contributions
H.H., M.M.M., F.H.A., E.S.Kh., D.A.N., R.A., B.A., Y.Z., R.A., M.A., and Rawad Asami wrote the main manuscript text. Dr. Hamdah Hanifa and Dr. Abdullah Shekh Najjaren conceived and supervised the conduct of the study. All authors critically reviewed and revised the manuscript.

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Data availability
No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate
Not applicable. As it's a case report, it is exempted from ethical approval by local institution responding on the case.

Consent for publication
Written informed consent was obtained from the patient for publication of this study and accompanying images and video.

Competing interests
The authors declare no competing interests.

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