Laparoscopic Resection of a 12 cm Sized Retroperitoneal Schwannoma Adjacent to Retroperitoneal Vital Vessels: Are Large Retroperitoneal Schwannomas Not Suitable for the Laparoscopic Approach?

There are a lot of advantages to laparoscopic surgery, including early recovery, less postoperative pain, better cosmesis, shorter hospital stay and an early return to normal activities because of its minimal invasiveness. So, most surgeons have agreed on these points and have accepted the various indications for laparoscopic surgery. Despite these advantages and the recent advances in laparoscopic surgery, there are few cases using the laparoscopic approach for treating retroperitoneal schwannomas. Laparoscopic resection of a large retroperitoneal schwannoma has some difficulties for tumor retraction, dissecting around the large vessels, and removal of the resected tumor. Sometimes these difficulties may cause complications and a lengthened hospital stay. However, if appropriate methods are used, long hospital stay and complication can be prevented while maintaining the advantages of laparoscopic surgery. (J Korean Surg Soc 2010;78:253-257)

Key Words: Schwannomas, Retroperitoneum, Laparoscopic resection

INTRODUCTION

Schwannomas are neurogenic tumors that originate from the schwann cells of peripheral nerve sheaths. Most of them occur in the head and neck, but they are rarely seen in the retroperitoneum. Retroperitoneal schwannomas are generally slow-growing and they can grow to a large size before producing symptoms. Because there are no pathognomonic radiologic findings, making the definite preoperative diagnosis is difficult to do. The treatment of choice for these tumors is complete surgical resection. To date, a conventional open procedure has been used, but laparoscopic approaches are increasingly being applied as a result of the recent advances in laparoscopic surgery. We recently experienced a case of a 12 cm sized retroperitoneal schwannoma that was located adjacent to large vessels. It was successfully treated by laparoscopic surgery without any postoperative complications or extended hospital stay, so we report here on this case along with a review of the relevant literature.

CASE REPORT

1) Patient

A 73-year-old female was referred to us with indigestion and early satiety. Her past history and family history were unremarkable. Her abdomen was soft on physical examination, but a firm, non-tender mass was palpable in the left upper quadrant of the abdomen. The horizontal section of computed tomography demonstrated a 12×10 cm well-defined, encapsulated mass that had an internal cystic...
component and the mass was located adjacent to the superior mesenteric artery and celiac trunk (Fig. 1A, B). On the coronal section of computed tomography, the mass was located adjacent to the splenic vein, the left renal vein, and the abdominal aorta (Fig. 1C). Ultrasonography-guided fine-needle aspiration biopsy was done and the mass was diagnosed as a benign retroperitoneal schwannoma. Based on the preoperative pathologic finding the patient underwent laparoscopic excision and she discharged on the postoperative 4th day without any complication. A permanent histopathologic examination revealed the mass to be a benign schwannoma (Fig. 2).

2) Surgical technique

Under general anesthesia, the patient was placed in a supine position with the legs separated. The operator stood on the patient’s right, the first assistant stood on the patient’s left and the camera operator stood between the patient’s legs. A 10-mm trocar is inserted through a subumbilical incision with an open technique and a pneumoperitoneum was established. Four other trocars (One 12-mm trocar and three 5-mm trocars) were placed. The dissection began with omentectomy from the splenic flexure to the mid-transverse colon. After exposing the anterior surface of the mass, we dissected the tumor from the surrounding tissue along an avascular plane (Fig. 3A). The tumor was easily divided from the surrounding tissue and it was well enveloped by dense connective tissue that made the retraction easier (Fig. 3B). A careful dissection was performed during dissecting near the large vessels. Several feeding arteries from the aorta and drainage veins to the splenic vein were identified and these were securely ligated using laparoscopic endoclips. After complete resection and inserting the tumor into a retrieval bag, tumor removal was performed as described below. We extended the umbilical incision vertically about 3 cm in length (Fig. 3C), a wound protector was inserted and the abdominal skin was draped using a sterile tower. The tumor has a cystic portion, so fluid aspiration was performed to reduce the tumor’s size. Then we divided the tumor into two fragments in a retrieval bag and then we removed them. After complete tumor removal, we exchanged all the surgical instruments. One closed suction drain was placed into the surgical field through the 5 mm left lower trocar. The operation time was 205 minutes, and the blood loss was 75 ml.

DISCUSSION

Retroperitoneal schwannomas are rare and they account for 0.7% to 2.7% of all schwannomas. These tumors are usually asymptomatic and discovered incidentally. But sometimes they can grow to a large size and produce

Fig. 1. Abdominal CT findings. The image shows a 12×10 cm sized retroperitoneal tumor (A). The horizontal section view demonstrates a well-defined, encapsulated mass that has an internal cystic component. The mass is located adjacent to the superior mesenteric artery and celiac trunk (B). On the coronal section view, the mass was located adjacent to the splenic vein, left renal vein, and abdominal aorta (C).
symptoms due to a mass effect.

Because of the pathologic variations of this tumor and the lack of pathognomic radiologic findings, making a definite preoperative diagnosis of retroperitoneal schwannoma is difficult. But sometimes a preoperative pathological diagnosis can be made by ultrasonography or computed tomography guided needle biopsy. In addition, radiological imaging is helpful for treatment planning because it provides information about a tumor’s size and location and its anatomical relationship with the retroperitoneal large vessels, and the possible tumor invasion to other structures.

The treatment of choice for retroperitoneal schwannomas is complete surgical excision. A conventional open procedure has been traditionally used for resection of retroperitoneal schwannomas, but the laparoscopic approaches are increasingly being applied. This is due to the many advantages of laparoscopic surgery, including early recovery, less pain, good cosmesis, a short hospital stay and an early return to normal activities because of its minimal invasiveness. However, there have been discouraging opinions about using the laparoscopic approach to treat large retroperitoneal schwannomas such as the extended hospital stay and the technical difficulty.

To the best of our knowledge, 15 cases of retroperitoneal schwannomas treated by laparoscopic surgery have been reported in the English medical literature. For these cases, the tumor mean size was 4.8 cm (range: 2 ∼ 8 cm)
at the maximum diameter and the mean hospital stay of
the 13 cases that specified the duration of the hospital stay
was 6.8 days (range: 1~18 days). When comparing the
duration of the hospital stay according to tumor size, the
mean hospital stay was 8.9 days when the tumor size was
over 5 cm and it was 3.3 days when the tumor size was
less than 5 cm. Thus, the hospital stay was significantly
longer when the tumor size was over 5 cm (P=0.0048). For
this reason, some investigators have suggested that large
retroperitoneal schwannomas are not suitable for the
laparoscopic approach. They suggest that a large retro-
peritoneal schwannoma may be managed effectively by
conventional open surgery in terms of a reasonable post-
operative hospital stay, and a shorter hospital stay was also
noted in a recent report on a large retroperitoneal schwan-
nomata that was treated by the open approach.(5,19)

Technically, laparoscopic resection of a large retro-
peritoneal schwannomas has some difficulty for tumor
retraction, dissecting around large vessels, and removing
the resected tumor. However, retroperitoneal schwannomas
are well circumscribed, they rarely invade to adjacent organs
and large vessels, and they enveloped by dense connective
tissue which makes retraction easier.(18) So, if great care
taken during dissecting near the large vessels, the laparo-
scopic approach for a large retroperitoneal schwannomas
can be performed safely.

When a large retroperitoneal schwannoma is resected via
laparoscopic surgery, extending an incision is necessary for
removing the tumor. However, the extension of the inci-
sion reduces the advantages of laparoscopic surgery and it
also makes the hospital stay longer. Considering that there
were no postoperative complications in all the previous
reported cases, we can presume that extension of the incision
was one causes of the longer hospital stay for the
patients whose tumor was 5 cm or larger. However, if
proper methods are used (protect the wound and the skin
to prevent seeding of tumor cells, divide the tumor into
two pieces in the lap-bag before remove it, and change all
the surgical instruments after the extraction), then excess-
vously extending the incision can be avoided and conse-
quently, a long hospital stay can be prevented while
maintaining the advantages of laparoscopic surgery.

We experienced a case of a 12 cm sized benign retro-
peritoneal schwannoma that was located adjacent to the
great vessels, and this was successfully treated by laparo-
scopic surgery without any postoperative complications or
an extended hospital stay. This case suggests the indications
for laparoscopic surgery can be widened to include treating
large retroperitoneal schwannomas.

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