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## Case Report

# Retroperitoneal cystic schwannoma mimics liquefied hematoma<sup>☆</sup>

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## ABSTRACT

Schwannomas are nerve sheath tumors that seldom occur in the retroperitoneal region. Herein, we describe an incidentally detected retroperitoneal schwannoma that mimicked liquefied hematoma on computed tomography. A 61-year-old man was admitted to the emergency department with chest pain caused by a fall at a construction site. Chest computed tomography incidentally revealed a retroperitoneal cystic mass measuring 10 cm, in addition to multiple rib fractures and hemopneumothorax. The patient frequently consumed alcohol and had a history of repeated trauma; therefore, we considered the following 2 conditions: retroperitoneal cystic tumor and liquefied hematoma. He underwent complete surgical excision, and a histopathological examination confirmed the mass as a schwannoma. Experience and knowledge regarding the computed tomography findings of retroperitoneal cystic schwannoma are useful for the differential diagnosis of infrequent retroperitoneal tumors.

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## Introduction

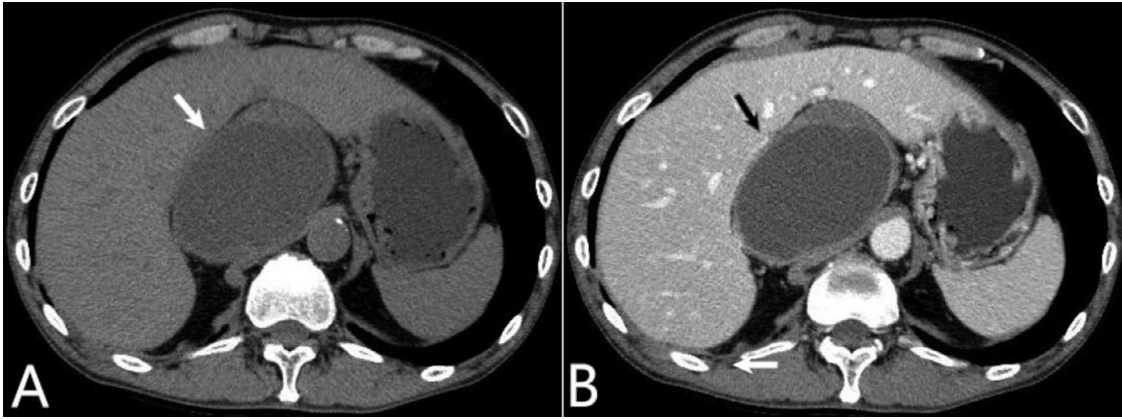
Schwannomas are typically benign tumors that originate from the Schwann cells of the nerve sheath. These neoplasms usually affect the nerves in the head, neck, and flexor surfaces of the extremities [1]. Retroperitoneal location is infrequent and accounts for approximately 3% of all schwannomas [2]. Retroperitoneal schwannomas are predominant in cystic degeneration than those in other sites [3]. Herein, we present a case of a retroperitoneal cystic schwannoma, which required differentiation from traumatic liquefied hematoma.

<sup>☆</sup> Competing Interests: None.

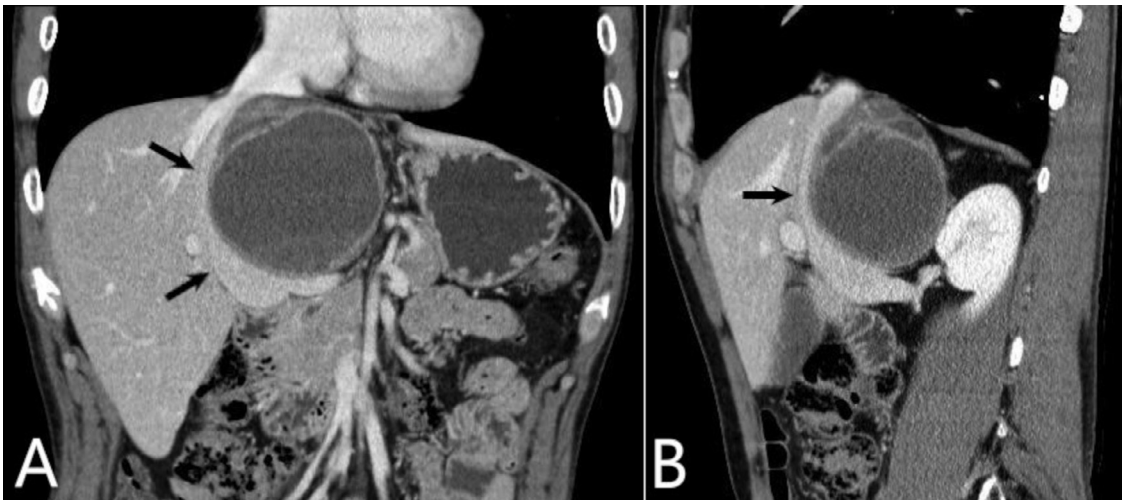
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## Case report

A 61-year-old man presented to the emergency department of our hospital with chest pain after a 3-m fall while working at a construction site. He frequently consumed alcohol and had a history of repeated trauma. A physical examination revealed tenderness in the right chest wall, right periorbital swelling, and laceration of the right foot. The abdomen was generally soft. Laboratory examinations revealed elevated creatine kinase of 637 IU/L [reference range; 55–170 IU/L], glutamic oxaloacetic transaminase of 143 IU/L [reference range; 0–40 IU/L], and total bilirubin of 1.8 mg/dL [reference range: 0.2–1.2 mg/dL]. Chest computed tomography (CT) revealed multiple right rib fractures and a hemopneumothorax. We incidentally observed a mass posterior to the liver on



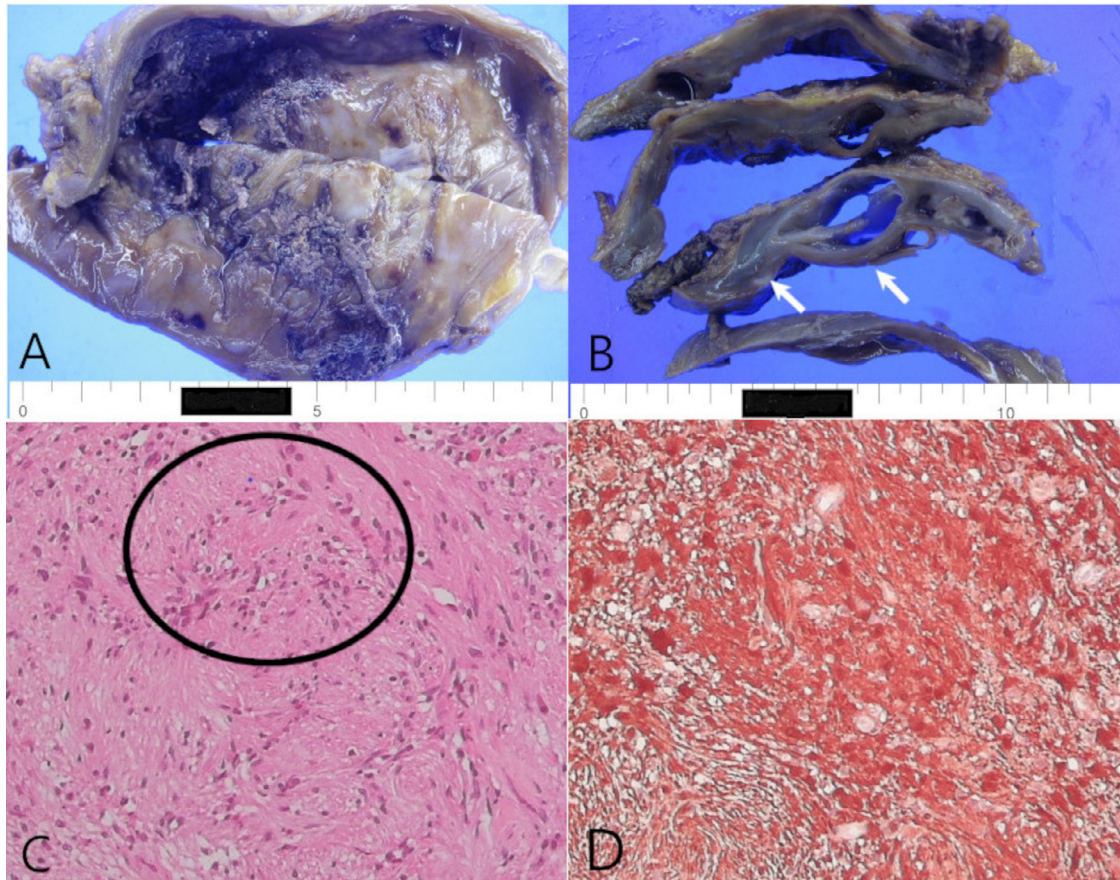
**Fig. 1** – Axial computed tomography scans reveals a distinct ovoid cystic mass between the liver and the right diaphragmatic crus.



**Fig. 2** – (A, B). On contrast-enhanced coronal and sagittal computed tomography scans, the mass has compressed and displaced the inferior vena cava lateral anteriorly. Fluid-fluid level has been observed within the mass (A). Particular septa-like structures are located superior to the aspect of the mass (A and B).

the chest CT. Therefore, he underwent an additional abdominal CT examination. On the axial CT scans, we observed a distinct ovoid, peripherally mildly enhancing low-density mass measuring 10 cm in the retroperitoneal space (Fig. 1A and B). It was located posterior to the liver, and the inferior vena cava (IVC) was compressed and displaced anteriorly (Fig. 2A and B). Fluid-fluid levels were observed within the mass (Fig. 2A). Moreover, we observed some septa-like structures on the superior aspect of the mass (Fig. 2A and B). The lesion was presumably a trauma-related liquefied hematoma or retroperitoneal cystic neoplasm. The patient underwent exploratory laparotomy. Intraoperatively, the mass was attached to the IVC; therefore, we initially performed IVC clamping, followed by mass removal. IVC reconstruction was performed after completely resecting the mass. The gross specimen revealed a cystic

mass measuring 10 cm × 8 cm × 4 cm. The inner surface was covered with a dark brownish exudate (Fig. 3A). On the cut surface, the cystic mass had a thick, whitish, and myxoid wall, with multilocular cystic changes (Fig. 3B). Histopathological examinations revealed that the solid portion of the mass consisted of proliferating spindle cells that formed Verocay bodies in particular regions. Verocay bodies are components of Antoni A, which are dense areas of schwannomas located between the palisading spindle cells. Two nuclear palisading regions and an anuclear zone comprised one Verocay body (Fig. 3C). Immunohistochemistry revealed strong and diffuse S100 protein staining (Fig. 3D). Pathological examinations revealed that the mass was a benign schwannoma. The postoperative course was uneventful and the patient was discharged.



**Fig. 3 – (A) A gross specimen reveals a cystic mass measuring 10 × 8 × 4 cm. (B) On the cut surface, the wall of cystic mass is thick-whitish and myxoid with multilocular cystic changes (arrows). (C) Microscopic examination reveals the proliferation of spindle cells, which form the Verocay body (circle, hematoxylin and eosin stain, ×100). (D) Immunohistochemistry reveals the strong and diffuse staining of the S100 protein (×100).**

## Discussion

Schwannomas are neurogenic tumors derived from the Schwann cells of the nerve sheath. They are usually diagnosed in patients aged between 40 years and 60 years, with a 2:3 ratio between men and women [3,4]. Schwannomas are usually benign and solitary tumors. Malignant transformation is exceptional unless associated with type 2 neurofibromatosis, which accounts for 60% of the cases [1,2].

Retroperitoneal schwannomas are infrequent and usually larger than those of the head, neck, and extremities. They display a greater tendency to undergo spontaneous degeneration and hemorrhage than tumors in other sites [3,5]. Tumors that have undergone degenerative changes, such as cyst formation, hemorrhage, calcification, and hyalinization, are termed ancient schwannomas, similar to that in our case.

It is difficult to diagnose a retroperitoneal schwannoma. The symptoms are nonspecific, and neurologic symptoms are uncommon [3,5]. Therefore, the lesions are frequently discovered incidentally, as in our case.

Radiological examinations play a major role in the diagnosis. CT and magnetic resonance imaging (MRI) are the 2

modalities of choice for retroperitoneal tumors. A CT scan reveals a distinct low-attenuation mass, compared with soft tissue (muscle) owing to the components of myelin and fat [2,6]. MRI is superior to CT in identifying the internal compositions of the lesion and the nerve origin [2]. Schwannomas are usually hypointense and hyperintense on T1- and T2-weighted images, respectively [6].

Differential diagnoses with retroperitoneal schwannomas include neurofibroma, paraganglioma, pheochromocytoma, liposarcoma, and malignant fibrous histiocytoma [5]. In addition, they should include lymphangioma and hematoma for the cystic degeneration of the retroperitoneal schwannoma, as in our case [5]. Moreover, cystic degeneration is the strongest indicator for an ancient schwannoma than that for other retroperitoneal tumors [7].

The therapeutic approach for retroperitoneal schwannomas remains debatable among clinicians because of low local recurrence and relatively lower malignant transformation [8]. However, retroperitoneal schwannomas are difficult to diagnose preoperatively, thus warranting surgical resection for the diagnosis and treatment.

The final diagnosis was based on a histopathological examination. Schwannomas are composed of Schwann cells with

regions of compact (Antoni A) and loose cellular areas (Antoni B). Immunohistochemically, tumor cells strongly and diffusely express the S-100 protein.

Retroperitoneal schwannomas display good prognosis following complete surgical excision [3].

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## Conclusion

Experience and knowledge regarding the CT findings of retroperitoneal cystic schwannomas are useful for the differential diagnosis of infrequent retroperitoneal tumors.

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## Patient consent

Consent for publication has been obtained.

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## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.radcr.2022.09.096](https://doi.org/10.1016/j.radcr.2022.09.096).

## REFERENCES

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- [1] Debaibi M, Sghair A, Sahnoun M, Zouari R, Essid R, Kchaou M, et al. Retroperitoneal schwannoma: uncommon location of a benign tumor. *Clin Case Rep* 2022;10(4):e05726. doi:[10.1002/ccr3.5726](https://doi.org/10.1002/ccr3.5726).
- [2] Harhar M, Ramdani A, Bouhout T, Serji B, El Harroudi T. Retroperitoneal schwannoma: two rare case reports. *Cureus* 2021;13(2):e13456. doi:[10.7759/cureus.13456](https://doi.org/10.7759/cureus.13456).
- [3] Çalışkan S, Gümrükçü G, Kaya C. Retroperitoneal ancient schwannoma: a case report. *Rev Urol* 2015;17(3):190–3. doi:[10.3909/riu0638](https://doi.org/10.3909/riu0638).
- [4] Cury J, Coelho RF, Srougi M. Retroperitoneal schwannoma: case series and literature review. *Clinics (Sao Paulo)* 2007;62:359–62. doi:[10.1590/S1807-59322007000300024](https://doi.org/10.1590/S1807-59322007000300024).
- [5] Goh BK, Tan YM, Chung YF, Chow PK, Ooi LL, Wong WK, et al. Retroperitoneal schwannoma. *Am J Surg* 2006;192(1):14–18. doi:[10.1016/j.amjsurg.2005.12.010](https://doi.org/10.1016/j.amjsurg.2005.12.010).
- [6] Dublin AB, Dedo HH, Bridger WH. Intranasal computed schwannoma: magnetic resonance and computed tomography appearance. *Am J Otolaryngol* 1995;16(4):251–4. doi:[10.1016/0196-0709\(95\)90152-3](https://doi.org/10.1016/0196-0709(95)90152-3).
- [7] Najmi N, Akduman EI. Retroperitoneal ancient schwannoma. *Appl Radiol*. 2021;50(6):45–7.
- [8] Hoarau N, Slim K, Da Ines D. CT and MR imaging of retroperitoneal schwannoma. *Diagn Interv Imaging* 2013;94(11):1133–9. doi:[10.1016/j.diii.2013.06.002](https://doi.org/10.1016/j.diii.2013.06.002).