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**Laparoscopy**
*Case report*

# Laparoscopic excision of a large symptomatic and kidney-displacing adrenal myelolipoma: A case report

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**KEYWORDS**
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**Abstract**
*Introduction:* Adrenal myelolipoma is a rare tumor. Traditionally, open surgical adrenalectomy was the standard treatment for symptomatic myelolipoma. However, laparoscopic excision is a promising alternative approach.
*Observation:* A 38-year-old obese male patient presented with right loin pain of many months duration. Imaging studies revealed a large well-defined high fat content right adrenal mass displacing the right kidney. Adrenal tumor markers were within normal suggesting a non-functioning lesion. In spite of some technical difficulties and adjustments, laparoscopic excision was done, successfully, with uneventful recovery and short convalescence. Histopathological examination described mature adipose tissue with myeloid cells and confirmed the diagnosis of adrenal myelolipoma.
*Conclusions:* Laparoscopic excision of large adrenal myelolipoma may indicate some technical adjustments, but it seems to be a feasible and advantageous approach even in obese patients.



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## Introduction

Adrenal myelolipoma is a rare adrenal tumor with a commonly reported very low frequency of 0.08%–0.2% [1]. However, this frequency seems to be progressively increasing in the last years to reach 10–15%. This increase is attributed to the advancement in imaging modalities [2,3]. Adrenal myelolipoma is usually of small size (<5 cm) and asymptomatic tumor. Also, large sizes may be discovered accidentally [4]. It is commonly diagnosed in old ages, and, mostly, without malignant potentials [1,3,5]. Biochemical activities and association with tumors in other organs of the body have been reported [6,7]. Here, we present a case of kidney displacing adrenal myelolipoma which was managed via the laparoscopic approach.

## Case report

A 38-year-old male patient presented with right loin pain of undetermined character for few months duration. On physical examination, he was obese with a body mass index of 32.8 kg/m$^2$. Vital signs were within normal averages including a blood pressure of 130/80 mmHg and heart rate of 78 beats/min. Few abdominal skin striae were seen in the lumbar regions, but, there were no abdominal tenderness or palpable masses. Digital rectal examination was free. Abdominal ultrasound described a hyperechoeic soft tissue mass above the upper pole of the right kidney. Computed tomography revealed a well-demarcated right adrenal mass with negative Hounsfield Unit values (Fig. 1). It was more or less heterogeneous with high adipose tissue contents. Its size was 8.6 cm × 6.3 cm at the widest dimensions. It was compressing the surrounding structures and resulted in inferior displacement of the right kidney and its rotation around the horizontal axis (Fig. 1). Laboratory adrenal tumor markers including urinary Vanillylmandelic Acid (VMA), metanephrines, and serum cortisol level were within normal. Also, values of the routine laboratory investigations including blood urea, serum creatinine, electrolytes, and complete blood count were within normal.

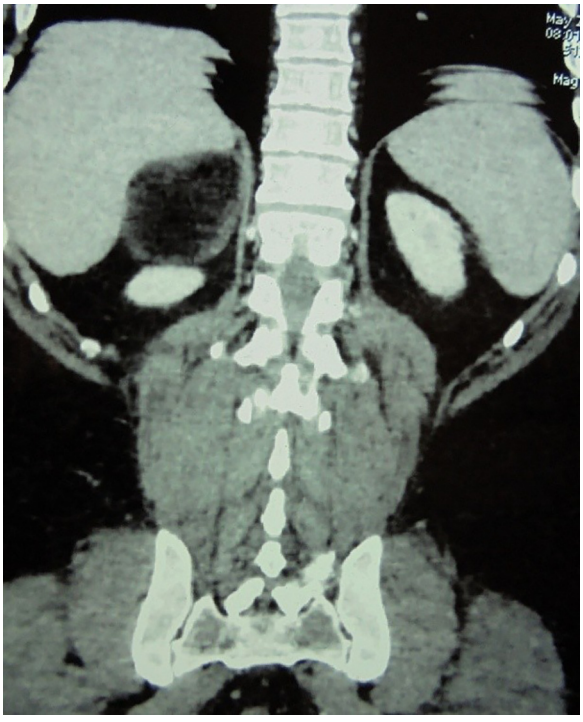

**Fig. 1** Computed tomography coronal cut: A large well-demarcated benign-featuring right adrenal mass which is inferiorly displacing the right kidney.

The clinical diagnosis was mostly adrenal myelolipoma or angiomyolipoma. Routine work up for metastasis detection via abdominal computed tomography and chest X-ray was unremarkable.

The patient had laparoscopic adrenalectomy using transperitoneal approach. He was positioned in the left semi-lateral position with elevated kidney rest. Five ports were designated at the right side of the abdomen. Two 10-mm ports were created in the midline; one was just supra-umbilical (for the laparoscopic camera) and the other was just below the xiphi-sternum. Another two 10-mm ports were created for the main working trocars; the upper one was two inches below costal margin at the mid-clavicular line and the second one was at the anterior axillary line (two inches below the level of first one). One 5-mm port was put at the mid-axillary line at a lower level than the previous ports for insertion of a retractor or grasper.

The procedure steps were carried out as creation of pneumoperitoneum, introduction of the instruments, incision of the posterior peritoneum, and reflection of the intestine. Dissection of the mass was achieved, but, it was technically demanding, especially, medially for the adrenal vein along the inferior vena cava, superiorly from the liver, and posteriorly from the abdominal wall. Also, the instrumental reach to the upper border of the mass was demanding, owing to the patient's high body mass index. However, the matter was not so difficult and complete separation of the mass was amenable.

The mass was delivered through a 4 cm extended supra-umbilical port incision. The procedure was completed in about 120 min without significant blood loss (150 ml) or complications. Postoperative course was uneventful and the patient was discharged after 3 days postoperatively.

Grossly, the excised mass was about 8.5 cm × 6.5 cm with brownish yellow color. Its cut surface was solid and homogenous with a yellow color. Histopathological microscopic examination revealed high contents of mature adipose tissue and hematopoietic cells; eosinophils, polymorphs, and megakaryocytes (Fig. 2). So, the diagnosis of adrenal myelolipoma was confirmed.

## Discussion

Adrenal myelolipoma is a rare tumor reported usually in old ages with equal incidence among males and females [5]. Our patient was relatively younger correlating to the increasing trend of case presentation in relatively young ages [2,6,8].

Adrenal myelolipoma is usually a small-sized lesion [1]. However, some cases were reported with huge sizes leading to kidney displacement [4]. The current case was relatively large enough in size to displace the right kidney around its horizontal axis by compression of the upper pole. Also, this mechanical mass effect was illustrated by Tyritzis et al. [3] and it may be the cause of abdominal pain due traction on the renal pedicle.

Adrenal myelolipoma is usually asymptomatic and discovered accidentally on imaging for other purposes, where it is known as incidentaloma [5]. When symptoms occur, however, they commonly

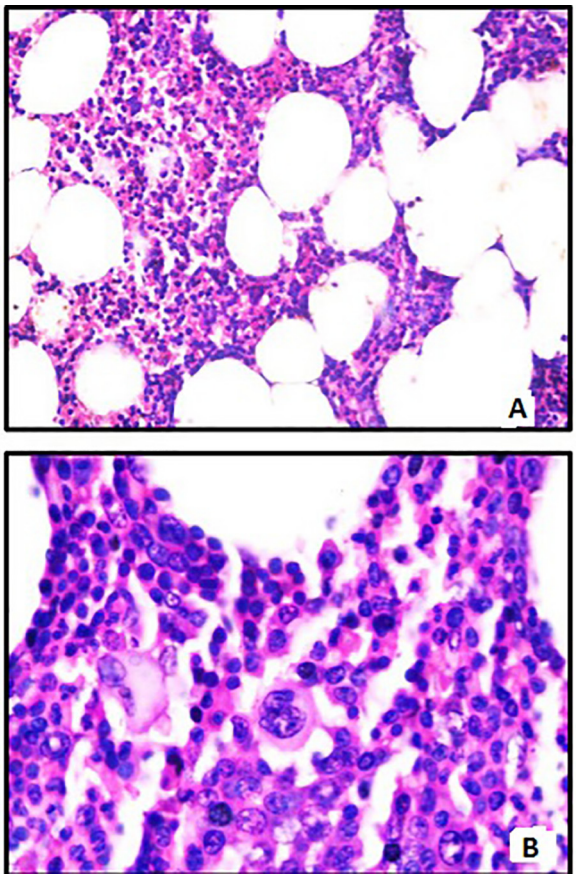


**Fig. 2** Microscopic picture. A: tissue section showing tumor components of adipose tissue and myeloid elements (X400). B: higher power showing fat cells and all three lineages of hematopoietic marrow including megakaryocyte (X1000).

include chronic upper abdominal pain [4,9], and manifestations of retroperitoneal hemorrhage [10] and biochemical tumor functions [6]. In spite of the abdominal striae, the current case lesion was benign and non-functioning myelolipoma like what have commonly been reported [1]. However, biochemically-functioning myelolipomas were reported with different clinical manifestations [6,7].

Computed tomography is a very sensitive imaging tool for diagnosis of the adrenal myelolipoma by detection of the high fat contents [4]. It makes the diagnosis easy and facilitates more incidental discovery instead of previous autopsy detection [1,5]. The high fat content appearance was a well-defined character in the current case.

Traditionally, open adrenalectomy was the standard treatment for large adrenal myelolipoma [3]. Nowadays, it is still indicated in few situations like large and hemorrhagic lesions [5,10]. However, introduction of the laparoscopic approach provided the advantages of decreased perioperative morbidities and convalescence, even in patients with large masses and obesity. Despite the increasing rate of laparoscopic excision of large adrenal myelolipomas and the associated concerns about the obesity, no specific difficulties or complications have been reported [1,8,9]. However, laparoscopic dissection may indicate some instrumental and technical adjustments during the operation such as the challenges of dissection in and instrumental reach to certain anatomical points like what was encountered in the current case. In spite of these challenges, however, dissection could be achieved without significant technical barriers. So, our case was treated successfully via laparoscopic excision in an obese patient with a relatively large mass and without complications. Also, hospital stay, wound pain and need to analgesia were significantly better.

The current case had prominent characters which included the relatively large size contributing to mass effect symptom in the form of lumbar pain and kidney displacement, relatively young and obese patient without endocrine-like functions, and successful laparoscopic excision.

## Conclusions

Adrenal myelolipoma could be symptomatic by its size and organ displacement. However, it is usually a non-functioning tumor. Computed tomography is an excellent imaging tool for description and diagnosis of adrenal myelolipoma due to its characteristic high fat contents. In spite of the technical adjustments that may be indicated for some confounding difficulties, laparoscopic adrenalectomy for myelolipoma is a progressively emerging preferable approach. It may provide better outcomes in regards to the patient's high body mass index, hospital stay, and needs to analgesia.

## Authors' contributions

Rabea Ahmed Gadelkareem, contributed in surgery, developed manuscript idea, shared in writing, submission and approval of the manuscript; Mahmoud Magdy Khalil, contributed in data collection, surgery, and approval of the manuscript; Nasreldin Mohammed, contributed in surgery, revised and approved the manuscript; Rania Makboul, and Fatma Ahmed Badary are the pathologists who studied the microscopic finding and formulated pathological description in manuscript with final revision.

## Consent from the patient

Patient written consent was taken for treatment and surgery including his counseling about the policy of the institute as an academic research and teaching university hospital that allow publishing scientific data without identifying the patient identity or violating his confidentiality.

## Conflicts of interest

Authors have no conflicts of interest to disclose.

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