Enlargement of accessory spleen subsequent to splenectomy associated with gastrectomy can mimic a solitary tumor: Report of a case

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Abstract　We report a case of a 65-year-old woman with an incidental about 20-mm solitary mass between the lateral segment of the left lobe of the liver and left kidney 5 years after splenectomy associated with total gastrectomy. The mass was surgically resected, and histological examination revealed it to be an accessory spleen. Small accessory spleens mostly located near the splenic hilus, but large accessory spleens are unusual after total gastrectomy with regional lymph nodes resection. The remaining accessory splenic tissue would undergo compensatory hypertrophy. Hence, the possibility of accessory spleens must be considered when an intra-abdominal mass is identified in a patient with splenectomy associated with gastrectomy.

Keyword　splenectomy, accessory spleen, α-smooth muscle actin, splenosis, feeding artery

Introduction

Laparotomy sometimes reveals accessory spleens, and their incidence is reported to be about 10–30% on autopsy [1-3]. Most (about 80%) are frequently found at the splenic hilus, in the ligaments adjacent to the greater curvature of the stomach and the major omentum. Some accessory spleens are distinct from the native spleen in that they lack a hilus and have their own separate vascular supply [1]. Typically, accessory spleens appear on CT scans as well-marginated, round masses that are smaller than 20 mm (transverse diameter ranged from 4 to 25 mm, with a mean diameter of 11.6 mm) and enhance homogenously on contrast-enhanced images [1]. Further reports suggest that accessory spleens not identified at the time of splenectomy may subsequently undergo compensatory enlargement [4-6]. These cases are mostly due to hypersplenism caused by a hematological disorder and liver cirrhosis etc.

Here, we report the case of a 65-year-old woman with previous splenectomy associated with treatment of advanced gastric cancer. She presented with an incidental about 20-mm, intra-abdominal mass mimicking a neoplastic lesion 5 years after the surgery. It was eventually diagnosed as an accessory spleen by postoperative histological examination.

Case report

A 65-year-old woman underwent curative total gastrectomy with D2 lymph nodes dissection and splenectomy for gastric cancer (U, post, pT2(subserosa)N0M0, and Stage IB,) in July 2002. She was followed-up once a month over the next 5 years after surgery. Computed tomography (CT) scans were performed twice a year during this follow-up period. In June 2007, the ninth CT scan after surgery showed an about 20 mm solitary mass between the lateral segment of the left lobe of the liver and left kidney (Fig. 1). The mass showed up as a high density lesion in the arterial phase of the contrast-enhanced CT image and washed out in the equilibrium phase. Ultrasonography (US) also showed an about 20-mm space occupied lesion consisting of homogeneous tissue in the same area (Fig. 2). Furthermore, angiography showed that the tumor-like

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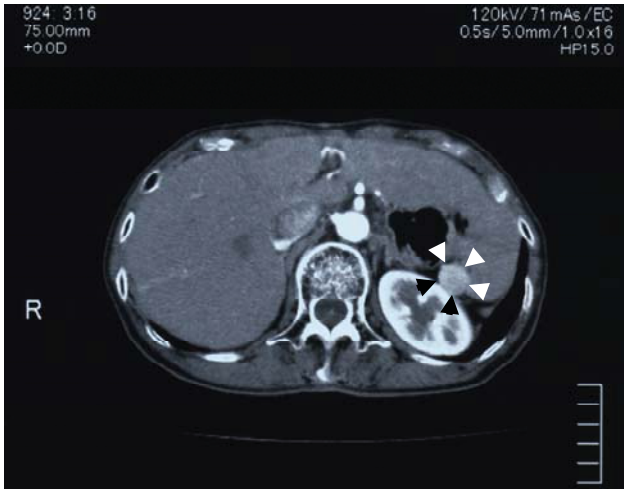

Fig. 1 Computed tomography scan.
The contrast-enhanced CT scan revealed a solitary mass (arrow head) between the lateral segment of the left lobe of the liver and left kidney.

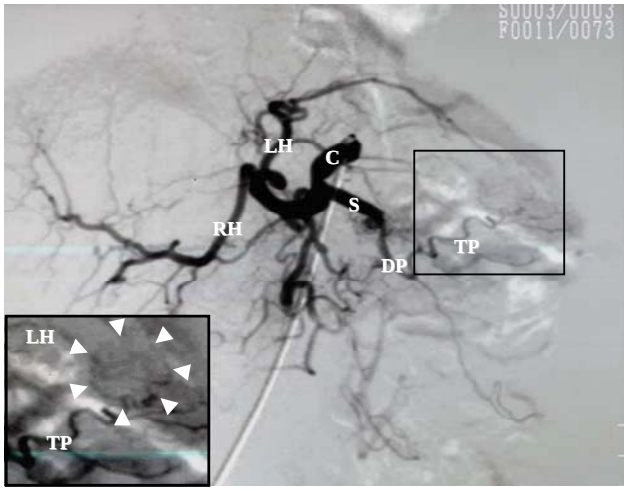

Fig. 3 Angiography.
Tumor stain (inset, arrow head) was noted, and possible feeding arteries were considered: left hepatic artery or transverse pancreatic artery. LH: left hepatic artery, RH: right hepatic artery, C: celiac artery, S: splenic artery, DP: dorsal pancreatic artery, TP: transverse pancreatic artery.

lesion was hypervascular and about 20-mm in maximum diameter. Analysing the angiography, two possible feeding arteries were considered: the left hepatic artery and a branch of the dorsal pancreatic artery (maybe the transverse pancreatic artery was also considered). Based on these radiographic and US findings, we strongly suspected the left hepatic artery to be the feeder (Fig. 3), and a diagnosis of hepatocellular carcinoma (protrude type) was made for the tumor-like lesion.

Surgery through a left subcostal approach was then performed in July 2007. The tumor-like lesion was detected by US because adhesion resulting from the

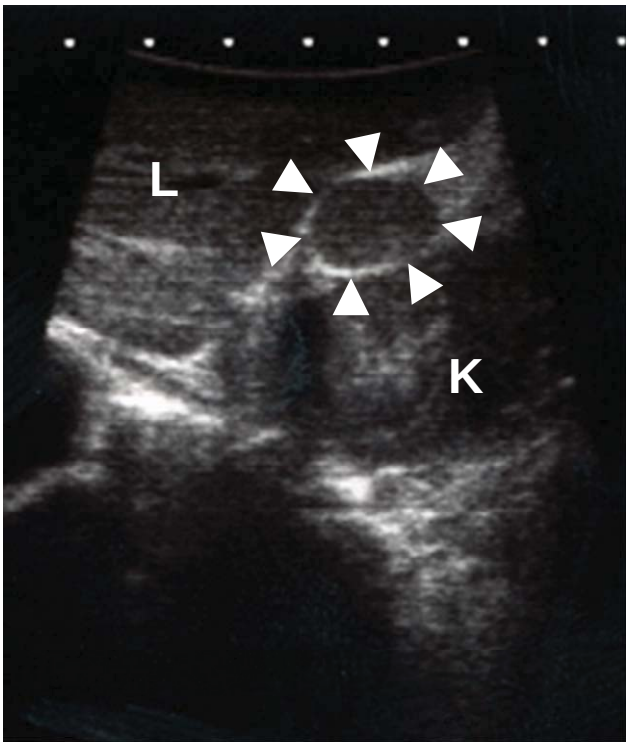

Fig. 2 Ultrasonography.
Tumor-like lesion size was about 20 mm in diameter (arrow head), encapsulated and homogenous echoic lesion. L: left lobe of the liver, K: left kidney.

previous surgery made visual examinations difficult. Contrary to what we initially suspected, the tumor-like lesion was not connected to the liver; it was actually located on the upper posterior pancreas. The tumor-like lesion was revealed to be round, soft, and deep red–purple in color on separating from pancreas, and it was connected to the splenic vein by a thick (5 mm), but short (7 mm) blood vessel (Fig. 4).

Macroscopically, the inside of the resected specimen after it had been cut in two showed to be round, 17mm in diameter and consisting of blood rich spleen-like tissue (Fig. 5). The resected specimen was slightly smaller than 20 mm because that blood supply had been shut down in the surgery. Microscopic analyses showed normal splenic red and white pulp components, including lymphoid follicles with germinal center formation, and the specimen had a thick capsule with smooth muscle elements positive for α-smooth muscle actin (α-SMA) by immunohistochemical analysis (Fig. 6A-C). These findings confirmed the lesion to be an accessory spleen.

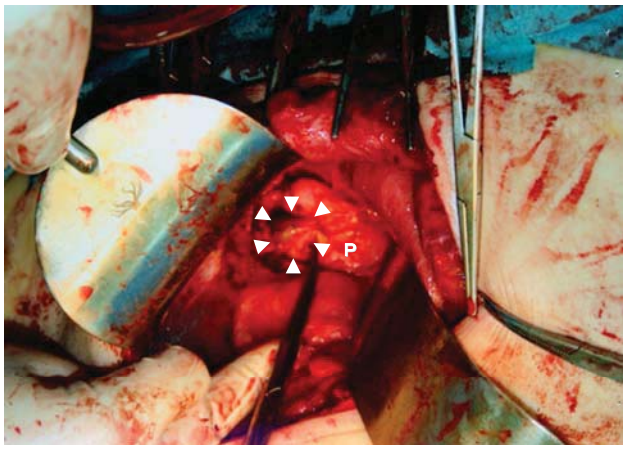

Fig. 4 Laparotomy findings.
Tumor-like lesion (arrow head) was located on the upper posterior pancreas. It was round, soft, and deep red–purple in color. P: pancreas.

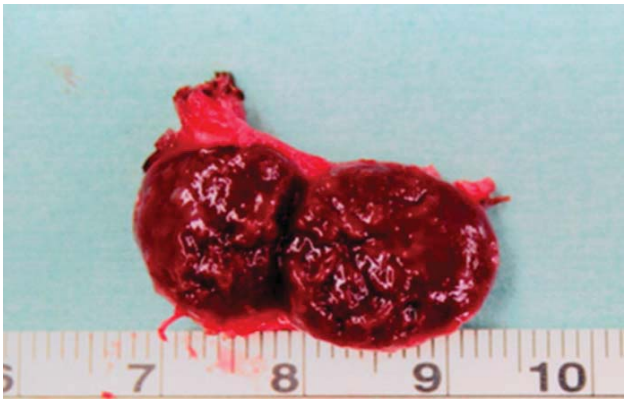

Fig. 5 Macroscopic findings of the inside of the resected specimen.
A round mass, 17 mm in maximum diameter, and consisting of blood rich spleen-like tissue was noted.

Discussion

A 65-year-old woman carried an incidental about 20-mm solitary mass between the lateral segment of the left lobe of the liver and left kidney 5 years after splenectomy associated with total gastrectomy. We did not consider the possibility of the present tumor-like lesion being an accessory spleen while performing the surgery. The mass was surgically resected, and histological examination revealed it to be an accessory spleen.

It would be occasionally difficult to distinguish accessory spleen from splenosis. The possibility of splenosis must be acknowledged, even if splenosis is unusual after splenectomy without trauma. Splenosis is the autotransplantation of splenic tissue, and usually occurs following traumatic rupture of the spleen. The lesions can be multiple and very small, ranging from a few millimeters to several centimeters, and could enlarge after splenectomy [7-9]. Histologically, splenosis is not encapsulated nor does it usually present with smooth muscle elements and supply vascular branches arising from the splenic artery. In contrast, accessory spleens are encapsulated with the smooth muscle elements, which is similar structure of normal spleens [1, 10]. In this case, we identified smooth muscle elements in the capsule of the resected specimen using immunohistochemical staining of α-SMA. Furthermore, angiography indicated a feeding artery (TPA; one of the branches of splenic artery) in the intra-abdominal mass. These findings revealed the resected specimen to be accessory spleen rather than splenosis. We highly suspect the accessory spleen to have been extremely small at the time of the original surgery for the treatment of gastric cancer, and believed it to have enlarged due to compensatory hypertrophy after splenectomy.

We highly suspected hepatocellular carcinoma as well as islet cell tumor and carcinoid on preoperative differential diagnosis. Diagnosing accessory spleen with CT scans and US is feasible in cases where the spleen is still present because its margin and density can be evaluated. However, in this case, CT scan and US did not provide a conclusive diagnosis, and percutaneous tissue biopsy was deemed imprudent. It has been reported that radionuclide imaging with technetium sulfur colloid, which can identify accessory splenic tissue, is reasonable to perform in patients who have had previous splenectomy, and in instances where accessory spleen is suspected [11]. In addition, accessory spleen has been correctly diagnosed by noninvasive techniques such as 99mTc-heat-damaged red blood cell and single photon emission computed tomography [12]. However, these techniques

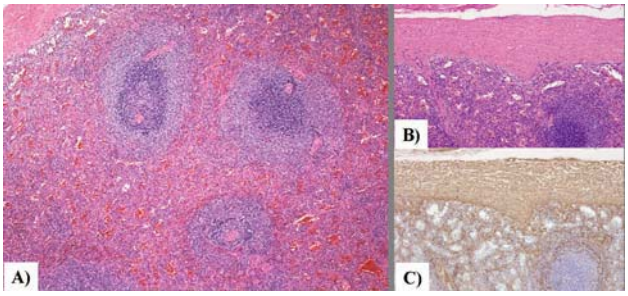

Fig. 6 Microscopic findings.
The nodule was composed of lymphoid follicles and splenic pulp (A, B), and it had a capsule with smooth muscle elements positive for α-SMA (C). A) Hematoxyline and eosin (HE) staining (lower magnification), B) HE staining (higher magnification), C) Immunohistochemical staining of α-SMA.

offer far inferior anatomic resolution compared with CT or MRI (magnetic resonance imaging), thus increasing the likelihood of misdiagnosis [13]. Superparamagnetic iron oxide-enhanced MRI and Levovist-enhanced US, the mechanisms of which are theoretically similar to that of 99mTc scintigraphy, can also be used as alternative tools to confirm the diagnosis of accessory spleen [14, 15].

Taking all these findings into account, we present a case of accessory spleen, which was incidentally discovered during follow up after total gastrectomy due to gastric cancer. When an intra-abdominal mass is identified in a postsplenectomy patient, even if after lymph nodes dissection associated with gastric cancer, accessory spleen must be acknowledged as a differential diagnosis, and more specific examinations should be performed to obviate unnecessary laparotomy.

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