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**Case Report**

# Laparoscopic Management of Large Right Adrenal Teratoma Adherent to Inferior Vena Cava: A Rare Case Report

**Shakti Kumar Chaudhary[1], Shashikant Gupta[2], Kavita Somani[3], Pretty Singh[4]**

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## ABSTRACT

Primary adrenal teratoma is a rare germ cell tumor that can mimic common adrenal lesions, posing a diagnostic challenge. We report a 41-year-old female with an incidentally discovered 8 cm right adrenal mass. Contrast-enhanced CT showed macroscopic fat, coarse calcifications, and a fat-fluid level. Hormonal evaluation was negative. The patient underwent laparoscopic right adrenalectomy, which was uneventful. Histopathology confirmed a mature cystic teratoma. This case emphasizes characteristic imaging features that aid preoperative diagnosis and supports the feasibility of minimally invasive adrenalectomy, even for large and complex adrenal masses.

## KEYWORDS

• Adrenal Gland • Teratoma • Laparoscopic Adrenalectomy • Incidentaloma • Fat-containing adrenal mass

**Author's Affiliation:**

[1] Senior Resident, Department of Urology and Kidney Transplant Surgery, Apollomedics Superspeciality Hospitals Lucknow, Uttar Pradesh, India.

[2] Associate Director, Department of Urology and Kidney Transplant Surgery Apollomedics Superspeciality Hospitals Lucknow, Uttar Pradesh, India.

[3] Chairperson and Director, Department of Pathology Apollomedics Superspeciality Hospitals Lucknow, Uttar Pradesh, India.

[4] Associate Director, Department of Pathology Apollomedics Superspeciality Hospitals Lucknow, Uttar Pradesh, India.

**Corresponding Author:**

**Shakti Kumar Chaudhary,** Senior Resident, Department of Urology and Kidney Transplant Surgery, Apollomedics Superspeciality Hospitals Lucknow, Uttar Pradesh, India.

**E-mail:** Siya.radhekrishna@gmail.com

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## INTRODUCTION

Primary adrenal teratoma is an exceedingly rare neoplasm, representing a small fraction of extragonadal germ cell tumors.[1] The majority of these tumors are found incidentally during imaging for unrelated reasons and are most often hormonally inactive. The presence of macroscopic fat on computed tomography (CT) often leads to a presumptive diagnosis of the more common adrenal myelolipoma, the primary radiological mimic.[2] However, specific imaging characteristics can increase the preoperative suspicion for teratoma, which is crucial for appropriate surgical planning. We present the case of a 41-year-old female with a large adrenal teratoma exhibiting classic radiological signs, who was successfully managed with laparoscopic surgery.

## CASE HISTORY

A 41-year-old female was incidentally found to have a right adrenal mass during routine imaging. She was asymptomatic, with no history of hypertension, virilization, or constitutional symptoms. Her hormonal evaluation, including plasma free metanephrins and normetanephrins, was within normal limits, confirming a non-functional adrenal mass. Contrast-enhanced CT revealed a lobulated, predominantly fat-density lesion measuring 8x6x7 cm arising from the right adrenal gland. The mass contained fat-fluid levels and irregular wall calcifications. A minimally enhancing soft tissue component measuring 3x2.5 cm was seen anteromedially. The mass was indenting the posterior surface of the IVC and abutting the superior pole of the right kidney (Figure 1A). The patient underwent a right laparoscopic adrenalectomy. The operation lasted approximately 2 hours with an estimated blood loss of 50 mL. Dense adhesions were noted between the tumor and the IVC, as well as the posterior abdominal wall and musculature. The mass was excised laparoscopically with minor spillage of fat-fluid contents. No intraoperative complications occurred. The postoperative period was uneventful. The patient was mobilized early and discharged on postoperative day two. Gross examination of the resected specimen revealed a cystic-solid adrenal mass with visible hair tufts (Figure 1B). Histological analysis of the adrenal mass showing a mature cystic teratoma. The section reveals well-differentiated tissues from all three germ layers, including sebaceous glands and neuroglial tissue (ectoderm), cartilage (mesoderm), and respiratory epithelium (endoderm), confirming a benign diagnosis (Figure 1C).

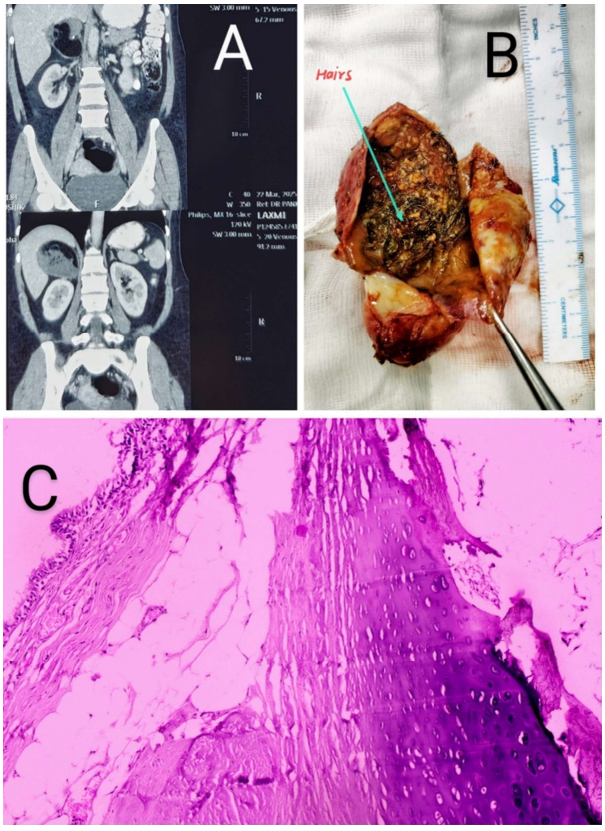


**Figure 1: A)** CT showing a fat-density adrenal mass with calcifications, **B)** Gross specimen with fat and hair **C)** H&E reveals mature cystic teratoma with ectodermal, mesodermal, and endodermal derivatives

## DISCUSSION

This case exemplifies the classic presentation of a primary adrenal teratoma: a large, asymptomatic, non-functional incidentaloma in an adult female. The key learning point is the importance of radiological features in the preoperative diagnosis. While myelolipoma is the most frequent diagnosis for a fat-containing adrenal mass, the concurrent presence of coarse calcifications and fat-fluid levels should strongly raise suspicion for a teratoma.[3]

Surgical resection is the cornerstone of treatment for all primary adrenal teratomas to provide a definitive diagnosis and mitigate the risk of occult malignancy or future malignant transformation.[1] Laparoscopic adrenalectomy is the preferred approach for the majority of benign adrenal tumors, offering significant

patient benefits such as reduced pain, shorter hospital stays, and faster recovery.[4] This case demonstrates that even for large tumors (>6 cm) with dense adhesions to major structures like the IVC, a laparoscopic approach is feasible and safe in experienced hands, consistent with emerging trends in minimally invasive surgery.[5] The prognosis for patients with a completely resected mature teratoma is excellent, with survival rates approaching 100% and a very low risk of recurrence. Primary adrenal teratoma should be considered in the differential diagnosis of any large, fat-containing adrenal mass, especially when accompanied by coarse calcifications and fat-fluid levels. A thorough, negative hormonal workup is essential. Laparoscopic adrenalectomy is a safe and effective treatment even for large and complex tumors, providing definitive diagnosis and cure for benign variants like mature cystic teratoma.

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