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Case Report

Emphasizing rarity - laparoscopic management of an adrenal schwannoma: a case report and review of the literature

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ABSTRACT

Schwannomas are benign tumors arising from Schwann cells of peripheral nerve sheaths and are most commonly encountered in the head, neck, and extremities. Adrenal schwannomas originate from Schwann cells innervating the adrenal medulla and are typically non-functional, asymptomatic lesions discovered incidentally during imaging performed for unrelated reasons. Adrenal schwannoma is an exceptionally rare entity, accounting for less than 0.2% of all adrenal neoplasms, with fewer than 60 cases reported in the literature. Due to their rarity and nonspecific radiological appearance, these tumors are frequently misdiagnosed preoperatively as adenomas, pheochromocytomas, or adrenocortical carcinoma. We present a case of a non-functional adrenal schwannoma in a 55-year-old female, highlighting the diagnostic challenges and emphasizing the importance of histopathological confirmation.

Keywords: Adrenal schwannoma, Laparoscopic adrenalectomy, Adrenal incidentaloma, Non-functioning adrenal tumor, Neural sheath tumor, Retroperitoneal tumor

INTRODUCTION

Schwannomas are benign tumors derived from Schwann cells of peripheral nerve sheaths and are most commonly found in the head, neck, and extremities. Retroperitoneal schwannomas account for approximately 1-3% of all schwannomas, with adrenal involvement being particularly rare.[1] Fewer than 60 cases of adrenal schwannoma have been reported in the literature to date.[2]

Adrenal schwannomas arise from Schwann cells innervating the adrenal medulla and are typically non-functional and asymptomatic. Most cases are discovered incidentally during imaging performed for unrelated reasons.[2] Preoperative diagnosis remains challenging due to nonspecific imaging findings, which frequently overlap with other adrenal pathologies such as adenoma, pheochromocytoma, and adrenocortical carcinoma.[1,3] Definitive diagnosis is generally achieved only after surgical excision and histopathological examination.

We present a case of a non-functional adrenal schwannoma in a 55-year-old female, highlighting the diagnostic challenges and importance of histopathological confirmation.

CASE REPORT

A 55-year-old female presented to the surgical outpatient department with a six-month history of mild, central abdominal pain. The pain was generalized, non-radiating, and intermittently relieved by analgesics. She had no significant past medical history, no family history of malignancy, and no known genetic syndromes such as neurofibromatosis type 2. Her surgical history was notable for a prior hysterectomy.

Table 1: Comprehensive biochemical evaluation of an adrenal incidentaloma demonstrating normal hormonal profile and exclusion of functional activity.

Test	Patient result	Normal reference range	Interpretation
Plasma free metanephrines	0.2 nmol/l	Metanephrine: <0.5 nmol/l Normetanephrine: <0.9 nmol/l	No biochemical evidence of pheochromocytoma
24-hour urinary fractionated metanephrines	0.64 mg/24 hr	Total metanephrines: <1.3 mg/24 hr (varies by lab)	Pheochromocytoma excluded
Serum cortisol (morning)	13.2 µg/dl	5–25 µg/dl (138–690 nmol/l)	Normal adrenal cortisol secretion
Overnight 1-mg dexamethasone suppression test	5.37µg/dl	Post-dexamethasone cortisol < 1.8 µg/dl (50 nmol/l)	No evidence of cushing syndrome
Aldosterone-to-Renin ratio (ARR)	15 ng/dl per ng/ml/hr	ARR <20–30 (ng/dl per ng/ml/hr, lab-dependent)	No evidence of primary hyperaldosteronism

On examination, her vital signs were stable (blood pressure 128/75 mmHg; heart rate 70 bpm). Abdominal examination was unremarkable. No palpable mass or tenderness was noted. Biochemical evaluation confirmed a non-functional adrenal mass (Table 1).

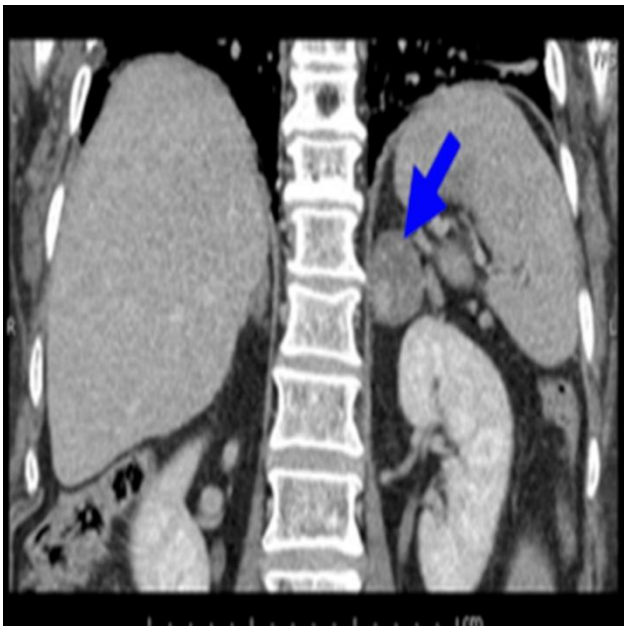

Figure 1: Axial contrast-enhanced CT image of the abdomen showing a well-defined isodense mass (arrow) in the left adrenal gland. The lesion measures 4.5×4.5×6 cm, demonstrates mild heterogeneous enhancement, and is separate from adjacent organs. No vascular invasion is noted.

Imaging workup began with an abdominal ultrasound, which revealed a well-defined isoechoic lesion in the left suprarenal region measuring 4.5×5.3×4.6 cm, exhibiting internal vascularity and scattered calcific foci. A contrast-enhanced CT scan of the abdomen and pelvis further characterized the lesion as a well-circumscribed, isodense mass in the left adrenal region measuring 4.5×4.5×6 cm. Pre-contrast attenuation was 25 HU, post-contrast 50 HU, and delayed-phase 57 HU (Figure 1 and 2). The lesion demonstrated mild heterogeneous enhancement without evidence of necrosis or hemorrhage. Multiple small subcentimeter lymph nodes were noted along the para-aortic, celiac, and left renal artery regions, the largest measuring 1.7×1.4 cm in the celiac area. The mass appeared separate from the kidney, pancreas, and spleen, and no vascular invasion was identified. Although definitive imaging features of adrenocortical carcinoma were absent, the lesion was radiologically indeterminate, and malignancy could not be excluded.

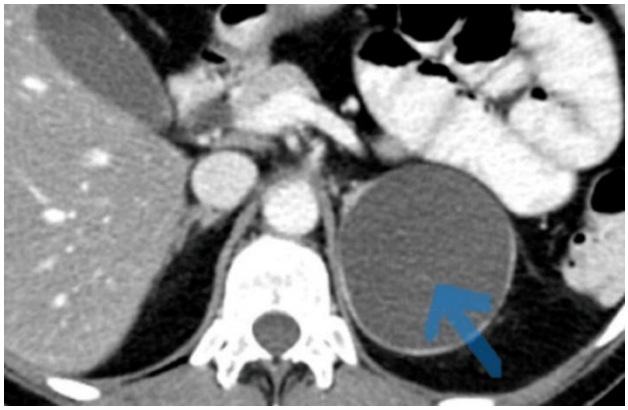

Figure 2: Coronal contrast-enhanced CT image showing a well-circumscribed, homogenous hypodense mass in the left adrenal gland (arrow). The lesion demonstrates smooth margins and is clearly demarcated from adjacent structures, with no evidence of local invasion or vascular involvement.

Surgical management

Given the tumor size (>4 cm) and indeterminate imaging characteristics, laparoscopic left adrenalectomy was performed.

Intraoperatively, a well-encapsulated, moderately firm mass measuring approximately 7×7 cm was identified arising from the left adrenal gland. The tumor was non-

adherent to surrounding structures (Figure 3). A 2×2 cm lymph node was noted near the inferomedial surface of the mass. The adrenal vein was carefully ligated, and the specimen was removed en bloc (Figure 4).

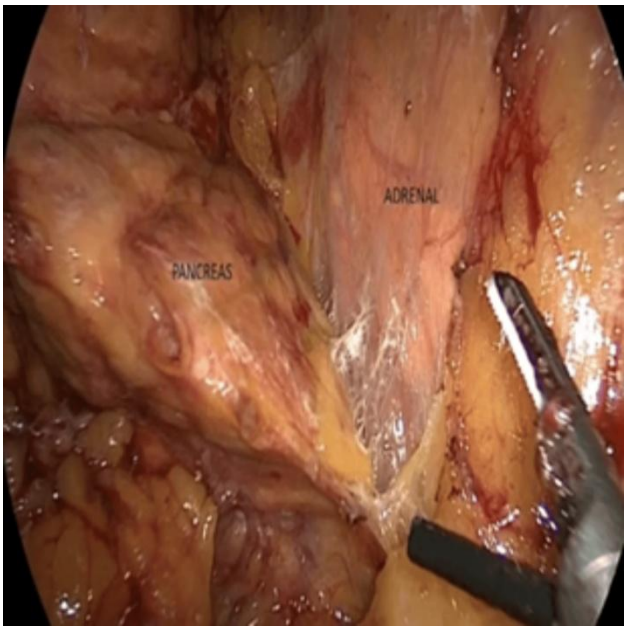

Figure 3: Per operative image showing tumor with adjacent structures.

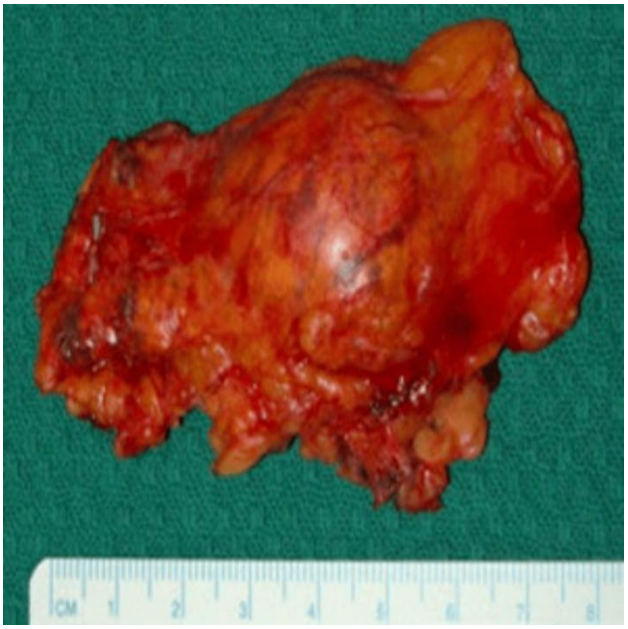

Figure 4: Enbloc removal of tumor.

The postoperative course was uneventful. The patient remained hemodynamically stable and required no hormonal replacement therapy. She was discharged on postoperative day three.

Gross examination of the resected specimen revealed a well-encapsulated, firm, tan-white mass measuring 7×7 cm. On cut section, the tumor was solid with a homogeneous appearance, lacking areas of hemorrhage or necrosis. Microscopic evaluation demonstrated spindle-shaped cells arranged in interlacing fascicles, characteristic of Antoni A and Antoni B areas (Figure 5). Verocay bodies were identified, confirming the Schwann cell origin. Immunohistochemical staining showed strong and diffuse positivity for S-100 protein, consistent with a diagnosis of schwannoma. There was no evidence of malignancy, such as increased mitotic activity, nuclear atypia, or necrosis. The adjacent adrenal tissue was unremarkable, and the excised lymph node showed reactive changes without metastatic involvement.

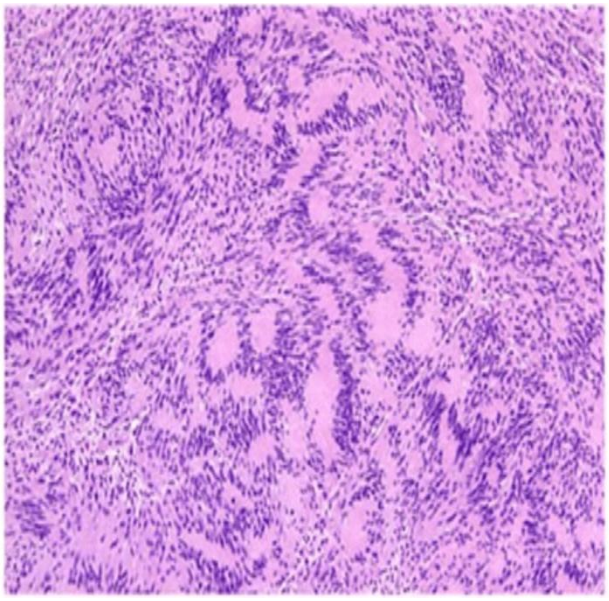

Figure 5: Microscopic examination showing Antoni A and B bodies.

DISCUSSION

Adrenal schwannomas are rare benign tumors representing a very small fraction of adrenal neoplasms.[1,2] With increasing use of cross-sectional imaging, adrenal incidentalomas are detected more frequently; however, schwannomas remain an uncommon etiology.[3]

Clinically, these tumors are usually asymptomatic and non-functional. When present, symptoms are typically related to mass effect and are nonspecific, such as abdominal discomfort.[2,4] Endocrinological evaluation is generally normal.

Radiologically, adrenal schwannomas appear as well-defined, encapsulated masses with variable enhancement patterns. Degenerative changes such as cystic areas or calcifications may be present. However, imaging findings significantly overlap with pheochromocytoma, adenoma, and adrenocortical carcinoma, making preoperative diagnosis unreliable.[1,5,6]

Definitive diagnosis depends on histopathological and immunohistochemical analysis. Characteristic findings include Antoni A and B areas, Verocay bodies, and strong S-100 positivity.[2,5,7]

Surgical excision is recommended for adrenal masses larger than 4 cm or those with indeterminate imaging features due to the inability to exclude malignancy preoperatively. Laparoscopic adrenalectomy is considered safe and effective for appropriately selected patients.[8] Prognosis after complete resection of benign adrenal schwannoma is excellent, with no reported recurrences in available literature.[2,7,9]

CONCLUSION

Adrenal schwannoma is an exceptionally rare benign tumor that presents significant diagnostic challenges due to nonspecific clinical and radiological features. Preoperative differentiation from malignant adrenal tumors is often not possible. Histopathological examination remains the gold standard for definitive diagnosis. Surgical excision is both diagnostic and curative, with excellent outcomes. Awareness of this rare entity is important when evaluating non-functional adrenal incidentalomas.

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REFERENCES

1. Suzuki K, Nakanishi A, Kurosaki Y, Nogaki J, Takaba E. Adrenal schwannoma: CT and MRI findings. Radiat Med. 2007;25(6):299-302.
2. Garg S, Mathew M, Goel T. Adrenal schwannoma: a case report and review of literature. Indian J Pathol Microbiol. 2007;50(3):587-8.
3. Goh BK, Tan YM, Chung YF, Chow PK, Ooi LL, Wong WK. Retroperitoneal schwannoma. Am J Surg. 2006;192(1):14-18.
4. Kinoshita T, Naganuma H, Ishii K, Itoh H. CT features of retroperitoneal neurilemmoma. Eur J Radiol. 1998;27(1):67-71.
5. Rizk RC, Yasrab M, Chu LC, Weisberg EM, Fishman EK. An incidental large adrenal schwannoma: a case report. Radiol Case Rep. 2024;19(7):3008-12.
6. Adas M, Ozulker F, Adas G, Koc B, Ozulker T, Sahin IM. A rare adrenal incidentaloma: adrenal schwannoma. Case Rep Gastroenterol. 2013;7(3):420-7.
7. Wilson MP, Katlariwala P, Huang J, Low G, Wiebe E. Benign adrenal and suprarenal retroperitoneal schwannomas can mimic aggressive adrenal malignancies: case report and review of the literature. Intract Rare Dis Res. 2020;9(3):156-62.
8. Anukoolphaiboon A, Attawettayanon W, Innachit P. Adrenal schwannoma treated with laparoscopic adrenalectomy: a case report and literature review. PSU Med J. 2023;26(2):151-6.
9. Janjua A, Sarwar MZ, Naqi SA. Adrenal schwannoma: a case report. Int Med Case Rep J. 2021;14:617-20.

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