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Case report

23-year old man with a long history of abdominal pain, nausea and vomiting: Case report of a splenic cyst

Alina Samia Senn *, Robert Christian Bauer, Andres Heigl, Robert Rosenberg

Klinik für Allgemein-, Viszeral-, Gefäss- und Thoraxchirurgie, Kantonsspital Baselland, Liestal, Switzerland

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ABSTRACT

Introduction: Splenic cysts are rare. They are usually incidentally diagnosed and there is no harmonised treatment pathway. We report a case of a large splenic epidermoid type cyst without history of previous abdominal trauma.
Presentation of case: A 23-year old male patient presented with symptoms of upper abdominal pain, nausea and vomiting. Except for a tenderness in the upper and lower left quadrant of the abdomen, the initial examination showed no extraordinary findings. A contrast enhanced computed tomography revealed a large singular splenic cyst displacing neighbouring structures. Echinococcus serology was tested negative. A laparoscopic fenestration of the superficially located splenic cyst was performed. Perioperative course was free of complications. Histopathological analysis of the excisate showed a squamous lining indicating the cyst as epidermoid type.
Discussion: Non-parasitic cyst types include traumatic, neoplastic, degenerative and congenital cysts. Due to its considerable size, our patients splenic cyst was diagnosed after occurring symptoms lead to further examination (CT scan). Laparoscopic fenestration of the cyst was chosen as the optimal surgical approach because of the superficial location of the cyst and to preserve residual splenic parenchyma. In the present case, recurrence of the splenic cyst appeared, which left the patient with a total splenectomy as the final treatment choice.
Conclusion: Due to the unspecific symptoms, the diagnosis of a splenic cyst can be prolonged. Choosing the adequate surgical technique to avoid complications is crucial. By deepening the understanding of the condition and surgical approaches, we can improve diagnostic and therapeutic management for affected patients.

1. Introduction

A splenic cyst is a rare encounter in a physician's daily routine. An incidence rate of 0.07% has been reported [1]. Since the first classification of splenic cysts in 1913 [2], a broad agreement has been made over recent classifications. Due to its mostly asymptomatic or oligosymptomatic appearance, the diagnosis of splenic cysts is mostly coincidental [3–5]. For the diagnostic and therapeutic management of splenic cysts, current literature found merely a rough accordance. Treatment options reach from fenestration and drainage to total splenectomy.

This case report refers to a symptomatic male patient who was referred to our hospital by the family physician due to a striking ultrasound finding. By contrast enhanced computed tomography the diagnosis of a large splenic cyst was made. The patient underwent laparoscopic fenestration of the cyst. Postoperative histopathological findings confirmed the etiology of the cyst as epidermoid type.

This case report was established conforming to the SCARE Criteria [6].

2. Presentation of case

A 23-year-old male patient was referred to the hospital by the treating family physician. A splenomegaly was observed by ultrasound. The patient presented with worsening symptoms of upper abdominal pain, nausea and occasional vomiting. After further inquiry, these symptoms were occurring intermittently for many years. Furthermore, a lack of appetite and weight loss of around 20 kg over the last few weeks was observed. Other symptoms, such as fever or night sweats, and a history of trauma or exposure to hydatid disease were denied. The past medical history included the diagnosis of a temporal lobe epilepsy as well as an intellectual disability, which was not specifically defined. The abdominal surgical history was clear. The patient received carbamazepine as antiepileptic therapy and a vitamin D deficiency was treated with supplements.

The initial examination of the patient showed no fever, normal

* Corresponding author at: Kantonsspital Baselland, Rheinstrasse 26, 4410 Liestal, Switzerland.
E-mail address: alina.senn@ksbl.ch (A.S. Senn).

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cardiopulmonary function and tenderness in the upper and lower left quadrants of the abdomen. The patient was at a normal weight (BMI 20.4 kg/m^2) with no signs of malnutrition (albumin 48 g/L, haemoglobin 149 g/L). Further blood tests showed an isolated gamma-glutamyltransferase elevation and thrombocytopenia with 88 $\times$ 10^9/L.

In the CT scan (Fig. 1), a large singular, superficially located splenic cyst was observed with dimensions of 11 $\times$ 17 $\times$ 17 cm. It appeared to be a hypodense, noncalcified lesion in the splenic parenchyma with well-defined margins that did not take up contrast medium. Displacement of neighbouring structures, such as the stomach, left kidney and the proximal abdominal aorta, was observed (Fig. 1A).

To rule out a parasitic etiology, echinococcus serology was performed, and the result came back negative.

The surgical recommendation for an elective laparoscopic fenestration of the cyst was given. There was informed consent, also in terms of conversion to an open procedure and splenectomy, as there was a risk with regard to haemorrhage.

Preoperative fasting was executed according to anaesthetists' protocol. The patient was given a dose of prophylactic intravenous antibiotic (Cefuroxime). The surgery was performed by two experienced senior general surgeons and the patient was under general anaesthesia. The patient was placed in a supine position. Intraoperatively, the cyst was easily accessible as it did not adhere to neighbouring structures. By laparoscopic ultrasound, the incision site with the thinnest wall was chosen for incision, drainage and cyst wall fenestration (Fig. 2).

There were no perioperative complications. Thrombocytopenia was relieved after surgery. The patient was discharged on the third post-operative day with instructions regarding post-laparoscopic measures.

2.1. Pathology report

The fenestrated, excised tissue of the cyst measured 10 $\times$ 8 $\times$ 1.2 cm and showed a smooth border on one side; on the inner surface, a trabecular structure and knobby consistency was observed (Figs. 3, 4A).

Analysis of the epithelium showed a squamous lining (Fig. 4B).

Postoperatively, the patient was symptomatic with recurrence of the cyst and finally a total splenectomy was performed.

3. Discussion

Splenic cysts are a rare encounter. Since splenic cysts were first classified in 1913 [2], a broad agreement has been made over recent classifications. Splenic cysts are categorised as either parasitic or non-parasitic, as well as primary (true) and secondary (false/pseudo). Non-parasitic cyst types include traumatic, neoplastic, degenerative and congenital [4,7].

The diagnosis of congenital cysts is done solely by histological evaluation and they are classified by the type of cystic lining, ranging from mesothelial, stratified squamous to transitional [3]. Non-parasitic cysts account for 25% of all splenic cysts, of which congenital cysts present the minority of only 20% [8]. At present, only a few hypotheses exist concerning the pathogenesis of congenital splenic cysts [7]. In the literature, debates on their origin are ongoing, from peritoneal mesothelial cells or displacement of epithelium during embryogenesis [7].

While the diagnosis of splenic cysts is mostly incidental by CT scans

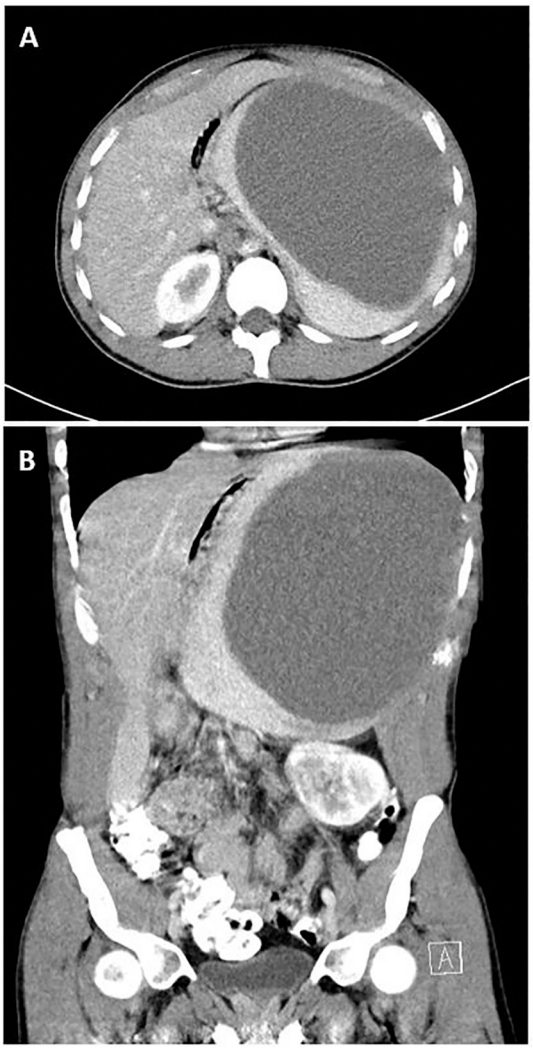

Fig. 1. CT scans of the abdomen.
(A). Axial view of the large hypodense cystic lesion (11 $\times$ 17 $\times$ 17 cm) in the spleen.
(B). Coronal view showing the displacement of the stomach and left kidney.

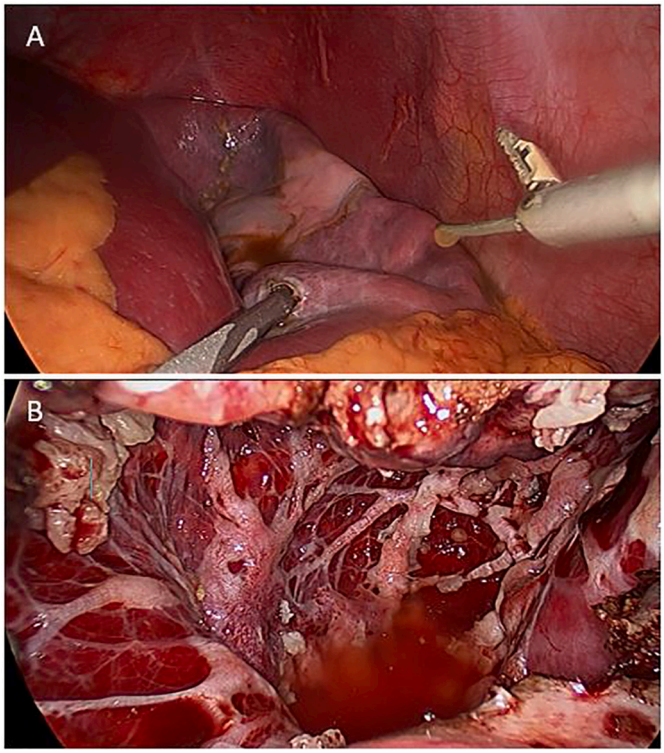

Fig. 2. Intraoperative view of the splenic cyst.
(A). Laparoscopic exploration and drainage of the cyst after initial incision.
(B). Interior sight of the splenic cyst and remnant of fluid after laparoscopic fenestration.

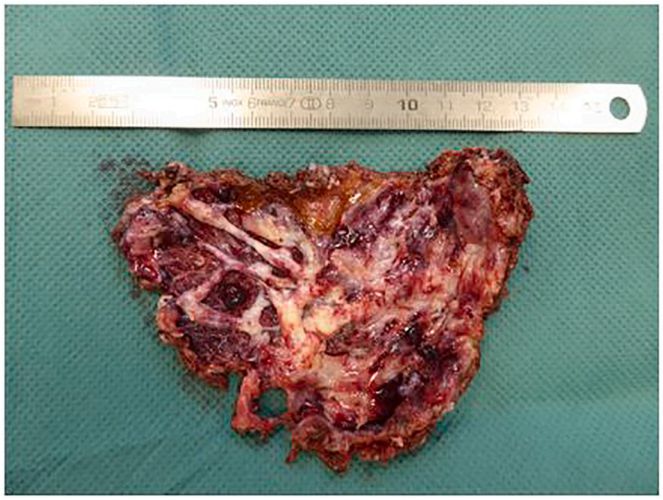

Fig. 3. Tissue excisate of laparoscopic fenestration.
The tissue excisate showing the irregular inner surface with the trabecular structure and knobby consistency.

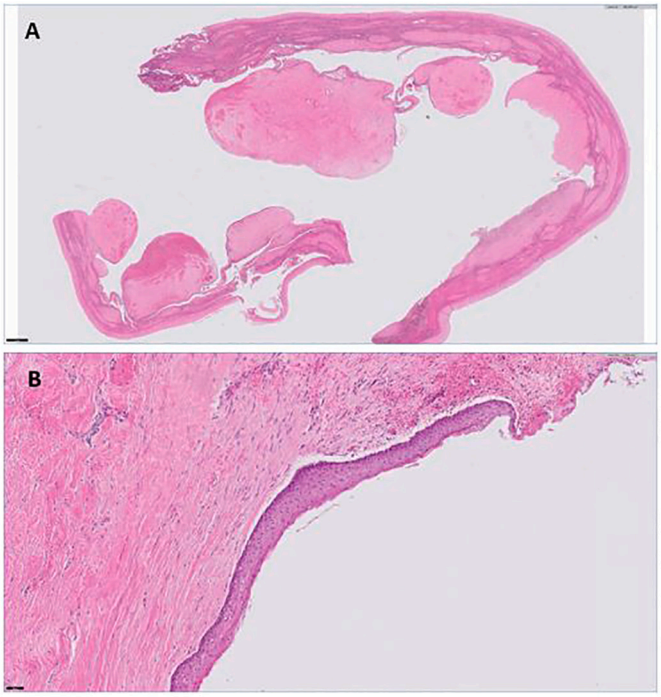

Fig. 4. Histopathological examination of the splenic cyst.
(A). Microscopic view of the sectioned cyst wall (Haematoxylin & Eosin staining, scale bar = 1 mm).
(B). The squamous epithelial lining of the cyst wall (Haematoxylin & Eosin staining, scale bar = 50 μm).

or by ultrasound [9,10], larger cysts can present with symptoms such as nausea, vomiting, upper abdominal pain, chest pain, dysphagia or dyspnea [5,11,12]. Thrombocytopenia, which was observed in our patient, is also described in some cases [13,14].

Due to possible complications such as spontaneous rupture, haemorrhage or secondary infection [15,16], it is generally suggested that larger cysts over five centimeters are suggested to be treated surgically [5].

The surgical technique should be chosen depending on the location of the cyst in the spleen (peripheral/hilar), size and occupation of splenic parenchyma and the patient's comorbidities [15,17,18]. Laparoscopic spleen-preserving procedures such as fenestration and marsupialization should be selected primarily [15,17,18], however they are accompanied by higher recurrence rates than partial or total splenectomy [19–21].

4. Conclusion

Nonparasitic splenic cysts are a rare encounter. While larger cysts present with unspecific and upper GI-symptoms, smaller cysts are usually diagnosed incidentally by ultrasound or CT scans. To relieve pain and prevent the occurrence of complications, large cysts are treated with a surgical regiment. Restrictive, spleen-preserving procedures are preferred. If treated cysts reappear, partial or total splenectomy is often the remaining therapy option.

Consent

The patient and his legal guardian gave verbal and written informed consent for the publication of this case report and related images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Case presentation disclosure

The authors disclose that this case report has not been published previously or under consideration for publication elsewhere. The publication is approved by all authors.

Ethical approval

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Guarantor

Robert Rosenberg, Chief of Surgery, Kantonsspital Baselland, Liestal, Schweiz (robert.rosenberg@ksbl.ch).

Research registration number

This case report does not underlie the definition of a clinical trial as defined by the Ordinance on Clinical Trials in Human Research, which means that no registration for First in Man case report is required.

CRediT authorship contribution statement

Alina Samia Senn: Conceptualisation and design, data collection and interpretation, writing the paper
Robert Christian Bauer: Conceptualisation, data collection and interpretation
Andres Heigl: Conceptualisation, design and supervision
Robert Rosenberg: Conceptualisation and design, supervision, final approval of the paper.

Declaration of competing interest

The authors indicated no potential conflict of interest related to this manuscript.

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