Case Report

# Robotic-assisted excision of a juxta renal retroperitoneal schwannoma

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**Abstract**

Retroperitoneal schwannoma is a rare benign tumor of the peripheral nerve Schwann sheath. We, herein, report the case of a 74-year-old woman who presented with vague abdominal pain. Computed tomography imaging revealed a retroperitoneal mass that is medial to the right kidney. The patient underwent robotic excision of the tumor with the pathology revealing schwannoma. We report this case due to the scarcity of this disease entity, especially at this location and to emphasize the indication and value of robotic technology in different pathological processes retroperitoneally.

**Keywords:** Minimally invasive surgery, robotic surgery, schwannoma

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## INTRODUCTION

Schwannoma is a rare tumor arising from the Schwann sheath of the peripheral nerve. It tends to affect young to middle-aged adults and is twice as common in women than men.[1-4] It could arise in different body locations including the head, neck, and flexor surfaces of the upper and lower limbs.[4] Retroperitoneal schwannoma occurs in 0.3%–3.2% of all benign schwannomas.[4] In addition, it is usually found in the paravertebral space, presacral region, or adrenal gland.[2] Schwannoma is a slow-growing benign tumor in most cases.[2,4] Due to the nonspecific nature of symptoms, clinical diagnosis is difficult to establish in the early stage.[5,6] However, clinical presentation depends on location, size, and nearby organs.

Different pathological processes could occur retroperitoneally that are like schwannoma clinically in most of the time and need pathological examination to confirm the diagnosis like paraganglioma, pheochromocytoma, liposarcoma, and malignant fibrous histiocytoma. Due to the rarity of this disease entity, clear guidelines based on a large series of patients have yet to be established. The surgical approach must be individualized based on the tumor condition. Robotic surgery has shown a great value in several cases for retroperitoneal tumor pathologies.[7-10] In this report, we describe the case presentation and the management surgical approach to retroperitoneal schwannoma.

## CASE REPORT

A 74-year-old woman is known to have type-2 diabetes mellitus, hypertension, and hypothyroidism. She presented with a history of vague abdominal pain for 3 months associated with nausea and vomiting. She has no history

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of fever, weight loss, or lower urinary tract symptoms. On physical examination, she was conscious, oriented with normal vital signs. There were no palpable masses, tenderness, or palpable lymph nodes. Laboratory investigations revealed a white blood cell count of $9 \times 10^9$/L and hemoglobin of 13 g/dl. Urinalysis was normal. Creatinine level was 113 umol/l, urea of 10.3 umol/l, and an estimated glomerular filtration rate of 112 ml/min/1.73 $m^2$ with no electrolyte imbalance. Tumor markers were within the normal level that included CA 19-9 was 26.69 U/ml and CA 125 was 22.69 U/ml. Abdominal ultrasonography showed a large well-defined rounded mass adjacent to the right kidney with central necrosis. The mass measured around 7.3 cm × 5.8 cm with intact vascularity within it. Computed tomography (CT) [Figure 1a] revealed a large irregular enhancing retroperitoneal mass measuring 70 mm × 55 mm × 50 mm displacing the right kidney and ureter inferolateral with a central necrosis. It also showed a duplex right collecting system fused at the mid ureter. Magnetic resonance imaging (MRI) of the abdomen [Figure 1b] showed a sizable oval-shaped mass lesion that appeared of low signal intensity on T1-weighted images and of low heterogeneous signal on T2WI and showed enhancement of the peripheral component. It was surrounded by a rim of fat stranding and edema, but no retroperitoneal lymphadenopathy or invasion of the adjacent structures.

The patient was prepared for elective surgical excision with robot-assisted laparoscopy. Retrograde pyelography was done, before the surgical excision, to delineate the duplex system and to insert a double-J stent in the upper moiety for intraoperative identification [Figure 1c]. There was no filling defect or any fistula communication with the collecting system. She was positioned on the left lateral decubitus at 60°. Port placement was carried out as in Figure 2. Ascending colon was reflected medially. Retroperitoneally, the dissection was started at the lower aspect of the mass and lateral to the gonadal vein. A plane was created between the gonadal vein and the confluence of both ureters where the lower aspect of the mass was dissected completely. Attention was then directed to the medial aspect of the mass where it was dissected from the vena cava and the gonadal vein easily. Dissection was continued posteriorly where multiple feeding vessels were identified, clipped, and divided. Laterally, the mass was dissected from both collecting systems. At the upper aspect of the mass, careful dissection was made until it was completely excised. The resected mass was 88.8 g in weight and measuring 70 mm × 55 mm × 50 mm [Figure 3b]. Operative time was 4.5 h. Blood loss was <100 cc. Postoperatively, the patient had a smooth recovery and was discharged 2 days later in a good condition.

Serial sectioning of the mass showed nodular and fibromyxoid cut surface with focal cystic degeneration [Figure 3a]. Under microscopic examination, the neoplasm had bland spindle cells with hypercellular (Antoni A) and myxoid hypocellular (Antoni B) areas. Nuclear palisading (Verocay bodies) are seen. Immunostaining positivity with S100 supports the diagnosis of schwannoma. This bland spindle cell neoplasm is positive Vimentin and was negative for pan-cytokeratin, smooth muscle actin, CD117, CD34, and desmin. The surgical margin was negative.

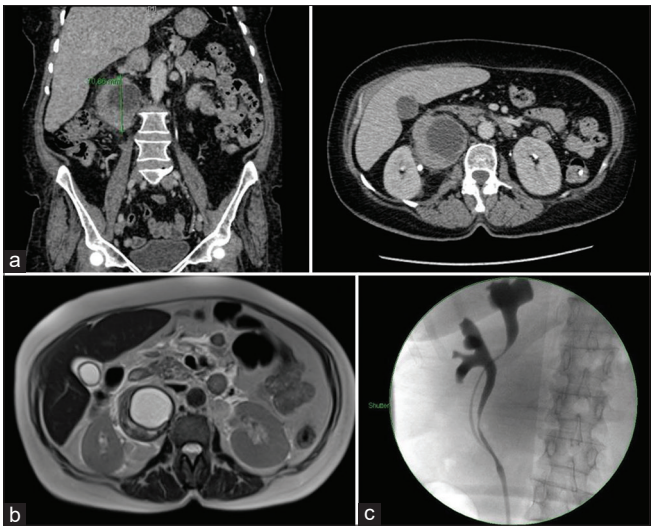


**Figure 1:** (a) Computed tomography scan showing axial and coronal views of the heterogeneously enhancing lesion measuring 7 cm. This image was taken in the excretory phase. (b) A coronal magnetic resonance imaging view showing the oval-shaped mass with a necrotic core, which appeared of low signal intensity on T1-weighted images and of low heterogeneous signal on T2-weighted images and shows enhancement of the solid component. (c) Retrograde pyelogram showing a duplex right collecting system fused at the mid ureter

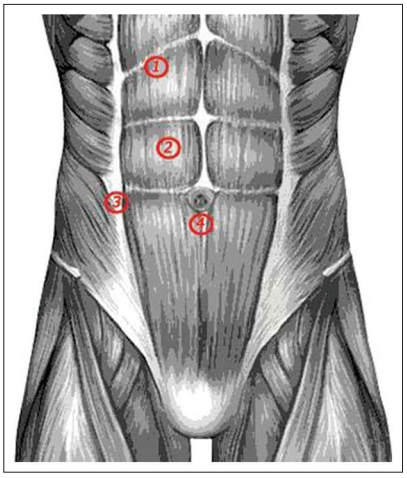


**Figure 2:** A 3-arm robotic system was used with the camera port placed 2 cm above and lateral to the umbilicus. One robotic arm was placed at the right subcostal area at the mid-clavicular line and the other at the right iliac fossa. A 12-mm assistant port was placed at the midline just below the umbilicus

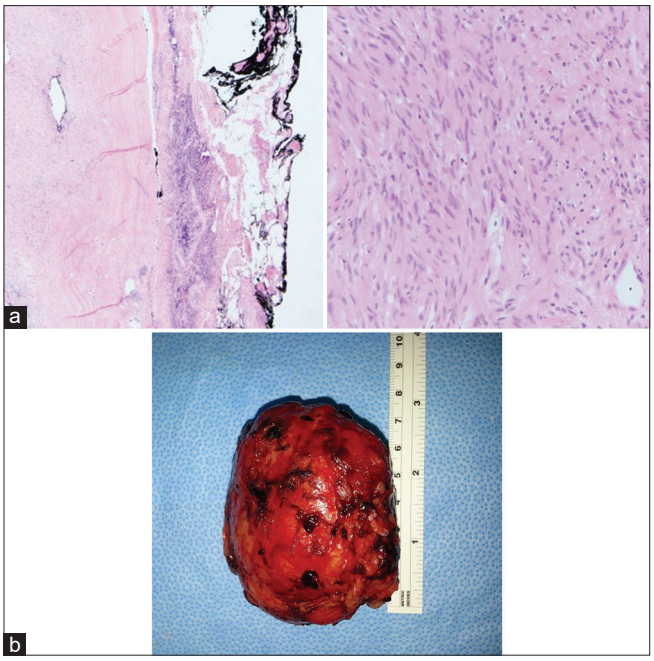

**Figure 3:** (a) Microscopic slices of the lesion showing bland spindle cells with hypercellular (Antoni A) areas and myxoid hypocellular (Antoni B) areas and nuclear palisading (Verocay bodies. (b) The gross specimen measuring at 88.8 g in weight and measuring 70 mm × 55 mm × 50 mm

The patient was followed regularly in the clinic where she showed a dramatic improvement clinically. A follow-up CT scan was done at the 6th month with no evidence of tumor recurrence.

## DISCUSSION

Axial imaging is the most widely used modality to evaluate schwannomas.[4] MRI allows for better evaluation of origin, vascularity, and extent of the tumor rather than its nature.[2-4] Furthermore, CT-guided core biopsy and fine-needle aspiration have been reported to be of limited role in detecting retroperitoneal schwannomas.[1,11,12] Therefore, surgical excision has been a favored method in diagnosing these tumors[1] A positive immunostain 100 is important in the pathological diagnosis.[13] In our case, we preferred to do MRI to further characterize the mass and exclude any relation between it and the collecting system. As expected, MRI further increased our preoperative anatomical awareness regarding any regional involvement. Because of its limited role in diagnosing such tumors, the biopsy was not an attractive option for us.[5,6]

It has been reported that total surgical excision is the standard modality of treatment in retroperitoneal schwannomas.[4,14] There have been reports of malignant transformation and metastasis postoperatively[2] and total excision with negative tissue margins should be performed in order to avoid recurrence.[1] In our case, we did not know the diagnosis preoperatively. Furthermore, the mass appeared to be of malignant potential that mandated its excision. Given the possibility of retroperitoneal schwannomas to become malignant, recur, or metastasize, it is of importance that the mass be visualized as clearly as possible and resected along a surgical plane which allows full removal with wide margins.[15] Finally, the mass's proximity to both ureters was another important factor to consider.

Robot-assisted surgery is a promising method and quickly becoming preferred given its advantage of three-dimensional visualization and superior mobility for the surgeon. It is gaining widespread popularity in functional, oncological, and reconstructive urology.[16] It is also showing increasing success and safety in the management of retroperitoneal pathologies.[15-17] As a result of ergonomics, optimal magnification of the operative field, surgeon dexterity, and precision of surgical manipulation, robotic technology has been shown to overcome many difficulties associated with pure laparoscopy.[17] Other advantages to robotic surgery using the da Vinci surgical system specifically include reduced hospital stay and less blood loss.[18]

The natural history of the disease showed a favorable prognostic outcome;[3] however, due to the possible risk of malignant transformation, follow-up is highly recommended.[1,2,4] It is not always necessary to excise such tumors if the preoperative diagnosis can be reached. However, for fear of malignant transformation and invasion to nearby organs, excision is indicated even if the preoperative diagnosis was reached. We believe that this case report can add to the pool of literature, expand the indications of robotic surgery, and add further information about the natural history of such disease to the literature. In such a way, unnecessary surgery can be avoided in selected cases. However, when surgery is eventually required, robot-assisted excision should be highly considered.

## CONCLUSION

Guidelines have yet to be established due to the scarcity of this disease entity. Given its enhanced vision, ergonomics, and dexterity, robot-assisted excision is a feasible and safe option. It reduces blood loss with decreased hospital stay that adds advantageous outcomes in comparison to other different surgical and management options.

### Declaration of patient consent

The authors certify that they have obtained all appropriate

patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

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