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Clinical case presentation

PARTIAL SPLENECTOMY AS THE METHOD OF CHOICE FOR THE SURGICAL TREATMENT OF GIANT SPLENIC HYDATID CYST

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Abstract

Primary location of hydatid cysts in spleen is a rare case in clinical practice. The hydatid cysts in spleen may often be asymptomatic and lead to growing giant size before being recognized. Surgery is the main treatment of hydatid disease of the spleen and several surgical techniques are applied to splenic echinococcosis. Splenectomy remains the therapeutic procedure of choice as it offers the complete cure of the disease with low morbidity rate and short hospital stay. Although the preservation of the spleen is being increasingly advocated to prevent some complications associated with splenectomy.

In presented clinical case partial splenectomy was performed with good postoperative results. A 18-year-old woman presented with complaints of the presence of a large mass in the abdomen. She had been asymptomatic until 3 months before. Diagnosis was based on imaging techniques, including ultrasound examination and computed tomography. Contrast computed tomography scan revealed huge solitary cyst (size 24×17×14cm) in the hilum and lower pole of spleen without changing its density in different contrasting phases. The cyst was compressing the inner organs. During the surgery the splenic vessels were dissected and ligated in the part of hilum, then the cyst was separated from the adhesions surrounding the internal organs. Branches of the short blood vessels of stomach, supplying blood to superior pole of the spleen were preserved. Approximately 4×3cm spleen tissue was preserved in the upper pole. The patient had no postoperative complications. Five months after surgery the patient was observed. She had no complaints; blood tests were within normal limits. Ultrasound examination revealed spleen tissue with the size of 6.5×4.5 cm in the left infraphrenic space. The duplex scanning showed sufficient blood supply of the preserved spleen. The use of modern imaging modalities makes it possible to identify the contiguity of the hydatid cyst with other internal organs and to choose the most optimal surgical treatment for each case. An organ-preserving approach as partial splenectomy seems favourable in some individual cases. Partial splenectomy may often be related to a considerable blood loss; thereafter particular vascular control should be establishedduring parenchymal transection.

Keywords. *partial splenectomy, echinococcosis, giant hydatid cyst.*

Introduction

Primary location of hydatid cysts in spleen is a rare case in clinical practice even in endemic foci of echinococcosis. According to recorded medical data, anterior position of spleen hydatid cyst makes up 0.9-8% of all cases of echinococcosis and 0.5-4% of cases of intra-abdominal echinococcosis [*Ben Ameur H et al., 2015*]. More rare liver lesions are conditioned by the peculiarities of echinococcal infection mechanism. Splenic lesion occurs only when embryos of echinococcus overcome hepatic and pulmonary barrier through blood circulation and settle in spleen. Retrograde lesion from the liver to the portal or through the spleen vein is also possible [*Fernández-Ruiz M et al., 2008*]. As

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a result of slow growth of parasitogenic cyst, spleen echinococcosis might have no clinical manifestations for a long time and be revealed only when of a giant size. The main clinical symptoms of spleen echinococcosis are dull abdominal pain and palpable tumor in the left subcostal area. Main complications of spleen hydatid cyst are suppuration, formation of fistulas with adjacent viscera, cyst rupture with accompanying anaphylactic shock, compression of inner organs (stomach, transverse colon), renal vein constriction [*Teke Z et al., 2008; Kantarçeken B et al., 2010; Arce M et al., 2016*]. Diagnosis of spleen echinococcosis usually doesn't make any difficulty; the main diagnostic methods are ultrasound investigation of abdominal cavity, computed tomography (CT) and serological tests. Application of laboratory and instrumental methods allows to confirm the diagnosis in 90% of cases, sometimes it is hard to differentiate between epithelial cysts and 1st degree echinococcal cysts. Various methods of surgical intervention such as total splenectomy in couple with cyst, cyst marginal resection (precystectomy, fenestration), cyst puncture with cystic content aspiration etc. are nowadays used to treat spleen echinococcosis, depending on the number of cysts, their type, location and size. The mentioned surgical methods have both advantages and drawbacks. Total splenectomy maximally decreases the probability of echinococcosis recurrence, and the absence of residual cavity shortens the patient's treatment period. However, splenectomy is frequently accompanied by intraoperative complications, as well as absence ofspleen certainly has negative effect on the immune system of the organism. Postoperative sepsis and severe pneumonia are complications after splenectomy which are more frequently observed in children and teenagers [*Ellison E, Fabri P, 1983; Safioleas M et al., 1997; Dar M et al., 2002*]. Taking into consideration abovementioned unfavorable complications, at present total splenectomy is indicated only in case the cysts are either multiple, close to spleen hilum or are located deep in the tissue [*El Malki H et al., 2006; Ousadden A et al., 2010*]. Total splenectomy is performed in case of giant hydatid cyst which occupies almost the whole organ volume i.e. more than 75% of parenchyma [*Ben Ameur H et al., 2015*]. Several cases of splenic tissue transplantation are reported in medical literature. Splenic tissue 1-2cm^3 in size is usually used for transplantation. It is placed in post-peritoneal area or large mesentery. This method is, however, not widely used, as transplanted tissue atrophy often occurs [*Scher K et al., 1985; Traub A et al., 1987; Riera M et al., 2009*]. Marginal resection of cyst is rarely accompanied by severe intraoperative complications. It is organ-preserving surgery and is more easily performed using laparoscopy.

Marginal resection is possible if the cyst has superficial location. Disadvantages of this type of surgery include more frequently observed echinococcosis recurrence as well as presence of residual cavity that promotes frequent postoperative infectious complications (suppuration of residual cavity) and is a subject to long-term treatment. Data on laparoscopic fenestration and marginal resection of hydatid cyst of the spleen are yet scarce in medical literature. The widespread use of the given method is restricted by the high probability of echinococcosis recurrence [*Polat F et al., 2009; Vasilescu C et al., 2010*]. Puncture of hydatid cyst, content aspiration and antiparasitic treatment of cavity are more rarely performed. This is less invasive method, however having high recurrence probability. Puncture is mainly performed in patients at high risk of surgery and presence of multiple small cysts in various inner organs. Partial splenectomy is practically the most preferable surgical method, as it minimizes the risk of echinococcosis recurrence and growth, preserves the functions of the spleen thus preventing complications due to its total resection.

Material and methods

The patient, 18-year-old female, was admitted to the Department of Surgery of Yerevan Garrison Military Hospital on 12.09.2018 with complaints of constant dull pain and presence of palpable tumor in the left half of the abdomen. The patient had been complaining of the symptoms for two years. Over this period the growth had gradually increased in size. On objective examination, the abdomen was asymmetrical in the left half due to the presence of oval tumor of elastic consistency, with smooth edges and mild pain on palpation.

Routine pre-operative physical examinations, laboratory and instrumental studies were made (blood tests, chest X-ray, electrocardiogram, ultrasound abdomen investigation etc.). The diagnosis was generally based on imaging techniques, including ultrasound examination and enhanced contrast CT (Toshiba Aquilion, Japan).

The patient underwent elective surgery on 20.09.2018 under general anesthesia via endotracheal intubation. Midline laparotomy was performed. The main stages of surgery included the examination of abdominal cavity, dissection of spleen vessels, separation of cyst adhesions from adjacent inner organs and abdominal wall, resection of spleen tissue and control of bleeding from the spleen wound.

Results

The results of laboratory and instrumental studies: The results of complete blood count,biochemical analysis of blood and urine test were within normal limits. Electrocardiogram and chest X-ray examination didn't reveal any pathological deviations.

Ultrasound investigation of abdominal cavity: The results showed that the spleen was enlarged in size 20 ×8.0 *cm*, Giant cystic neoplasm of oval shape 24 ×23 *cm* in size with heterogeneous content was revealed in hilumregion. No abnormalities were found in other organs.

Contrast enhanced computed tomography of abdominal cavity: The results showed subcapsular hypodense cystic neoplasm 235×173×144 *mm* in size, with smooth edges, of up to 20 *HU* density, which remained unchanged in different contrast phases was revealed in spleen parenchyma (Fig. 1). Neoplasm content was multicellular closer to parenchyma; the rest of spleen tissue was of a normal structure. Neoplasm was adjacent to anterior abdominal wall on the left and front, adjoining to

*Figure 1. Enhanced contrast computed tomography of abdominal cavity: cross-section (**A**), longitudinal section (**B**)*

Figure 2. After midline abdominal incision was performed, a giant cystic neoplasm was found in abdominal cavity.

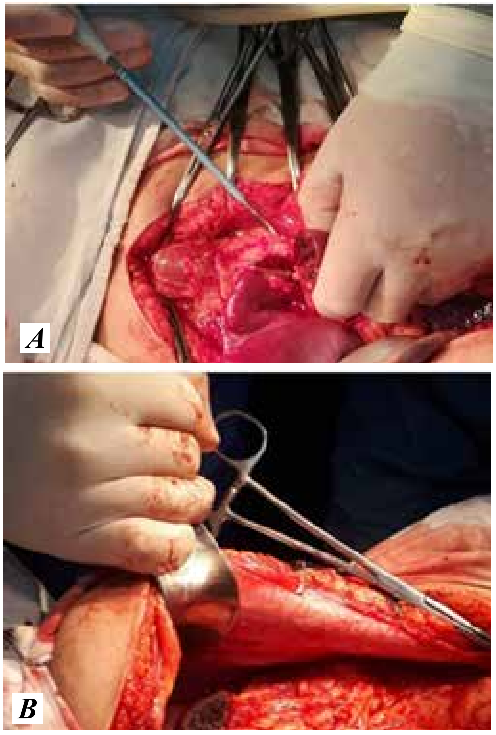

Figure 3. Resection of the spleen, preserving vascular tissue of the upper pole. A. Resection process B. Residual tissue of upper pole of the spleen

Figure 4. Hemostatic sponge is being placed on resected spleen wound surface.

FIGURE 5. Removed macropreparation

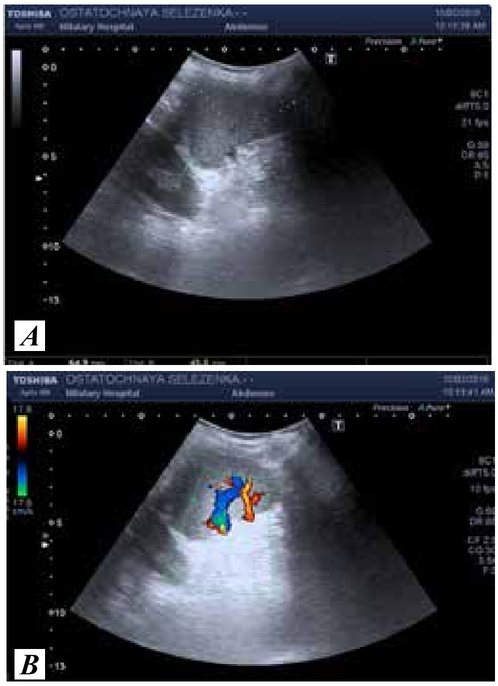

FIGURE 6. Duplex ultrasound investigation of abdominal cavity made five months after the surgery. A. Accessory spleen B. Blood supply to accessory spleen

the left lobe of the liver, stomach and pancreas on the right, to the left kidney from behind, with abdominal aorta dislocation to the right.

Abdominal cavity examination: Cystic neoplasm was located mostly in the lower pole and hilum of the spleen. It occupied the whole left portion of the abdominal cavity, epigastric and mesogastric regions, with the lower border of cystic neoplasm located in the pelvis (Fig. 2).

Surgical intervention on spleen: Neoplasm was separated from adhesions to adjacent inner organs. Due to giant size of neoplasm, the content was aspirated and afterwards only it was possible to take the spleen and neoplasm out of the surgical wound. The splenic vein and artery, which were cut in the hilum of the spleen, were differentiated and tied off. In partial splenectomy, short gastric arteries which supply blood to the upper splenic pole were preserved. Splenic tissue 4 ×3 *cm* in size at the upper pole of the spleen which was nourished by the short gastric arteries (aa. et vvgastricae brevis), was partly resected together with splenic cyst via harmonic scalpel and preserved (Fig. 3). Parenchymatous bleeding from the wound surface of the resected spleen was stopped by mean of electrocoagulation (fulguration regime) and hemostatic sponge (Fig. 4).

Subdiaphragmatic region and small pelvis were drained through silicone drainage with grooves. Removed macropreparation underwent histological examination, according the results of histological investigation it was a splenic hydatid cyst (Fig. 5).

Postoperative period was uneventful. During her repeated visit to the department five months after the surgery, the patient didn't present any complaints. The results of repeated laboratory tests were within normal limits. Laboratory analyses and instrumental studies were repeatedly made. Investigation of abdominal cavity supplemented with duplex regime revealed homogeneous splenic tissue 6.5 ×4.5 *cm* in size with sufficient vascular structure in subdiaphragmatic region and the blood circulation in the organ was not disturbed (Fig. 6).

In separate cases partial splenectomy might be the optimal method of surgical treatment in spleen echinococcosis. In preoperative period contemporary diagnostic methods allow to reveal the exact location of pathological lesion in the spleen, its relation towards the adjacent organs and anatomical structures and to choose the appropriate surgical treatment option.

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