Hand-Assisted Laparoscopic Splenectomy for Splenic Hemangioma

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ABSTRACT
A 53-years-old female was admitted to the hospital for investigation of a splenic tumor. After imaging studies, splenic vascular tumor was suspected. However, the possibility of a malignant neoplasm could not be ruled out preoperatively. Hand-assisted laparoscopic splenectomy was safely performed for the diagnosis and treatment of the splenic tumor. The histologic diagnosis was hemangioma. In conclusion, hand-assisted laparoscopic splenectomy should be performed in patients with splenic vascular tumors since the lesion could be a malignant neoplasm.

Key words: Spleen, Hemangioma, Hand-assisted laparoscopic splenectomy

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ÖZET
Splenik Hemanjiyoma için El-Yardımlı Laparoskopik Splenektomi

Anahtar kelimeler: Dalak, Hemanjiyoma, El-yardımlı laparoskopik splenektomi

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INTRODUCTION
Splenic hemangioma is a rare disorder but remains the most common benign neoplasm of the spleen. This lesion is usually asymptomatic and discovered on cross-sectional imaging studies[1,2]. Although imaging studies are helpful for the diagnosis and evaluation of pathologic conditions of the spleen, splenic vascular tumors, whether malignant or benign, can be difficult to diagnose pre-operatively[3-5]. Therefore, splenectomy is generally necessary from both
diagnostic and therapeutic aspects in patients with splenic vascular tumor[2-4].

Laparoscopic splenectomy was primarily developed for benign hematologic disease. It is technically safe with several advantages over open splenectomy[6]. The hand-assisted laparoscopic splenectomy (HALS) is an evolution of the laparoscopic procedure. The use of the hand allows easy exposure, complete exploration, meticulous dissection, and immediate hemostasis[7-10]. This report describes a patient with splenic vascular tumors that were successfully treated by HALS.

CASE REPORT
A 53-years-old female was admitted to the hospital with left upper quadrant pain. Her medical and family history was otherwise unremarkable. Her vital signs on admission were: blood pressure 110/75, pulse 72 and rectal temperature 36.8°C. The physical examination and laboratory investigations were unremarkable. The peripheral blood count revealed a hemoglobin level of 10.5 g/dL, hematocrit value of 33%, platelet count of 110,000/mm³, and white blood count of 7000/mm³. The liver function tests were within the normal ranges. Chest X-rays were unremarkable.

Enhanced computed tomography (CT) scan revealed a large, ill-defined hypodense lesion expanding the spleen (Figure 1A). The T2-weighted images demonstrated a lesion measuring 10 x 9.5 x 8.5 cm with well-defined margins and solid and multiple cystic components, slightly hyperintense compared to the spleen (Figure 1B). The lesion had a close relationship with the left adrenal gland but there was no sign of invasion. On pre-contrast Flash 3D images, the lesion was hypointense (Figure 1C). On post-contrast images, the lesion demonstrated peripheral nodular enhancement (Figure 1D).

HALS was performed because the possibility of a malignant neoplasm could not be ruled out pre-operatively. The intra and post-operative course was uneventful. The duration of surgery was 55 minutes and the intraoperative blood loss was 45 g. The weight of the spleen was 640 g and it measured 15 x 12 x 11 cm. The cut surface showed a relatively centrally placed, hemorrhagic and thrombotic semicystic lesion measuring 9 x 3 x 2 cm. The surroun-
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Figure 1. (A) Enhanced CT scan revealed a large, ill-defined hypodense lesion; (B) the T2 weighted images demonstrated a lesion with well defined margins and solid and multiple cystic components, slightly hyperintense compared to the spleen; (C) the lesion had a close relationship with left adrenal gland but no sign of invasion was present. On pre-contrast flash 3D images the lesion was hypointense; (D) on post-contrast images, the lesion demonstrated peripheral nodular enhancement.

Figure 2. (A) The cut surface showed relatively centrally placed, hemorrhagic and trombotic semi-cystic lesion measuring 9 x 3 x 2 cm. (B) Central areas of the lesion showed frankly dilated vascular spaces filled by organizing trombus and the surrounding peripheral tissue revealed infarctoid changes and reactive pseudo-capsular reaction (haematoxylin and eosin, original magnification).
DISCUSSION

The spleen is the largest ductless gland and the largest single lymphatic organ in the body. A wide range of diseases can affect the spleen. Pathologic conditions of the spleen were reported as congenital diseases, trauma, inflammation, vascular disorders, hematologic disorders, benign tumors, and malignant tumors\(^1,2\). Hemangioma is the most common primary benign neoplasm of the spleen and is composed of endothelium-lined vascular channels filled with blood. Splenic hemangiomas are believed to be congenital in origin, but they are usually discovered in adulthood. The hemangiomas are divided into capillary and cavernous types, based on the size of the channels. The lesions may be solitary or multiple. On gross examination, it can be identified from the surface as a more intensely blue/purple area, darker than the normal splenic pulp. The patients are often asymptomatic, but spontaneous rupture has been reported to occur in as many as 25\% of this patient population. Splenic hemangioma may be isolated or associated with other skin, skeletal, or visceral vascular anomalies\(^2,3\).

The ultrasonography appearance of hemangiomas is non-specific. Lesions may be well-margined and predominantly hyperechoic with occasional calcifications or cysts, depending on the size of the vascular channels\(^3,5\). Findings on unenhanced CT reflect histopathologic findings. Solid areas may be hypo- or isoattenuating relative to normal splenic tissue. The predominantly cystic lesions are avascular, and only the solid components enhance. Calcification may demonstrate a linear or mottled appearance\(^2,3,5\). Magnetic resonance imaging (MRI) findings are also similar to those in liver hemangiomas. The lesions are hypo- or isointense on T1-weighted images and hyperintense on T2-weighted images relative to normal splenic tissue. Calcium, cysts, necrosis, or fibrosis results in atypical patterns on MRI, as in our patient\(^3,5\). Although imaging techniques have

Figure 3. (A) An incision was made in the right subcostal region, and the hand-assisted device was installed; (B) the omental branches of the gastroepiploic artery were divided; (C) and then the short gastric vessels were identified and divided; (D) at the splenic hilum, the splenic artery and vein were dissected with the Endo GIA vascular linear cutting Stapler.
aided in the identification of the splenic vascular tumor, a final diagnosis could only be obtained through postoperative pathologic investigation. Therefore, splenectomy is generally necessary from both diagnostic and therapeutic aspects in patients with splenic vascular tumor[2-5].

Laparoscopic splenectomy has been shown to be a safe procedure, resulting in short hospital stays, low post-operative pain scores and good post-operative outcomes[6]. Recently, HALS has been reported to be safe and indicated for splenic malignancies as well as benign tumor or large spleen, because intact specimen removal may be expected with both the inspection with laparoscopy and palpation of the tumor, as in open surgery[7,8]. The tactile sense may help identify dissection planes, define accessory spleens, and prevent splenic capsular injury by trocars and instruments. The dissection of the splenic hilum is easier with the tactile sense of the hand while maintaining the benefits of a minimally invasive procedure[7-10].

In our case, HALS was performed because the possibility of a malignant neoplasm could not be ruled out preoperatively. This method combines the advantages of both open and laparoscopic techniques. In conclusion, HALS may be a good option for splenic vascular tumors, whether malignant or benign, that are difficult to diagnose pre-operatively.

REFERENCES

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