

Retroperitoneal Cystic Masses: Three Challenging Cases Managed Surgically

Diogo Dias¹, Daniel Costa¹, Rui Almeida Pinto¹, João Silva¹.

Abstract

Aims to present three cases of retroperitoneal cystic lesions treated with surgery.

A 41-year-old female was referred for a palpable abdominal mass and postprandial bloating. Magnetic resonance imaging (MRI) showed a simple retroperitoneal cystic lesion measuring 14 cm.

An 82-year-old female was referred after a computed tomography (CT) scan showed a retroperitoneal cystic mass measuring 11 cm, with a 42 mm nodular area showing contrast enhancement and exerting a mass effect.

A 75-year-old male was referred for a suspected right adrenal gland lesion on CT scan. The lesion was a retroperitoneal cystic mass measuring 10.4 cm in diameter, with apparent involvement of the right adrenal gland, causing mass effect. Metaiodobenzylguanidine scintigraphy scan showed no uptake of ¹²³I-MIBG.

The patient in C1 underwent laparoscopic excision of the lesion, with histopathological examination revealing a cystic lymphangioma. The patient in C2 underwent excision of the lesion with the adrenal gland. Histopathological analysis revealed a well-differentiated liposarcoma, with free margins. The patient in C3 underwent open adrenalectomy, and the histopathological study confirmed the lesion to be an adrenal hemangioma.

Surgery served a diagnostic and therapeutic role, enabling appropriate follow-up care for each patient.

Keywords: Cysts/diagnostic imaging; Cysts/surgery; Retroperitoneal Space.

Introduction

Retroperitoneal cystic lesions are rare entities.¹ They may be incidentally discovered during imaging studies performed for other reasons or may present symptomatically due to mass effect on adjacent structures. These lesions typically become symptomatic only when they reach significant dimensions. Symptoms are generally vague abdominal pain and abdominal distension. The differential diagnosis is broad,² encompassing both benign and malignant lesions.³ Thus, retroperitoneal cystic lesions pose a clinical, diagnostic, and therapeutic challenge.⁴ This

article aims to describe 3 clinical cases of patients with retroperitoneal cystic lesions who were referred to Urology and treated surgically.

Case Report

Case 1 (C1):

A 41-year-old woman with a history of left nephrectomy at age 29 due to functional exclusion caused by ureteropelvic junction syndrome was referred to a urology consultation by her family doctor. She reported postprandial bloating and presented with a palpable abdominal mass in the left quadrant, leading to an abdominal computed tomography (CT).

On physical examination, the patient was in good general health, with a notable finding of a palpable, painless mass in the left abdominal quadrants. Given her medical history, an abdominal magnetic resonance imaging (MRI) was requested, which revealed a simple retroperitoneal cystic lesion on the left side, measuring 14 cm in diameter, causing displacement of intestinal loops and the corresponding mesentery (Fig. 1).

Case 2 (C2):

An 82-year-old woman with a history of hypertension,

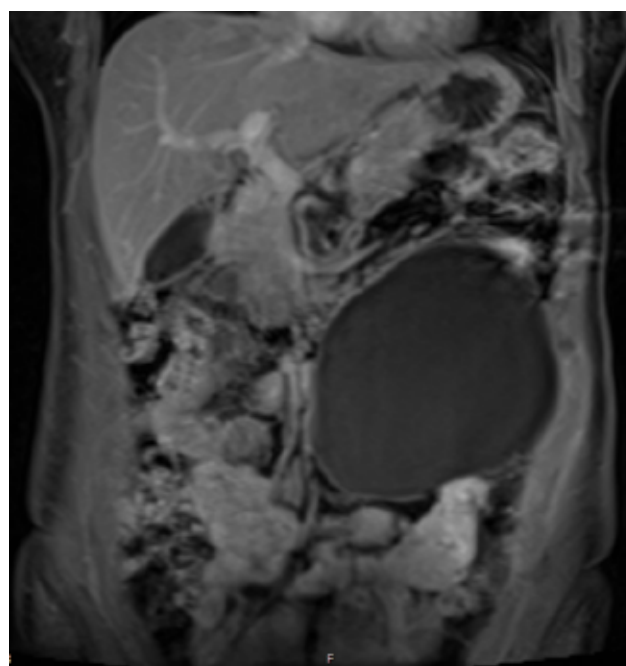


Figure 1 - Coronal section on MRI showing a simple retroperitoneal cystic lesion with mass effect.

1 - Urology Department, São João Health Unit, Porto, Portugal.

DOI - <https://doi.org/10.24915/aup.283>

managed with azilsartan 20 mg, and previous surgeries for cholecystectomy and appendectomy, was referred to urology consultation due to an incidental finding on an abdominal CT scan of a retroperitoneal mass. The CT scan revealed a cystic lesion measuring 11 cm in diameter, located in the left retroperitoneum, with a 42 mm nodular area showing contrast uptake and exerting a mass effect on the ipsilateral kidney and adrenal gland (Fig. 2). The patient was asymptomatic and in good



Figure 2 - Coronal section on CT showing a left retroperitoneal lesion with a nodular area with contrast enhancement.

general condition, with a notable palpable mass in the left abdominal quadrants upon physical examination. To rule out pheochromocytoma, urinary and serum catecholamines were measured and found to be normal.

Case 3 (C3):

A 75-year-old man was referred to a urology consultation due to a suspected right adrenal gland lesion identified on a CT scan. His medical history included hypertension, type 2 diabetes mellitus, dyslipidemia and obesity, managed with amlodipine, perindopril, metformin and rosuvastatin. The CT scan revealed a retroperitoneal cystic mass measuring 10.4 cm in diameter, apparently originating from the right adrenal gland, exerting a mass effect on the right kidney and liver (Fig. 3). Metabolic studies showed elevated urinary metanephrines. Metaiodobenzylguanidine (MIBG) scintigraphy scan showed no uptake of ^{123}I -MIBG.

The C1 patient underwent laparoscopic excision of the lesion via a transperitoneal approach (Fig. 4). The



Figure 3 - Coronal section on CT scan showing a right retroperitoneal lesion with mass effect against the liver. On the left side, a simple renal cyst is visible.



Figure 4 - Surgical specimen (Case 1).

postoperative period was uneventful, and the patient was discharged on the second day. Histological analysis of the surgical specimen revealed a cystic lymphangioma. At the postoperative follow-up appointment, the patient was asymptomatic, with a well-healed surgical wound. The C2 patient underwent surgical excision of the lesion via an open transperitoneal approach. Due to difficulty separating the lesion from the adrenal

gland, adrenalectomy was required. The macroscopic appearance of the surgical specimen is shown in Fig. 5. The postoperative period was uneventful, and the patient was discharged on the fourth day. Histological examination revealed a retroperitoneal mesenchymal neoplasm consistent with a well-differentiated inflammatory subtype liposarcoma, grade 1 (Fédération Nationale des Centers de Lutte Contre le Cancer - FNCLCC)⁵ with a 14.5 cm diameter and free margins. At the postoperative follow-up appointment, the patient was asymptomatic and had good healing of the surgical wound. The patient is currently under follow-up with the sarcoma treatment group, with no evidence of recurrence to date.

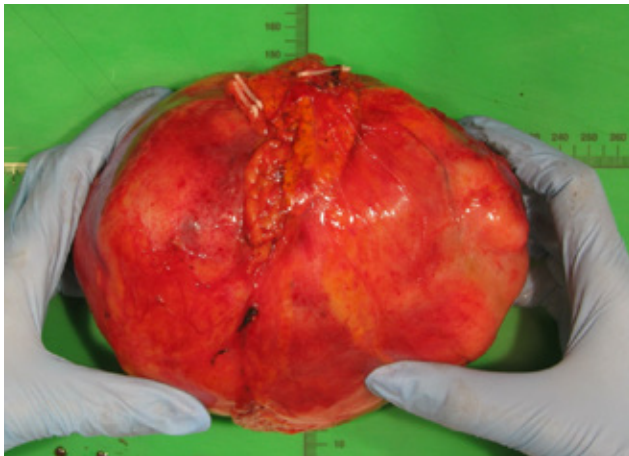


Figure 5 - Surgical specimen (Case 2).

The C3 patient underwent an open transperitoneal adrenalectomy. The surgical specimen is shown in Fig. 6. The postoperative period was uneventful, and he was discharged on the fourth day. Histological examination confirmed the diagnosis of an adrenal hemangioma with cystic degeneration. At the postoperative follow-up appointment, the patient was asymptomatic, with good surgical wound healing.

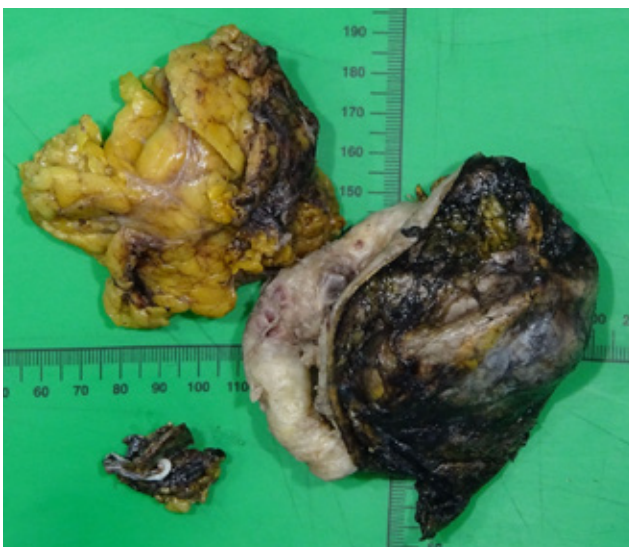


Figure 6 - Surgical specimen (Case 3).

Discussion

Retroperitoneal cystic lesions represent a clinical challenge.⁴ Although rare, their detection has increased due to the growing use of imaging studies such as CT scans.¹ The diagnostic workup involves taking a thorough medical history, performing a physical examination, conducting laboratory studies, and utilizing imaging modalities like CT and sometimes MRI. Despite the availability of these diagnostic tools, an adequate classification of these lesions is not always possible.⁶ The decision to proceed with surgical removal depends on factors such as the presence of symptoms or the malignant potential of the lesion.⁶

Lymphangiomas are rare benign lesions that arise from congenital malformations of lymphatic vessels, leading to obstruction and subsequent lymphangiectasia. They most commonly present within the first two years of life, with the neck, head, and axillae being the most frequent locations. Abdominal lymphangiomas are rare,⁷ with most occurring in the retroperitoneum or mesentery.⁸ They are generally asymptomatic and discovered incidentally on imaging studies. When symptoms occur, they are typically due to mass effect or complications such as rupture or infection.⁸ Radical surgical resection is the recommended treatment for abdominal lymphangiomas.⁷

Retroperitoneal liposarcoma is a rare malignant tumor.⁹ With an incidence of 2.5 per million. These tumors are typically asymptomatic until they grow large enough to exert a mass effect. Treatment involves surgical resection, and complete removal significantly improves five-year survival rates.¹⁰

Adrenal hemangiomas are extremely rare lesions first described in 1955. These benign tumors originate from endothelial cells. They may be completely asymptomatic and incidentally discovered on imaging studies, or they may present with nonspecific abdominal pain. Most are non-functioning, and surgical resection is recommended for lesions larger than 3.5 cm due to their propensity for bleeding and the difficulty in excluding malignancy.¹¹

In the three presented cases, adequate lesion classification was impossible. For this reason, the patients underwent surgical excision. Surgery not only allowed for removing the lesions but also enabled a definitive diagnosis through histological examination of the surgical specimens.

Conclusion

These three cases represent three distinct clinical entities that presented in the same way: retroperitoneal cystic masses identified incidentally on imaging studies in asymptomatic patients or with mild symptoms. These cases highlight the importance of surgical removal of retroperitoneal cystic lesions when their nature

cannot be adequately determined through available diagnostic tools. In these three cases, surgery played both a diagnostic and therapeutic role, enabling the establishment of the most appropriate follow-up for each patient.

Ethical Disclosure

Conflicts of Interest: The authors have no conflicts of interest to declare.

Financing Support: This work has not received any contribution, grant or scholarship.

Confidentiality of Data: The authors declare that they have followed the protocols of their work center on the publication of patient data.

Patient Consent: Consent for publication was obtained.

Provenance and Peer Review: Not commissioned; externally peer-reviewed.

References

1. Yang DM, Jung DH, Kim H, Kang JH, Kim SH, Kim JH, et al. Retroperitoneal cystic masses: CT, clinical, and pathologic findings and literature review. *Radiographics*. 2004;24:1353-65. doi: 10.1148/rg.245045017.
2. Hegazi TM, Al-Sharydah AM, Lee KS, Mortelet K. Retroperitoneal cystic masses: magnetic resonance imaging features. *Abdom Radiol*. 2020;45:499-511. doi: 10.1007/s00261-019-02246-2.
3. Sassa N. Retroperitoneal tumors: Review of diagnosis and management. *Int J Urol*. 2020;27:1058-70. doi: 10.1111/iju.14361.
4. Morotti A, Busso M, Barozzino MC, Cinardo P, Angelino V, Familiari U, et al. Detection and management of retroperitoneal cystic lesions: A case report and review of the literature. *Oncol Lett*. 2017;14:1608. doi: 10.3892/ol.2017.6323.
5. Khoury JD, Coffin CM, Spunt SL, Anderson JR, Meyer WH, Parham DM. Grading of Non-Rhabdomyosarcoma Soft Tissue Sarcoma in Children and Adolescents: A Comparison of Parameters Used for the FNCLCC and POG systems. *Cancer*. 2010;116:2266.
6. Renzulli P, Candinas D. Symptomatic Retroperitoneal Cyst: A Diagnostic Challenge. *Ann R Coll Surg Engl*. 2009;91:W9.
7. Di Marco M, Grassi E, Vecchiarelli S, Durante S, Macchini M, Biasco G. Retroperitoneal lymphangioma: A report of 2 cases and a review of the literature regarding the differential diagnoses of retroperitoneal cystic masses. *Oncol Lett*. 2016;11:3166.
8. Ghatak S, Ray S, Sanyal S, Sonar PK, Khamrui S, Basu K, et al. An unusual cause of acute abdomen in adults: giant cystic lymphangioma of the pancreatic head. A clinical case and literature review. *JOP*. 2011;12:266-70.
9. Tripathi M, Pavithira GJ, Dubey S, Verma R, Garg V. Surgical excision of a giant retroperitoneal liposarcoma with renal cell carcinoma: A case report of the largest retroperitoneal sarcoma. *Int J Surg Case Rep*. 2023;109:108515. doi: 10.1016/j.ijscr.2023.108515.
10. Zhang WD, Liu DR, Que RS, Zhou CB, Zhan CN, Zhao JG, et al. Management of retroperitoneal liposarcoma: A case report and review of the literature. *Oncol Lett*. 2015;10:3161-6.
11. Wang L, Dang Y, He R, Chen G. Rare cavernous hemangioma of adrenal gland: case report. *Sao Paulo Med J*. 2014;132:249-52.

Contributorship Statement

All authors contributed to this work, approved the final version of the manuscript for publication, and agree to be accountable for all aspects of the work, ensuring the accuracy and integrity of the data presented.

Corresponding Author

Diogo Dias

Urology Department, São João Health Unit, Alameda Prof. Hernâni Monteiro, 4200-319 Porto

E-mail: tavaresdias97mail.com

ORCID: <https://orcid.org/0009-0001-8954-8261>

Received: 2026-04-11

Accepted: 2026-06-02

Published online: 2026-10-23

Published:

© 2026 APU Journal. This is an open-access article under the CC BY-NC 4.0. Re-use permitted under CC BY-NC 4.0. No commercial re-use.