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Oncology

Perirenal schwannoma mimicking a renal mass: A diagnostic pitfall – Case report

M.A. Sobhi [a,*], L. Hamedoun [a], M. Mrabti [a], M. Tbouda [b], M. Alami [a], A. Ameur [a]

[a] Departement of Urology, Mohammed V Military Hospital, Rabat, Morocco
[b] Department of Pathology, Ouad Dahab Military Hospital, Agadir, Morocco

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ABSTRACT

Perirenal schwannomas are rare benign tumors that may radiologically mimic renal malignancies. We report the case of a 39-year-old asymptomatic woman with an incidentally discovered perirenal mass initially suspected to be renal cancer. Intraoperatively, the lesion appeared well-encapsulated and extrarenal. Complete excision was performed, sparing the kidney. Histopathological analysis confirmed the diagnosis of benign schwannoma. This case highlights the diagnostic challenge of perirenal schwannomas and emphasizes the importance of intraoperative assessment and histological confirmation to avoid unnecessary nephrectomy.

1. Introduction

Schwannomas are benign, encapsulated tumors derived from Schwann cells of the peripheral nerve sheath. While they commonly arise in the head, neck, and extremities, their occurrence in the retroperitoneal space is rare, accounting for only 0.3 %–3.2 % of retroperitoneal tumors.[1] Perirenal schwannomas represent an exceptionally uncommon subset and are often asymptomatic, typically discovered incidentally during imaging performed for unrelated complaints.[2]

Radiologically, these tumors may closely mimic renal neoplasms, especially when they exhibit mixed solid and cystic components, thickened walls, post-contrast enhancement, or diffusion restriction. Such features are characteristic of Bosniak III or IV complex renal cysts and cystic variants of renal cell carcinoma, which can mislead clinicians.[3,4]

This diagnostic overlap may lead to overtreatment, including unnecessary nephrectomy. Therefore, perirenal schwannoma should be considered in the differential diagnosis of atypical renal or perirenal masses.

Herein, we report the case of a 39-year-old asymptomatic female in whom a right perirenal mass was incidentally discovered during radiological evaluation for a non-urological complaint. The lesion was initially presumed to be a renal malignancy. The patient underwent surgical excision, and final histopathological examination confirmed the diagnosis of a benign schwannoma. This case highlights the diagnostic pitfalls associated with atypical renal or perirenal masses and underscores the importance of including schwannoma in the differential diagnosis to avoid unnecessary organ loss.

2. Case presentation

A 39-year-old woman with a medical history of asthma presented with mechanical lumbosciatalgia. She had no constitutional symptoms such as fever or weight loss, nor any urological complaints including hematuria, dysuria, or flank pain. Clinical examination was unremarkable.

A non-contrast lumbar computed tomography (CT) scan performed to investigate the back pain incidentally revealed a right-sided retroperitoneal soft-tissue mass adjacent to the inferior pole of the right kidney. The lesion showed homogeneous tissue density with an attenuation value of approximately 30 Hounsfield Units (HU), suggesting a soft-tissue component.

To further evaluate the lesion, a contrast-enhanced CT urogram was performed, which demonstrated a well-circumscribed lesion measuring 41 × 47 mm. The lesion had irregular, thickened walls and internal septations but no macroscopic fat or calcifications (Fig. 1).

Subsequent magnetic resonance imaging (MRI) of the abdomen provided better soft-tissue contrast and confirmed the presence of a 41 × 38 × 54 mm mass, located adjacent to the lower renal pole. The lesion appeared hypointense on T1-weighted sequences, isointense on T2-

* Corresponding author.
E-mail addresses: mohamedalaa_sobhi@um5.ac.ma (M.A. Sobhi), larbi771@gmail.com (L. Hamedoun), dr.mohammedmrabti@gmail.com (M. Mrabti), dc.med.tbouda@gmail.com (M. Tbouda), alamim1965@gmail.com (M. Alami), ahmed.ameur@yahoo.fr (A. Ameur).

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weighted images, and exhibited restricted diffusion on diffusion-weighted imaging. Post-gadolinium contrast administration, the lesion demonstrated irregular and enhancing parietal thickening, radiological features highly suspicious for a chromophobe renal cell carcinoma (chRCC) (Fig. 2). No lymphadenopathy or distant lesions were noted.

Based on the radiologic suspicion of malignancy, the patient was scheduled for laparoscopic partial nephrectomy via a transperitoneal approach. However, intraoperative findings significantly altered the diagnostic impression. A well-encapsulated, oval-shaped mass was discovered within the perirenal fascia (Gerota's fascia) but clearly separate from the renal parenchyma. The lesion demonstrated no infiltration into adjacent structures, including the kidney or adrenal gland. A distinct dissection plane between the mass and the renal capsule was readily identified, allowing for complete excision of the lesion without nephron loss (Fig. 3).

The patient's postoperative recovery was uneventful. Drainage output on postoperative day one was less than 50 mL and showed no signs of hemorrhage or chyle leak. Bowel transit resumed by postoperative day two, and the patient was discharged in stable condition without complications.

Macroscopic examination revealed a well-encapsulated mass with a firm consistency. Microscopic analysis demonstrated a spindle cell proliferation arranged in fascicles, with alternating hypercellular (Antoni A) and hypocellular (Antoni B) areas, as well as characteristic Verocay bodies, consistent with a schwannoma. No cytological atypia, necrosis, or increased mitotic activity was observed, and there were no histological features suggestive of malignancy (Fig. 4).

At 6-month follow-up, the patient remained asymptomatic with no evidence of recurrence.

Given the size and rare location of the lesion, we recommended long-term surveillance with annual abdominal MRI for at least three years, following initial imaging at 6 and 12 months postoperatively.

3. Discussion

Retroperitoneal schwannomas are rare benign tumors arising from Schwann cells of the peripheral nerve sheath. They account for less than 3 % of all retroperitoneal tumors, and their perirenal localization is exceptionally uncommon.[5,6] (5, 6). These tumors are more frequently diagnosed in adults aged 20–60 years, with a slight female predominance.[1]

Due to their slow growth and deep anatomical location, retroperitoneal schwannomas are frequently asymptomatic and discovered incidentally. When symptomatic, patients typically present with nonspecific symptoms such as abdominal or flank pain, palpable mass, or discomfort from compression of adjacent structures. In the present case, the lesion was identified during a work-up for lumbosciatalgia, a nonspecific symptom consistent with nerve root compression, which has been previously reported in the literature.[4,7]

Radiologically, retroperitoneal schwannomas present a diagnostic challenge due to their nonspecific imaging characteristics, which often overlap with other retroperitoneal neoplasms. On MRI, these tumors typically appear hypointense on T1-weighted images and hyperintense on T2-weighted sequences, reflecting their myxoid and cystic components. Post-contrast images usually reveal heterogeneous enhancement, attributable to intrinsic degenerative changes such as cyst formation, hemorrhage, necrosis, and fibrosis.[8] CT imaging often demonstrates well-defined, encapsulated masses with low or mixed attenuation, sometimes containing punctate calcifications and areas of cystic degeneration. Despite their benign nature, their size and location can lead to displacement of adjacent structures without evidence of invasion.[9,10] These imaging features, while suggestive, are not pathognomonic and necessitate histopathological confirmation.

In our case, the MRI appearance was consistent with prior reports of schwannomas, although the imaging features overlapped significantly with those seen in chromophobe RCC, a rare subtype of RCC that typically presents as a homogeneous, hypovascular mass with a well-defined capsule.[11]

These overlapping features led to a preoperative misdiagnosis, which is not uncommon. Similar diagnostic dilemmas have been reported, including schwannomas mimicking renal cell carcinomas or metastatic lymph nodes on imaging.[3,4]

Although image-guided percutaneous biopsy could potentially aid in preoperative differentiation between benign and malignant masses, it is

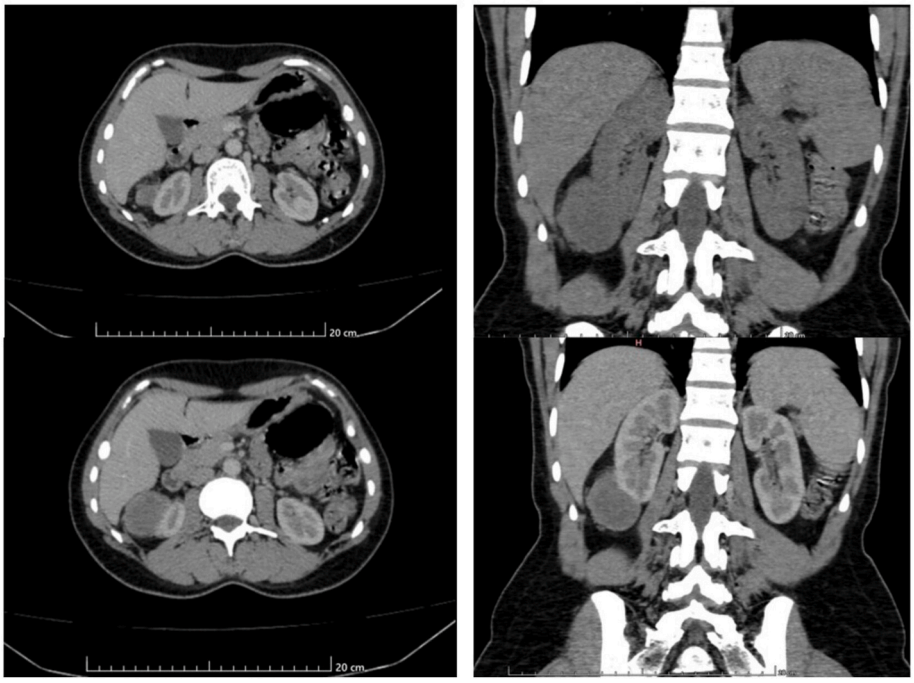

Fig. 1. Preoperative contrast-enhanced abdominal CT scan (axial and coronal views) showing a well-defined, hypodense mass closely abutting the anterior surface of the right kidney.

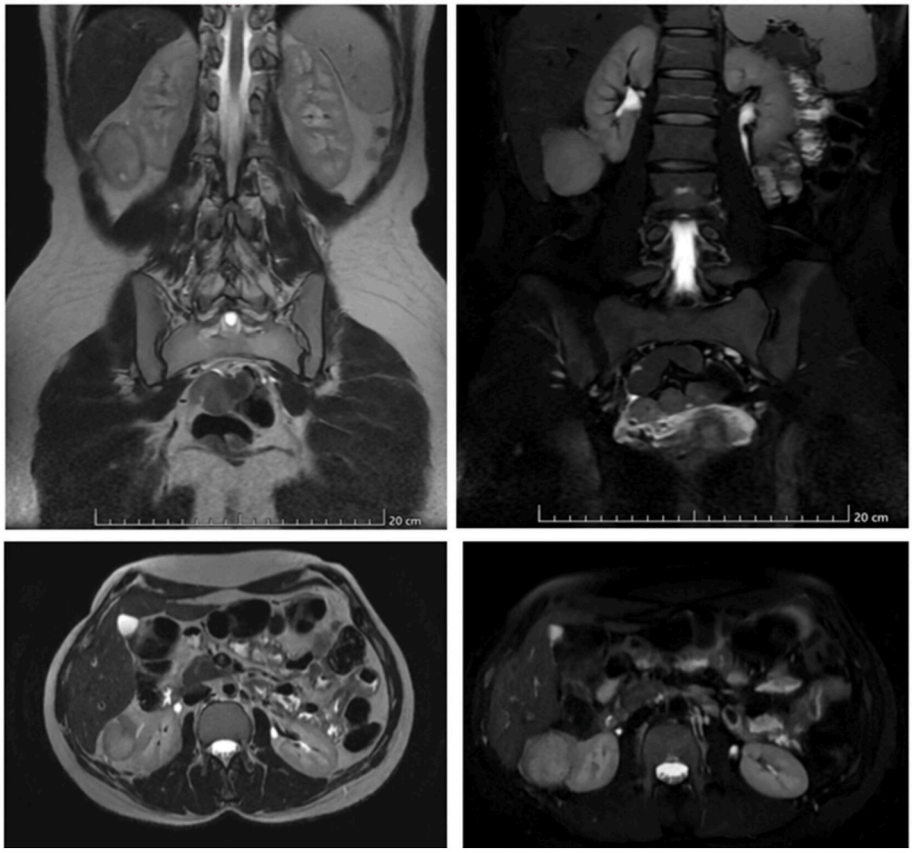

Fig. 2. Preoperative MRI of the abdomen: Coronal and axial T1-and T2-weighted images demonstrate an encapsulated, exophytic mass adjacent to the right kidney, suggestive of a renal neoplasm.

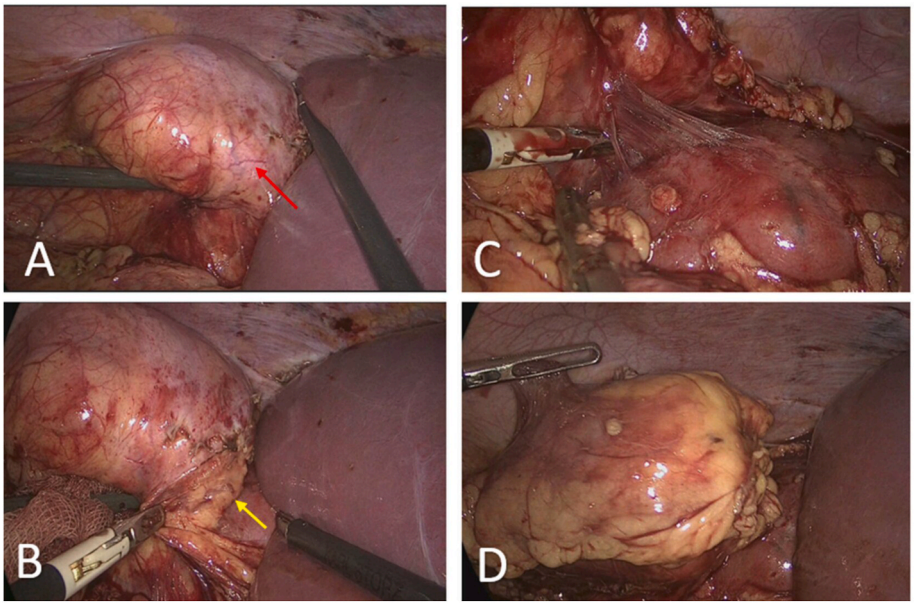

Fig. 3. Intraoperative images: (A) Initial laparoscopic visualization of the perirenal mass (red arrow), which appears well-circumscribed and closely apposed to the anterior surface of the right kidney, mimicking a primary renal tumor. (B) Dissection reveals a clear plane between the mass and the renal capsule (yellow arrow), confirming the absence of parenchymal invasion. (C) Further mobilization exposes the posterior aspect of the lesion, demonstrating its extrarenal origin and well-defined capsule. (D) Final appearance of the excised mass, showing a lobulated, encapsulated, tumor consistent.

controversial and often avoided in retroperitoneal tumors. Limitations include sampling error, tumor heterogeneity, risk of bleeding, and possible tumor seeding along the biopsy tract.[12,13] Additionally, the cellular features of schwannomas, particularly their spindle-cell morphology, can mimic sarcomas or other spindle-cell neoplasms when sampled in isolation.[14]

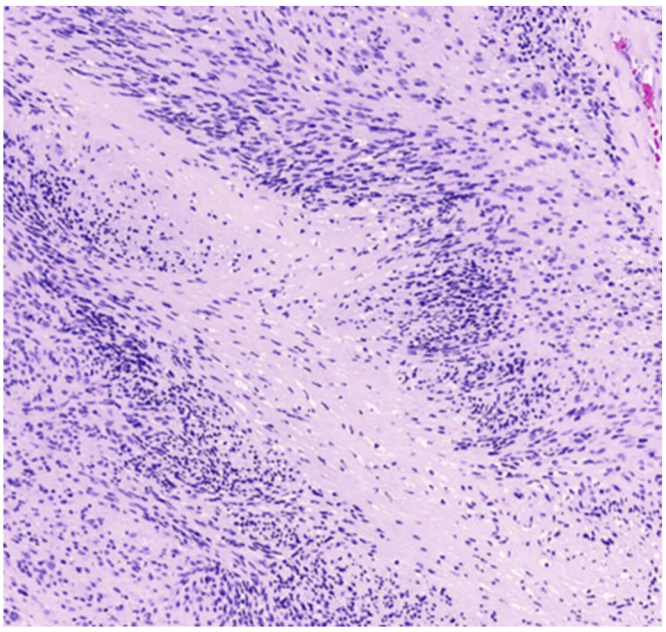

Fig. 4. H&E stain, x 200. Neuroid spindle cell tumor proliferation with the presence of Verocay bodies.

Thus, definitive diagnosis relies on histopathological evaluation. Schwannomas classically demonstrate Antoni A (hypercellular) and Antoni B (hypocellular) areas, with characteristic Verocay bodies in well-differentiated regions.[15]

The cornerstone of treatment for retroperitoneal schwannomas is complete surgical excision, which is both diagnostic and therapeutic. For tumors that are well-circumscribed and not infiltrating adjacent structures, laparoscopic resection is a safe and minimally invasive option with low recurrence risk.[16]

In our patient, intraoperative findings revealed a well-encapsulated, oval mass located within Gerota's fascia, with no direct invasion into the renal parenchyma. These characteristics allowed for complete excision without nephrectomy, thereby preserving renal function and avoiding unnecessary organ removal. This case exemplifies the diagnostic uncertainty that can arise when radiologic findings mimic renal malignancy, yet intraoperative exploration reveals a well-encapsulated lesion without renal invasion, prompting a shift from oncologic to conservative surgical management.

4. Conclusion

This case illustrates the diagnostic complexity of perirenal schwannomas. Despite advanced imaging, differentiation from renal tumors remains difficult. Clinicians should consider benign peripheral nerve sheath tumors in the differential diagnosis of complex perirenal masses. Intraoperative assessment and histopathology are crucial for avoiding unnecessary nephrectomy.

CRediT authorship contribution statement

M.A. Sobhi: Writing – review & editing, Writing – original draft, Visualization, Methodology, Formal analysis, Data curation, Conceptualization. **L. Hamedoun:** Writing – review & editing, Visualization, Validation, Investigation, Conceptualization. **M. Mrabti:** Writing – review & editing, Validation, Investigation, Conceptualization. **M. Tbouda:** Writing – review & editing, Visualization, Validation, Abdessamad Elbahri, Validation, Supervision, Investigation. **M. Alami:** Visualization, Validation, Supervision. **A. Ameur:** Visualization, Validation, Supervision.

Informed consent

Written informed consent was obtained from the patient.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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