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Laparoscopy

Case report

Laparoscopic excision of a giant adrenal myelolipoma and review of the literature

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Abstract

Introduction: Adrenal myelolipoma is a rare benign tumor. It is usually asymptomatic with variable sizes, where the small lesions are usually managed conservatively and the large and symptomatic ones indicate open or laparoscopic adrenalectomy.

Observation: A 45-year-old obese male patient presented with an accidentally-discovered right adrenal mass during abdominal sonographic examination. The mass was clinically-palpable in the right lumbar region. Abdominal computed tomography described a well-circumscribed lesion displacing the right kidney downwards with compression and displacement of the inferior vena cava. It was heterogeneous with 16 cm × 14 cm × 8 cm dimensions and low attenuation appearance. Adrenal myelolipoma was suspected and the patient was counseled for the laparoscopic approach with high possibilities of conversion to open surgery. Laparoscopic excision was done by expert surgeons with demanding dissection from the surroundings, especially the liver and inferior vena cava, but, the mass was successfully removed. The postoperative course was short and uneventful. Histopathological examination confirmed the diagnosis of adrenal myelolipoma.

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Conclusions: Laparoscopic excision of giant adrenal myelolipoma is a challenging procedure, but it seems to be a feasible promising approach. Expert surgeons are recommended when operating large tumors, especially, in the obese patients.

Introduction

Adrenal myelolipoma is a rare tumor with a progressively increasing reporting rate. Its incidence progressed from 0.08–0.4% to 10–15% through the last decade. Its pathological composition comprises adipose and myeloid tissues [1]. Although it may reach huge sizes, adrenal myelolipoma is usually a small-sized asymptomatic lesion [2]. Treatment approach usually considers the lesion size, where masses of <4 cm are recommended for conservation, while the larger ones are treated by surgical interventions [1]. Owing to the worldwide progressively growing laparoscopic skills, many giant adrenal myelolipomas have been excised laparoscopically [3,4]. Our aim from the following case presentation is the verification of the feasibility of laparoscopic approach for the giant adrenal myelolipomas in obese patients.

Case report

A 45-year-old obese male patient presented to us with an accidentally-discovered huge right adrenal mass. He consulted many urological centers for treatment in different countries before the presentation to our center. Physical examination revealed a body mass index of 34.64 kg/m^2. There was a non-tender palpable right-sided abdominal mass. Otherwise, no clinical findings were detected.

Abdominal ultrasound described a right adrenal hyperechoeic lesion. Computed tomography described a large right adrenal mass markedly-displacing and rotating the right kidney with 16 cm × 14 cm × 8 cm dimensions and low attenuation heterogeneously hypodense appearance. The mass was well-defined with a clear demarcation from the compressed surroundings. Also, the inferior vena cava was displaced and stretched (Fig. 1A and B).

Laboratory work up of the adrenal tumor markers; metanephrines, serum cortisol, Vanillylmandelic Acid, and other routine and surgical fitness tests were unremarkable. The patient was counseled for the treatment options and associated risks and complications with a specific stress on the laparoscopic approach and possibilities of conversion to open surgery.

The patient had transperitoneal laparoscopic adrenalectomy. He was positioned in the left flank position with 45 tilt. Five laparoscopic ports were designated; the main port was 10-mm and placed as just supra-umbilical. A second 10-mm port created in the midline high in the epigastrium. Other two 10-mm ports were created in the mid-clavicular and lateral axillary lines two inches below the costal margin. Also, a 5-mm port was created in the mid-axillary line at a lower level than the previous ports. After pneumoperitoneum creation, instrumental adjustments, mobilization of the colon and retraction of the liver, dissection of the mass was carried out from the inferior vena cava with ligation of the right adrenal vein. Significant technical efforts were indicated for dissection of the mass extensions around the cava and the sub-hepatic plain (Fig. 2A–D). However, the operative course progressed without complications through a total time of about 3 h and 45 min. Blood loss was 180 ml with no blood transfusion.

Histopathological examination revealed benign mature adipose tissues and myeloid elements which confirmed the diagnosis of adrenal myelolipoma (Fig. 3A and B).

Discussion

Adrenal myelolipoma is a benign tumor composed of adipose and myeloid elements [5,6]. It has been commonly reported that adrenal myelolipoma has small sizes less than 4 cm [1]. However, with increased reporting rate, the sizes of the reported cases have been remarkably increased [4,6] (Supplementary Table 1). A recently published review article studied 440 histologically-verified clinical adrenal myelolipomas that were reported between 1957 and 2017 with an average size of 10.4 cm [7]. Adrenal myelolipoma is commonly a unilateral tumor with predominance of the right side [5]. It could be associated with other organs' tumors [8] (Supplementary Table 1). Rao et al. [9] differentiated adrenal myelolipomas into 4 distinct clinico-pathological patterns; isolated adrenal myelolipomas, adrenal myelolipomas with acute hemorrhage, extraadrenal myelolipomas, and myelolipomas with other adrenal diseases. Giant adrenal myelolipomas may follow this classification. Accordingly, the current case belonged to the first pattern which is the simplest one. They are prone to complications, especially the spontaneous rupture and life-threatening hemorrhage [1,7] representing the second pattern in the above mentioned classification.

Extraadrenal manifestations of myelolipoma result from two different issues; the first issue is the extraadrenal origin of myelolipoma which is an extremely rare entity with multiple predilection sites principally including thorax and retroperitoneum. The second issue is the very rare states in which adrenal myelolipoma develops secretory activities leading to hypertension or manifestations of hypercortisolism [1,7,10]. This pattern may result from an isolated functioning lesion or due to another co-existing adrenal lesion to be up graded to the fourth pattern.

Adrenal myelolipoma is commonly reported as a hormonally-inactive tumor. However, there are many reported associations with functioning adrenal disorders such as congenital adrenal hyperplasia and Cushing's and Conn's syndromes. The commonest postu-

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