



A RARE CASE OF MULTIPLE SPLENIC CYSTS WITH CALCIFICATION IN A 47-YEAR-OLD MAN: A CASE REPORT

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ABSTRACT

Background: Splenic cyst is a rarely encountered disorder, with an incidence of approximately 0.07–3% of the population. The majority of cases are asymptomatic and are detected incidentally; however, large or multiple cysts may give rise to symptoms as a result of mass effect. Multiple splenic cysts accompanied by calcification constitute an exceedingly rarely reported condition and therefore require particular attention in their diagnosis and management.

Methods: This case report employs a descriptive approach to a 47-year-old male patient who presented with a complaint of left upper abdominal pain. The diagnosis was established through history taking, physical examination, laboratory investigation, abdominal CT scan imaging, and postoperative histopathological confirmation.

Results: A 47-year-old man presented with a complaint of left hypochondrial pain radiating to the left shoulder, accompanied by

a sensation of abdominal fullness. Abdominal CT scan demonstrated multiple cystic lesions of the spleen with mural calcification, measuring approximately $9.4 \times 8.8 \times 9.5$ cm. The patient underwent total splenectomy. Histopathological examination confirmed a benign splenic cyst with calcification, with no features of malignancy or parasitic infection identified.

Conclusion: Multiple splenic cysts with calcification constitute a rarely encountered case. The diagnosis requires a combination of clinical, radiological, and histopathological findings. In cases with significant clinical symptoms, large size, or multiple lesions, total splenectomy may serve as the definitive therapeutic option, with favourable outcomes.

Keywords : Splenic cysts, calcification, splenectomy, case report, multiple splenic cysts

INTRODUCTION

The spleen (lien) is a secondary lymphoid organ that plays an important role in the generation of the immune response and in the filtration of blood. This organ functions in the elimination of senescent erythrocytes, the filtration of foreign material from the circulation, and the storage of platelets and granulocytes (Ohgami & Arber, 2017). Splenic lesions are relatively uncommon, including both neoplastic lesions and tumour-like lesions such as hamartoma and splenic cyst (Reta et al., 2025).

Splenic cyst is a rare disease, with a reported incidence of approximately 0.07–3%, and occurs more frequently in women (Lukman et al., 2023). On the basis of aetiology, splenic cysts are classified into parasitic and non-parasitic cysts. Non-parasitic cysts are further subdivided into primary (true) cysts and secondary (false) cysts according to the presence or absence of an epithelial lining of the cyst wall (Ibikunle et al., 2024). Primary cysts possess an epithelial lining and account for approximately 20% of all cases of splenic cyst, whereas secondary cysts are more frequently encountered and are generally associated with a history of abdominal trauma (Ohgami & Arber, 2017).

The pathogenesis of splenic cyst remains incompletely understood to date. Several theories propose that cysts may arise from invagination of the mesothelium during embryonic development, from the splenic lymphatic spaces, or from heterotopic endodermal inclusions that undergo metaplasia (Soo et al., 2021). The majority of splenic cysts are asymptomatic and are detected incidentally during imaging examinations. However, large or multiple cysts may give rise to symptoms attributable to mass effect, in the form of left upper quadrant abdominal pain, a sensation of fullness, nausea, vomiting, and even left shoulder pain resulting from diaphragmatic irritation (Vela Martinez et al., 2024; Stoyanov et al., 2024).

The diagnosis of splenic cyst is established through a combination of clinical manifestations, imaging examinations, and histopathology. Ultrasonography (US), computed tomography (CT) scan, and magnetic resonance imaging (MRI) play an important role in determining the size, location, and characteristics of the lesion. Nevertheless, the definitive diagnosis is still established by

histopathological examination, in order to distinguish a true cyst from a false cyst and to exclude the possibility of malignancy (Ibikunle et al., 2024).

The management of splenic cyst depends on the size, number, location, and clinical symptoms produced. Small asymptomatic cysts are generally managed conservatively with periodic observation, whereas cysts that are symptomatic, large, multiple, or involve the splenic hilum require operative intervention. Therapeutic options comprise percutaneous aspiration, marsupialisation, partial splenectomy, and total splenectomy (Merad et al., 2021; Stoyanov et al., 2024).

This case report discusses a 47-year-old male patient with multiple splenic cysts accompanied by calcification, established through clinical, radiological, and histopathological examination, and managed by splenectomy.

CASE REPORT

A 47-year-old man presented to Harjono Ponorogo Regional General Hospital with a complaint of left upper abdominal pain of approximately one month's duration prior to hospital admission. The complaint was perceived to have worsened over the two weeks preceding admission, with symptoms aggravated by strenuous physical activity. The patient described abdominal pain radiating to the left shoulder together with a sensation of fullness, to the extent of difficulty in breathing. Bloody stools were denied; nausea and vomiting were present (+). The patient reported weight loss over the preceding month. He had a history of perforated appendicitis, for which appendicectomy was performed via laparotomy in March 2026.

With regard to social and economic history, the patient is a farmer. He lives in a rural village, in a privately owned house comprising a main building, a terrace, and two indoor bathrooms (squat toilets with ceramic flooring). He lives with his wife and one child. Relationships with family, neighbours, and friends are good, and his financial needs are adequately met. With regard to habits, the patient is actively employed as a rice-field farmer. His dietary pattern is regular, three times daily with wholesome accompaniments (tofu, tempeh, eggs, vegetables); however, he frequently consumes fatty foods and sweetened beverages. He very rarely engages in physical exercise.

The general condition of the patient appeared weak. The level of consciousness was GCS E4V5M, blood pressure 125/80 mmHg, temperature 36.5 °C, heart rate 88 beats per minute, respiratory rate 20 breaths per minute, and SpO₂ 99%.

On general status examination, the head appeared normocephalic, the conjunctivae were not anaemic (–/–), the sclerae were not icteric (–/–), the eyes were not sunken (–/–), the labial mucosa was not dry (–), and there was no cervical lymphadenopathy. On physical examination of the lungs, inspection demonstrated symmetrical expansion of the right and left hemithorax; palpation demonstrated equal tactile fremitus; percussion of the lungs yielded a resonant note over both lung fields; and auscultation revealed vesicular breath sounds over both lung fields, with no adventitious sounds identified.

On physical examination of the heart, inspection demonstrated that the apex beat was not visible; palpation demonstrated a forceful, heaving apex beat; percussion of the heart yielded dullness; and auscultation demonstrated regular first and second heart sounds, with no additional sounds heard.

On physical examination of the abdomen, inspection demonstrated an asymmetrical abdominal wall, distension (+), no impression of ascites (–), and the presence of a mass (+). On auscultation, peristalsis was not increased (–) and was normal. Percussion was tympanic, with tenderness in the left hypochondriac region (+) and a palpable enlargement of the spleen (+); no hepatomegaly was palpable, and the kidneys were not palpable. On examination of the extremities, the acral regions of both lower extremities were warm, with a capillary refill time of < 2 seconds.

On local status examination of the left hypochondriac region, a palpable mass measuring 9 × 8 cm and hard in consistency was identified.

On supporting laboratory investigation dated 12 May 2026, the results were haemoglobin 16.3, WBC 7.18, platelets 216, haematocrit 50, and PCT 1.9 (H). On supporting laboratory investigation dated 16 May 2026, the results were haemoglobin 14.7, WBC 22.93 (H), platelets 347, haematocrit 53, and PCT 3.4 (H).

The results of the three-phase bolus MSCT of the abdomen performed on 31 March 2026 demonstrated a cystic lesion with rim calcification, well-defined margins, and irregular borders,

measuring approximately $9.4 \times 8.8 \times 9.5$ cm in the spleen, which showed no contrast enhancement following contrast administration and no extension of the mass into adjacent structures. Liver: normal in size, normal in density, with no dilatation of the intrahepatic or extrahepatic bile ducts; the portal and hepatic veins were normal; no mass or nodule was seen. Gallbladder: normal in size, normal in density, with no mass, calculus, or cyst. Pancreas: normal in size, normal in density, with no mass, calculus, or cyst. Right kidney: normal in size, with normal parenchymal density, no ectasia of the pelvicalyceal system, and no mass, calculus, or cyst. Urinary bladder: adequately filled with fluid, with no wall thickening, calculus, or mass. Prostate: normal in size, with normal parenchymal density. No free extraluminal fluid density was seen within the abdominal cavity. Minimal fluid density was seen in the right and left pleural cavities. No locoregional lymphadenopathy was seen. No osteolytic or osteoblastic process was seen; osteophytes were seen at the visualised lumbar vertebral bodies. Conclusion: a cystic lesion with rim calcification measuring approximately $9.4 \times 8.8 \times 9.5$ cm in the spleen, which may represent a pseudocyst or a hydatid cyst; bilateral pleural effusion; lumbar spondylosis; left hypochondriac region. Conclusion: suspected calcification of the spleen.



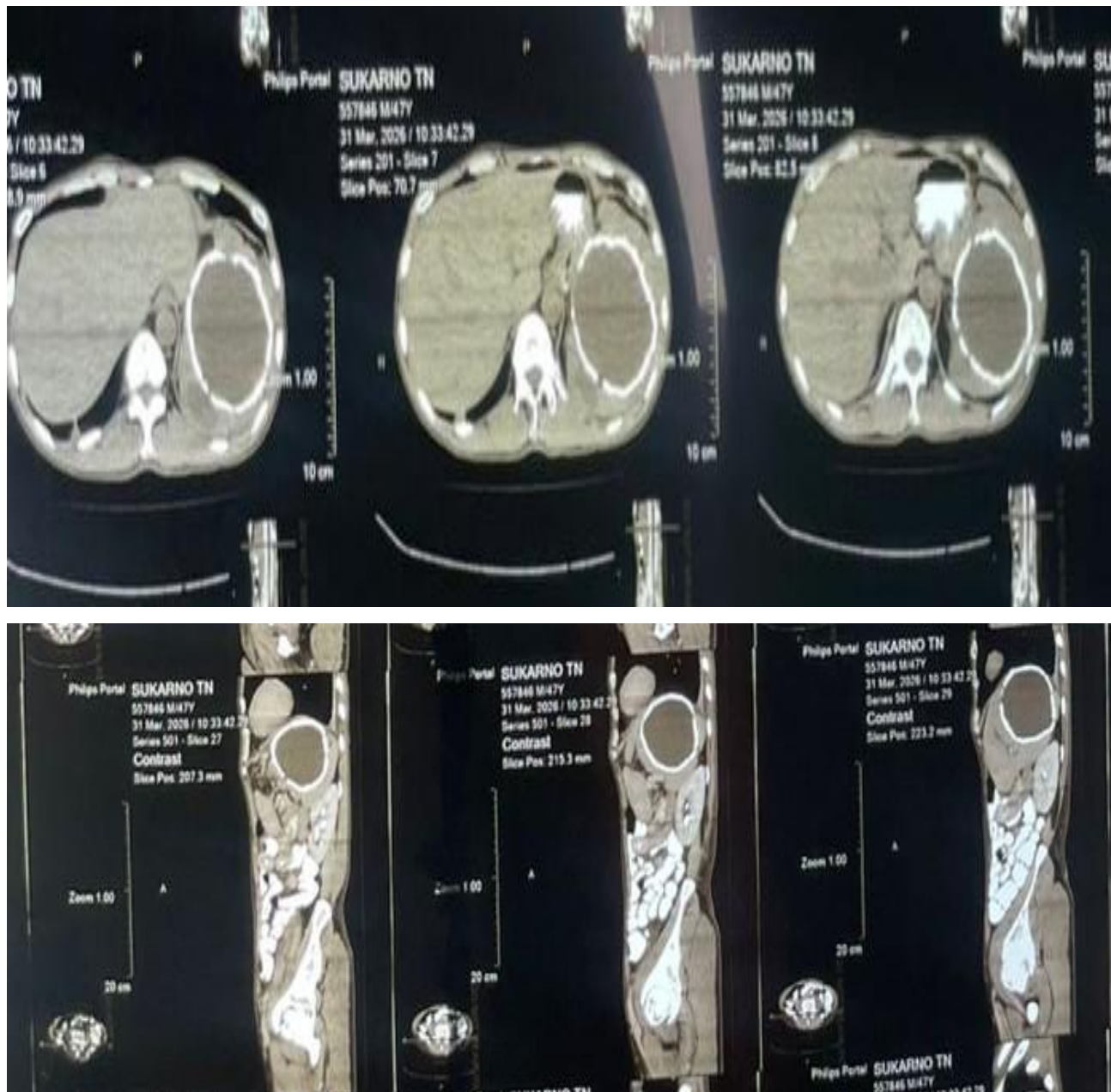


Figure 1. Abdominal CT Scan

The results of the AP/PA chest radiograph dated 12 May 2026 demonstrated a cardiac silhouette of normal size; in the lungs, no infiltrate or hilar thickening was seen in the right or left lung; the bronchovascular pattern was normal; both costophrenic sinuses were sharp; and

calcification was seen in the left hypochondriac region. Conclusion: heart and lungs normal; suspected calcification of the spleen.



Figure 2. Chest Radiograph

The patient underwent a splenectomy procedure.



Figure 3. Splenectomy

On anatomical pathology examination, the splenectomy specimen weighed 1,100 grams and measured approximately $17 \times 12 \times 9$ cm. The consistency was firm and hard, and the colour was greyish. On sectioning, a cyst with a hard wall measuring 9 cm in diameter and containing mucoid fluid was seen. Microscopic examination: cystic tissue with a wall of hyalinised connective tissue, partly lined by a single layer of cuboidal epithelium, eroded, with diffuse infiltration by lymphocytes and histiocytes, together with calcification. The lumen contained mucinous material. Splenic tissue with red pulp and white pulp was seen. Haemorrhage and infiltration by lymphocytes and histiocytes were seen. No skin adnexa were seen, no parasitic organisms were seen, and no features of malignancy were seen. Conclusion: spleen, splenectomy — benign splenic cyst accompanied by calcification. The diagnosis in this patient was multiple splenic cysts accompanied by calcification.

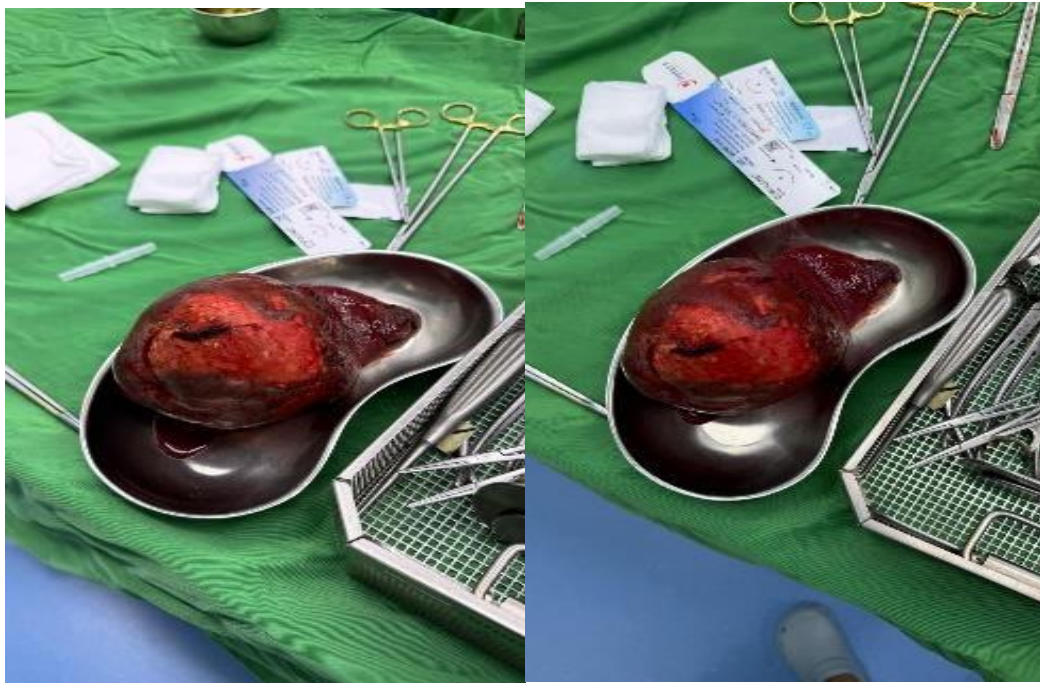


Figure 4. Anatomical Pathology Specimen

DISCUSSION

The spleen (lien) is a secondary lymphoid organ that functions in the generation of the immune response and in the filtration of blood (Ohgami & Arber, 2017). Neoplastic lesions of the spleen are an uncommon condition. Splenic tumours are classified into lymphoid tumours, non-lymphoid tumours, metastatic tumours, and tumour-like lesions, including cysts and hamartomas (Reta et al., 2025). Splenic cyst is a rare disease, with an incidence of approximately 0.07–3%, and occurs more frequently in women (Lukman et al., 2023).

Splenic cysts are classified into primary (true) cysts and secondary (false) cysts. Primary cysts account for approximately 20% of all splenic cysts. These cysts are generally unilocular and possess a thick fibrous wall with trabeculae lined by mesothelial cells or squamous epithelium. The epithelial lining of primary cysts may appear discontinuous, with denuded areas that may resemble secondary cysts (Ibikunle et al., 2024).

Primary splenic cysts are further classified into parasitic and non-parasitic cysts (Ibikunle et

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al., 2024). Parasitic cysts, although uncommon, are generally caused by *Echinococcus* species (50–80%). In rare cases, approximately 0.5–4% of hydatid disease may result in the formation of parasitic cysts within the spleen (Lukman et al., 2023).

Secondary cysts account for approximately 80% of all splenic cysts and are frequently associated with a history of abdominal trauma. These cysts are usually unilocular and thin-walled. In contrast to primary cysts, secondary cysts lack an epithelial lining, and the likelihood of recurrence is therefore low even when only partial resection is performed (Ohgami & Arber, 2017).

Type of Splenic Cyst	Etiology	Pathogenesis	Key Characteristics	Common Treatments
True cysts (primary)	Congenital	Developmental anomalies in the splenic tissue; mesothelial origin	Epithelial lining, typically solitary, may grow large	Cyst excision, partial splenectomy
Pseudocysts (secondary)	Trauma, hematologic disturbances	Result from trauma or infarction	Lack epithelial lining, often irregular shape	Observation, cyst marsupialization
Parasitic cysts	<i>Echinococcus granulosus</i> infestation	Parasitic infection	Often multiple, can cause hydatid disease	Antiparasitic treatment, cyst removal
Sarcomatous cysts	Rare, malignant potential	Neoplastic origin	May mimic benign cysts but have malignancy risk	Splenectomy, oncologic follow-up

Table 1. Classification and Characteristics of Splenic Cysts (Ibikunle et al., 2024).

The pathogenesis of splenic cyst remains incompletely understood; however, three theories have been proposed. The first theory states that invagination of the mesothelial layer occurs following rupture of the splenic capsule during embryonic development. This layer is pluripotent and may undergo metaplasia accompanied by fluid secretion, ultimately resulting in cyst formation (Soo et al., 2021).

The second theory is the lymphatic space theory, which states that cysts originate from the normal lymphatic spaces of the spleen. The final theory is the endodermal inclusion theory, which

states that splenic epithelial cysts develop as a result of true metaplasia of heterotopic endodermal inclusions within the spleen, analogous to the first theory. However, several studies have reported that the epidermoid nature of such cysts may be attributable to teratomatous differentiation or to inclusion of fetal squamous epithelium rather than to a metaplastic process (Soo et al., 2021).

Splenic cysts are generally diagnosed incidentally, except when they are sufficiently large to produce mass effect or complications (Soo et al., 2021). Patients with splenic cysts generally present with non-specific symptoms such as abdominal pain, discomfort, and bloating. In some cases, however, cysts may be asymptomatic and detected incidentally during imaging performed for other conditions (Ibikunle et al., 2024).

Small splenic cysts generally rarely produce symptoms and are for the most part detected incidentally, whereas large or multiple splenic cysts usually manifest as dull pain or abdominal discomfort (Stoyanov et al., 2024).

The clinical manifestations of splenic cyst generally comprise left upper quadrant abdominal pain, nausea, and vomiting, which occur as a consequence of the mass effect of the cyst on the surrounding organs. In some cases, patients may also experience fever, cough, or left shoulder pain resulting from diaphragmatic irritation. Complaints usually appear when the cyst enlarges and exerts pressure on adjacent structures (Vela Martinez et al., 2024).

The diagnosis of splenic cyst is established through a combination of clinical manifestations, supporting imaging examinations, and histopathological analysis. Ultrasonography (US), computed tomography (CT) scan, and magnetic resonance imaging (MRI) are used to determine the size, location, and characteristics of the cyst, such as simple versus complex and cystic versus solid, which are important in determining management. In addition, fine-needle aspiration cytology (FNAC) or core-needle biopsy may be performed to confirm the diagnosis and to exclude the possibility of malignancy (Ibikunle et al., 2024).

The majority of splenic cysts are asymptomatic, and the diagnosis therefore frequently poses a challenge. Imaging examinations combined with immunological testing may assist in establishing the diagnosis. Radiological appearances may vary, ranging from cystic to solid lesions, and from unilocular to multivesicular cysts. Calcification of the cyst wall may also be identified (Lukman et

al., 2023).

Various imaging modalities may be used to establish the cystic nature of a lesion, with ultrasonography (US) as the initial imaging modality of choice. For large lesions, cross-sectional imaging such as contrast-enhanced computed tomography (CECT) or magnetic resonance imaging (MRI) is required for further characterisation and for assessment of the origin and extent of the cyst. In this patient, CT scan was selected because of its greater availability as a supporting investigation (Soo et al., 2021).

Immunological investigations such as haemagglutination inhibition (HAI), enzyme-linked immunosorbent assay (ELISA), and Western blot may assist in confirming the diagnosis. However, when the cyst remains intact, has undergone calcification, or is sterile, immunological testing may yield negative results or may be insufficient to establish a definitive diagnosis (Lukman et al., 2023).

A definitive diagnosis of splenic cyst can be established only through histopathological examination (Soo et al., 2021). Histological examination demonstrates that the cyst wall is composed of fibrous tissue without an epithelial lining, and that calcification is present within this fibrous wall (Jin & Li, 2016).

The majority of primary non-parasitic splenic cysts (NPSC) are solitary, although in rare cases they may be multiple. Histologically, NPSC possess an epithelial lining, and on immunohistochemical examination the epithelial cells are positive for pan-cytokeratin and negative for CD240 (a lymphatic marker) and CD34 (an endothelial cell marker) (Soo et al., 2021).



Figure 5. Histopathological Examination of Splenic Cyst (Jin & Li, 2016).

The preoperative diagnoses based on CT scan comprised splenic pseudocyst, hydatid cyst, and non-parasitic splenic cyst — on account of the presence of a cystic lesion with rim calcification in the spleen — as well as splenic haemangioma, true epithelial cyst, and epidermoid cyst. Splenic pseudocyst is a type of splenic cyst that is encountered more frequently than true cyst, with approximately 75% of cases related to a history of trauma. Pseudocysts are formed as the final stage of organisation of a chronic intrasplenic haematoma, which subsequently forms a fibrous capsule accompanied by calcium deposition, such that on imaging examination it may appear as septal calcification or rim calcification; approximately 50% of pseudocysts demonstrate calcification, as in the present case. The patient had a previous history of abdominal trauma for which exploratory laparotomy was performed (Tiwari et al., 2023).

Hydatid cyst was also considered as a differential diagnosis, since it may produce the appearance of a cystic lesion with mural calcification. However, neither a characteristic history of exposure nor the appearance of daughter cysts supporting *Echinococcus* infection was identified (Badwaik et al., 2024).

Splenic haemangioma is the most common benign primary neoplasm of the spleen and may be of the cavernous or capillary subtype. Patients are generally asymptomatic; however, when the haemangioma is large, rupture may occur in up to 25% of cases. Splenic haemangiomas are usually small in size and demonstrate slow growth associated with non-encapsulated vascular proliferation. Calcification within a haemangioma may appear as central punctate, curvilinear, or speckled foci in areas of thrombosis. On multiphase CT, splenic haemangioma typically demonstrates a hypoattenuating lesion on non-contrast CT, occasionally with discontinuous peripheral enhancement together with uniform delayed enhancement reflecting pooling of blood, although this pattern may be obscured by parenchymal enhancement.

True epithelial cysts arise incidentally and generally do not produce symptoms; these cysts are also referred to as benign epithelial cysts. True epithelial cysts are formed during development, with an outer cuboidal epithelium and an inner endothelium, and result from infolding of the peritoneal mesothelium within the spleen. Imaging demonstrates a well-defined unilocular cystic mass with a wall that may be partially calcified but is otherwise imperceptible. The internal fluid is hypoattenuating and does not enhance. Some cysts may possess internal septations that enhance following contrast administration. Up to 14% of true epithelial cysts may demonstrate thin curvilinear mural calcification, but calcification may also be seen within the septations.

Epidermoid cyst is the rarest type of true cyst and is thought to develop from mesothelial cells entrapped within the spleen during early embryonic development. The patients are frequently children or young adults, who are usually asymptomatic. Histopathological analysis demonstrates an inner lining of stratified squamous epithelium and a wall of fibrous tissue surrounding a fluid-filled cavity. Where present, calcification is thin and curvilinear and lies along the peripheral wall or along the internal septations. However, calcification occurs far less frequently in these cysts than in pseudocysts.

Splenic cysts may give rise to life-threatening conditions as a result of spontaneous or traumatic rupture, infection, and splenic haemorrhage, which may ultimately precipitate anaphylaxis (Switters, 2021). Total splenectomy has long been the principal option in the management of large symptomatic splenic cysts. In recent years, however, spleen-preserving

approaches have increasingly been advocated in view of the risk of overwhelming post-splenectomy infection (OPSI), which may reach 4%, with a mortality rate of approximately 1.5% (Soo et al., 2021).

The management of splenic cyst may be undertaken by various methods, such as alcohol sclerotherapy injection, marsupialisation, partial or total splenectomy, and percutaneous aspiration. Percutaneous aspiration and marsupialisation carry a risk of cyst recurrence and, in the worst case, may ultimately necessitate splenectomy (Rachman et al., 2022).

The use of sclerosing agents such as alcohol and tetracycline may reduce the risk of cyst recurrence. Standard management comprises total or partial splenectomy. Aspiration and puncture of the cyst may be performed to reduce intracystic pressure through drainage of fluid; however, splenectomy remains preferred as the definitive therapy (Merad et al., 2021).

In symptomatic or large splenic cysts, operative intervention requires consideration. Partial splenectomy is more advisable for solitary cysts of small to moderate size, whereas total splenectomy is generally selected for cysts that are large, multiple, or located at the splenic hilum (Stoyanov et al., 2024).

Partial splenectomy may give rise to recurrence and postoperative haemorrhage; nevertheless, total splenectomy should be avoided as far as possible on account of the risk of sepsis, particularly in children (Merad et al., 2021).

CONCLUSION

A case of multiple splenic cysts accompanied by calcification in a 47-year-old man has been reported. The diagnosis was established on the basis of a history of a left upper quadrant lump that was painful on strenuous activity, with radiation to the left side of the back. The patient had an unhealthy lifestyle, such as consumption of fatty foods and infrequent physical exercise. On physical examination, a palpable mass was identified in the left hypochondriac region. On anatomical pathology examination, caecum–ileum: measuring approximately 17 × 12 × 9 cm. The consistency was firm and hard, and the colour was greyish. On sectioning, a cyst with a hard wall

measuring 9 cm in diameter and containing mucoid fluid was seen. Microscopic examination: cystic tissue with a wall of hyalinised connective tissue, partly lined by a single layer of cuboidal epithelium, eroded, with diffuse infiltration by lymphocytes and histiocytes, together with calcification. The lumen contained mucinous material. Splenic tissue with red pulp and white pulp was seen. Haemorrhage and infiltration by lymphocytes and histiocytes were seen. No skin adnexa were seen, no parasitic organisms were seen, and no features of malignancy were seen. The management provided consisted of total splenectomy.

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