

## Laparoscopic Management of Suprarenal Leiomyosarcoma: A Case Report

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### ABSTRACT

The present report is a case of successful resection of a retroperitoneal leiomyosarcoma using laparoscopic surgery. There are few cases of this kind reported in the literature. The vast majority of patients have open surgery when the tumors are at an advanced stage. The patient is a 36-year-old man who presented with right upper abdominal pain. Evaluation by imaging studies led to the diagnosis of a retroperitoneal tumor (7.5 cm in diameter) above the right kidney. Laparoscopic surgery was performed. Histopathologic examination of the resected specimen showed a totally excised leiomyosarcoma. At a 10-month follow-up, the patient was disease-free and doing well. The results show that laparoscopic excision of a retroperitoneal leiomyosarcoma tumor can be applied safely and successfully as a minimally invasive procedure.

### INTRODUCTION

Retroperitoneal leiomyosarcoma, one of the soft-tissue sarcomas, is relatively rare and comprises < 1% of all malignancies [1]. Approximately 70% of all leiomyosarcomas are found in the retroperitoneal region [2]. Although leiomyosarcoma is among the most common nonepithelial retroperitoneal tumors (along with fibrosarcoma, liposarcoma, and malignant lymphoma), it only comprises 5% to 15% of all retroperitoneal tumors [2]. Usually, retroperitoneal leiomyosarcoma presents with nonspecific clinical signs and symptoms. Extensive surgical resection is the treatment of choice, to achieve complete removal and provide negative surgical margins. These are the most important factors in preventing local recurrence [3].

Laparoscopic surgery has gained wide acceptance for the management of retroperitoneal tumors because of its minimal invasiveness [4]. The reported benefits of laparoscopic surgery

include decreased operative blood loss, reduced requirement of analgesics, and a shorter hospital stay and recovery time. The present report is a case of successful and safe resection of a retroperitoneal leiomyosarcoma via laparoscopy, even though the tumor was attached to the liver with hard adhesions.

### CASE REPORT

A 36-year-old male presented to the authors' hospital complaining of right upper abdominal pain. Physical examination was unremarkable. The results of laboratory evaluation were within normal limits. Hormonal examination was normal.

Computed tomography (CT) and ultrasound of the abdomen confirmed a large mass close to the liver detected in the right retroperitoneal area, like an adrenal tumor (Figure 1). The mass measured 6 cm × 5 cm × 7.5 cm in size. The tumor was enhanced by the intravenous contrast agent and had areas of

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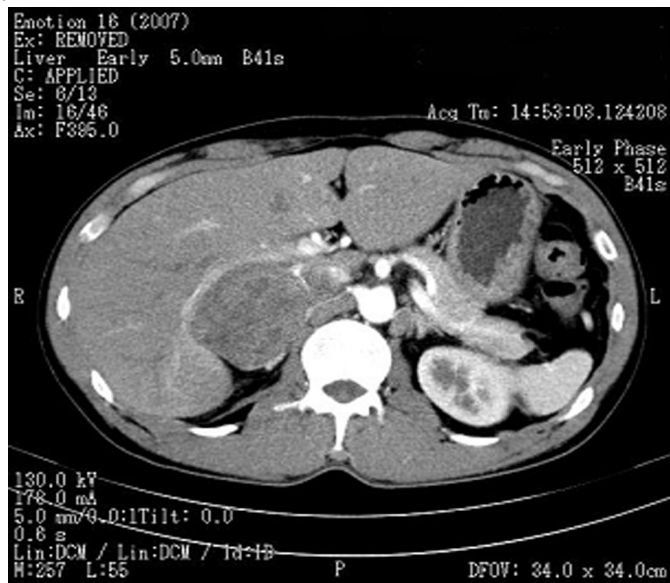
#### Abbreviations and Acronyms

CT = computed tomography

MRI = magnetic resonance image

PK = PlasmaKinetic

Figure 1. Computed Tomography Image Showing a Large Mass Close to the Liver in the Right Retroperitoneal Space. doi: 10.3834/uij.1944-5784.2010.08.15f1



focal necrosis; however, there were no signs of local invasion to adjacent structures. Magnetic resonance imaging (MRI) demonstrated a heterogeneous mass with smooth borders. The authors considered the possibility of malignancy due to its large size (7.5 cm at the largest diameter) and imaging pattern.

Laparoscopic surgery was performed transabdominally with the patient in the left lateral position. The trocar used to introduce the 30° endoscope was positioned using an open technique in the right paraumbilical region. Two trocars (12 mm and 5 mm) were placed: (1) in the right paramedian line 10 cm above the trocar for the endoscope, and (2) in the anterior axillary line across the right costal margin, for the operator's instruments. Another 12 mm trocar was inserted between the 2 above-mentioned trocars to insert assistant instrumentation. Laparoscopy revealed a large mass in the right retroperitoneal area, attached to the liver (Figure 2). Dense adhesions to the liver were also observed. The tumor was carefully dissected from the liver with a 33-cm long PlasmaKinetic (PK) cutting forceps (Gyrus ACMI, Southborough, MA, USA). It was then removed completely from the retroperitoneal space. PK cutting forceps were also used to control bleeding from the vessels arising from the tumor. The normal right adrenal gland was identified above the tumor and was excised along with the tumor (Figure 3).

The total operation time was 240 minutes. Blood loss was 50 mL. No drains were used and the recovery was uneventful. The patient started oral intake and ambulation on the first postoperative day. At the 10-month follow-up, the patient was doing well with no evidence of recurrence.

Macroscopically, the tumor mass was well-circumscribed and measured 8 cm × 5.5 cm. Microscopically, the tumor was

Figure 2. Laparoscopic View of a Large Mass in the Right Retroperitoneal Area, Attached to the Liver. doi: 10.3834/uij.1944-5784.2010.08.15f2

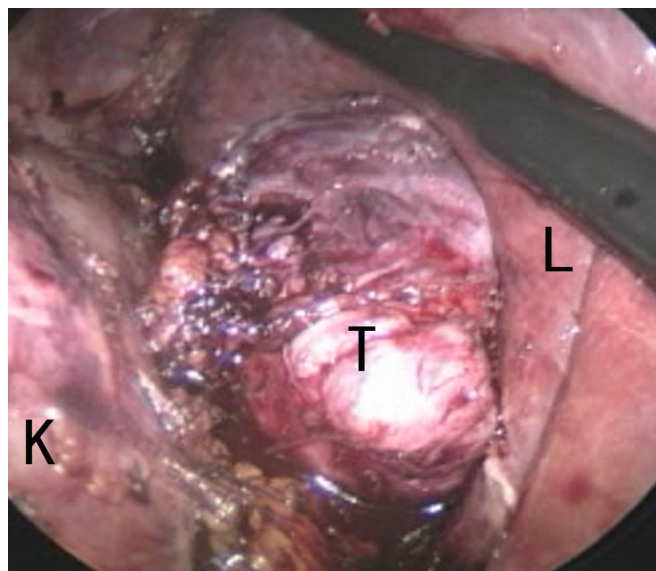
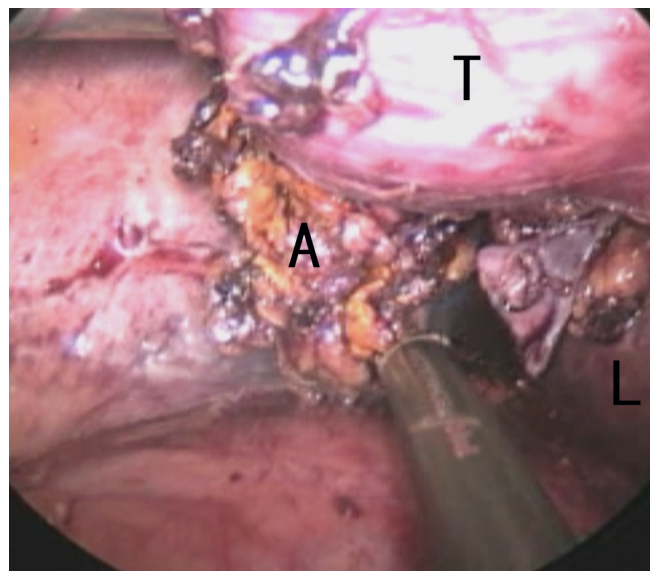


Figure 3. Laparoscopic View After Dissection of the Mass in the Right Retroperitoneal Area. doi: 10.3834/uij.1944-5784.2010.08.15f3



Abbreviations: A, adrenal gland; K, kidney; L, liver; T, tumor

Figure 4a. Histopathological Examination of the Tumor Specimen Showing Proliferation of Spindle-Shaped Cells with Eosinophilic Cytoplasm (Hematoxylin-Eosin Stain, x100). doi: 10.3834/uij.1944-5784.2010.08.15f4a

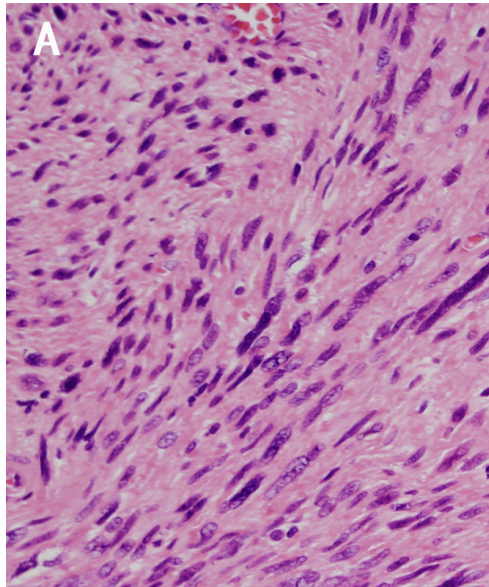
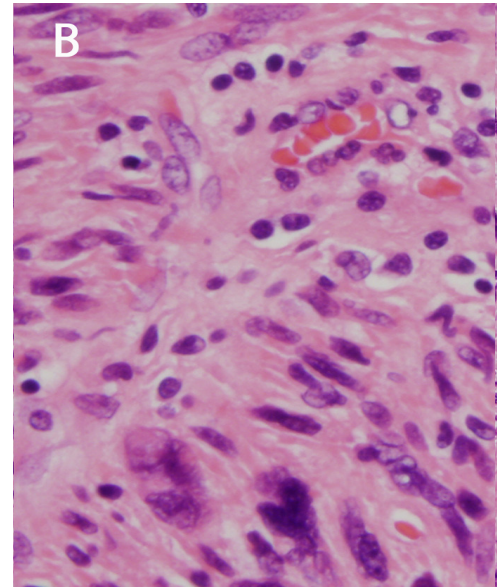


Figure 4b. Histopathological Examination of the Tumor Specimen Showing the Central Location and Cigar-Shaped Appearance of the Cell Nuclei (Hematoxylin-Eosin Stain, x400). doi: 10.3834/uij.1944-5784.2010.08.15f4b



composed of spindle-shaped cells with eosinophilic cytoplasm, and muscular and fibrous tissue with a fibrous stroma (Figure 4a). Most of the cell nuclei were centrally located and had a cigar-shaped appearance (Figure 4b). In some areas of the tumor, nuclear hyperchromatism and pleomorphism were notable. Coagulative T-cell necrosis was evident. There were over 10 mitotic figures per 10 high-power fields (HPF), and atypical mitoses were often seen. Immunohistochemistry showed positive staining for expression of desmin, smooth muscle actin (SMA), and caldesmon, and negative expression for CD34 and S-100 (Figure 4c; Figure 4d; Figure 4e). The percentage of tumor cells showing positive staining for Ki-67 was about 5% (Figure 4f). Thus, the tumor was diagnosed as leiomyosarcoma with negative surgical margins.

## DISCUSSION

Retroperitoneal leiomyosarcoma tumors typically grow slowly and remain asymptomatic until the tumor becomes evident as a large mass [2]. Because of the large tumor border, open surgery is commonly selected. A PubMed (US National Library of Medicine; Bethesda, MD, USA) search of the literature using the terms leiomyosarcoma and laparoscopy revealed fewer than 10 previously reported cases of laparoscopic resection of retroperitoneal leiomyosarcoma [5-8].

Advances in imaging techniques, notably MRI and CT, permit

excellent visualization and evaluation [9]. However, benign tumors cannot be definitively differentiated from malignant disease by these modalities, especially when the lesion is located in or near the adrenal gland.

Minimally invasive surgical techniques are being applied with increasing frequency for the treatment of retroperitoneal disease [10]. Retroperitoneal tumors can be resected laparoscopically with careful preoperative investigation and meticulous laparoscopic techniques. The size of the tumor should not influence the decision for laparoscopic excision. In the present case, complete laparoscopic excision was performed and the patient has remained free of recurrence for at least 10 months. The main risk due to the compression of the inferior vena cava (IVC) was a venous effraction with massive hemorrhage. Dense adhesions to the liver could be released with the help of sealing devices such as PK. The results show that laparoscopic excision of a retroperitoneal leiomyosarcoma tumor can be applied safely and successfully as a minimally invasive procedure.

The advantages of laparoscopic surgery reported in some retrospective series include a shorter hospital stay, earlier return of gastrointestinal function, earlier return to regular activity, decreased pain, earlier ambulation, decreased wound problems, excellent cosmetic results, and sometimes



Figure 4c. Immunohistochemistry Showing Positive Staining for Desmin Expression (×400).

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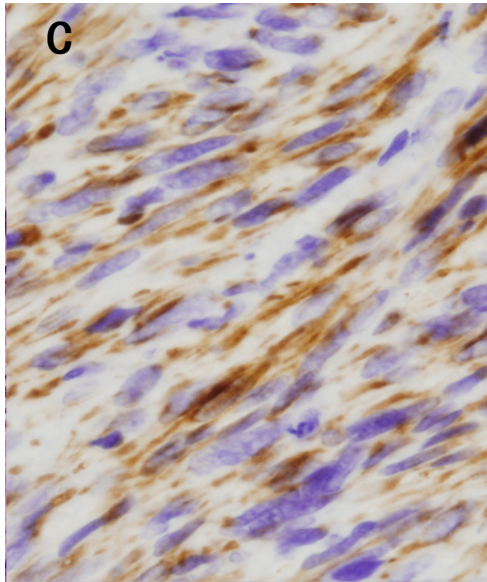


Figure 4e. Immunohistochemistry Showing Positive Staining for Caldesmon Expression (×400).

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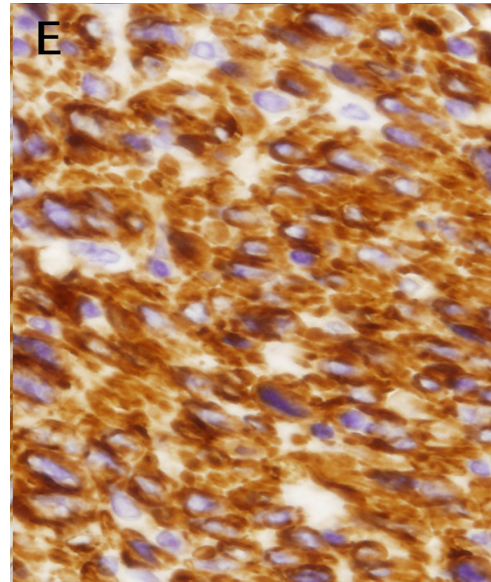


Figure 4d. Immunohistochemistry Showing Positive Expression for Smooth Muscle Actin (×400).

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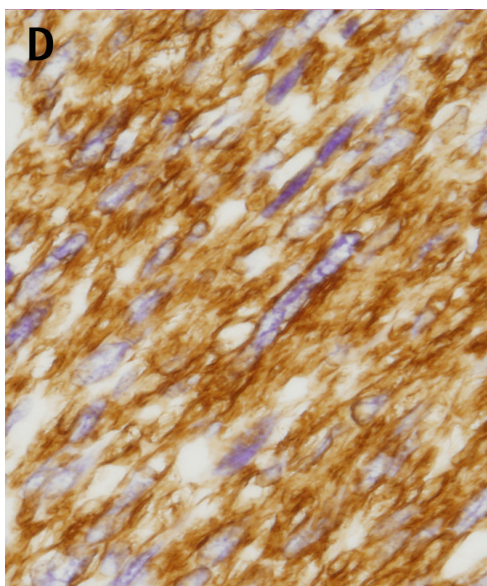
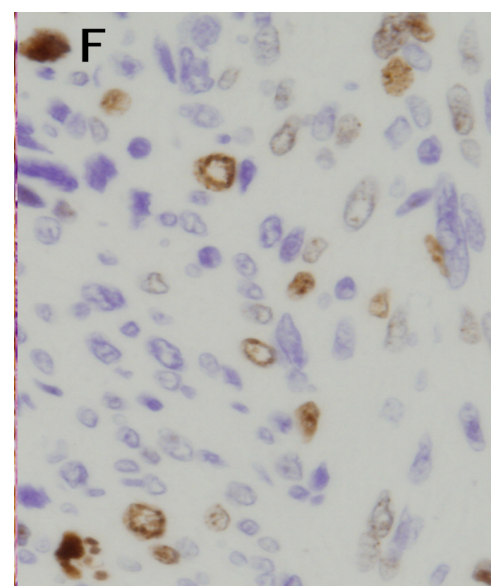


Figure 4f. Immunohistochemistry Showing Approximately 5% Positive Tumor Cell Staining for Ki-67 (×400).

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decreased overall cost [11]. Meanwhile, port site recurrence with malignancy is well described in the laparoscopic literature. Leiomyosarcoma also has the ability to implant in wounds. Therefore, recurrence at the port site has previously been reported after laparoscopic surgery of retroperitoneal sarcoma [12]. However, not all studies reported that an increased risk was intrinsic to laparoscopy.

Some studies report recurrence rates of retroperitoneal leiomyosarcoma ranging from 45% to 82% after complete resection [13]. According to these series, approximately 80% to 87% of all local recurrences become evident within 2 years and 100% are detected within 3 years [11]. Patients with retroperitoneal leiomyosarcomas should be followed closely, especially for the first 3 years after the primary treatment.

## CONCLUSION

Retroperitoneal leiomyosarcoma with dense adhesions to the liver could be removed via a laparoscopic approach with careful preoperative investigation and meticulous laparoscopic techniques. Patients with retroperitoneal leiomyosarcomas should have close follow-up surveillance during the first 3 years due to high recurrence rate.

## REFERENCES

- [1] Wu YY, Wei Q, Zeng H, Chen HG, et al. An unusual case of aldosterone- and norepinephrine-secreting retroperitoneal leiomyosarcoma. *Eur Surg Res*. 2008;41(2):214-218.
- [2] Felix EL, Wood DK, Das Gupta TK. Tumors of the retroperitoneum. *Curr Probl Cancer*. 1981;6(1):1-47.
- [3] Raut CP, Pisters PW. Retroperitoneal sarcomas: Combined-modality treatment approaches. *J Surg Oncol*. 2006;94(1):81-87.
- [4] Ishikawa K, Hirashita T, Araki K, et al. A case of retroperitoneal mucinous cystadenoma treated successfully by laparoscopic excision. *Surg Laparosc Endosc Percutan Tech*. 2008;18(5):516-519.
- [5] Viani MP, Poggi RV, Pinto A, Maruotti RA. Gasless laparoscopic removal of retroperitoneal leiomyosarcoma. *J Laparoendosc Surg*. 1995;5(1):47-54.
- [6] Agresta F, De Simone P, Michelet I, Bedin N. Retroperitoneal leiomyosarcoma mimicking acute appendicitis: laparoscopic management. *JSLs*. 2003;7(2):177-179.
- [7] Liao CH, Lai MK, Li HY, Chen SC, Chueh SC. Laparoscopic adrenalectomy using needlescopic instruments for renal tumors less than 5cm in 112 cases. *Eur Urol*. 2008;54(3):640-646.
- [8] Henry JF, Sebag F, Iacobone M, Hubbard J, Maweja S. Lessons learned from 274 laparoscopic adrenalectomies [in French] *Ann Chir*. 2002;127(7):512-519.
- [9] van Rooij WJ, Martens F, Verbeeten B Jr, Dijkstra J. CT and MR imaging of leiomyosarcoma of the inferior vena cava. *J Comput Assist Tomogr*. 1988;12(3):415-419.
- [10] Cadeddu MO, Mamazza J, Schlachta CM, Seshadri PA, Poulin EC. Laparoscopic excision of retroperitoneal tumors: technique and review of the laparoscopic experience. *Surg Laparosc Endosc Percutan Tech*. 2001;11(2):144-147.
- [11] Linos DA, Stylopoulos N, Boukis M, Souvatzoglou A, Raptis S, Papadimitriou J. Anterior, posterior, or laparoscopic approach for the management of adrenal diseases? *Am J Surg*. 1997;173(2):120-125.
- [12] Clark MA, Thomas JM. Portsite recurrence after laparoscopy for staging of retroperitoneal sarcoma. *Surg Laparosc Endosc Percutan Tech*. 2003;13(4):290-291.
- [13] Zhang G, Chen KK, Manivel C, Fraley EE. Sarcomas of the retroperitoneum and genitourinary tract. *J Urol*. 1989;141(5):1107-1110.