Case Report
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Wunderlich Syndrome, Tuberous Sclerosis-Related Giant Renal Angiomyolipoma Rupture: Case Report

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Abstract

Angiomyolipoma (AML) is a mesenchymal tumor of the kidney that is composed of morphologically abnormal smooth muscle cells, blood vessels, and adipose-like foci. Renal AML is usually clinically asymptomatic and detected incidentally during imaging. Rarely, renal AML can cause life-threatening spontaneous massive retroperitoneal hemorrhage, known as Wunderlich syndrome. A 39-year-old man with tuberous sclerosis was admitted to the emergency room with left flank pain, hematuria, and nausea. On physical examination, there was a hard sensitive mass extending from the upper left half of the abdomen to the midline. Left renal AML and extensive retroperitoneal hematoma measuring about 360x220x195 mm were detected on abdominal computed tomography. The patient exhibited signs of hypovolemic shock and emergency total nephrectomy was performed. He was discharged from the intensive care unit on postoperative day 1 and from the hospital on day 5.

Keywords: Tuberous sclerosis, angiomyolipoma, Wunderlich syndrome

Introduction

Renal angiomyolipoma (AML) is a mesenchymal tumor of the kidney that is composed of morphologically abnormal blood vessels, smooth muscle cells, and adipose-like foci (1). Renal AML is usually clinically asymptomatic and may be detected incidentally during imaging. AMLs may become symptomatic as they increase in size. Rarely, renal AML can cause spontaneous massive hemorrhage in the renal subcapsular and/or perirenal area, which is a potentially life-threatening condition also known as Wunderlich syndrome (2).

Here we present a rare case of Tuberous sclerosis syndrome with hypovolemic shock (Wunderlich syndrome) after left renal AML rupture.

Case Presentation

A 39-year-old male patient was evaluated in the emergency department for left flank pain, hematuria, and nausea. From his medical history it was learned that he had tuberous sclerosis and was under regular follow-up due to bilateral renal AMLs. The patient also had mental retardation and was receiving antiepileptic therapy due to epilepsy. He had no history of anticoagulant use. On physical examination, a painful hard mass extending from the upper left region of the abdomen to the umbilical region was palpated. Numerous nodular skin lesions (adenoma sebaceum) were apparent between the nasal wings and the cheek. His arterial blood pressure was 70/40 mmHg, pulse was tachycardic (125 beats/min), and body temperature was 36.2 °C. In complete blood count, hemoglobin level was

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6.1 g/dL and hematocrit was 17.7%; serum biochemistry and coagulation tests were normal. Emergency full abdomen computed tomography (CT) with radiopaque contrast was performed. The CT scan revealed solid masses consistent with renal AML measuring 230x164x109 mm on the right and 360x220x195 mm on the left, and a large hematoma in the left retroperitoneal space (Figure 1). The patient underwent emergency laparotomy. An area of rupture extending to the collecting system of the anterior upper pole and extensive perirenal hematoma were detected. Left radical nephrectomy was performed. Two units of fresh frozen plasma and four units of erythrocyte suspension were transfused perioperatively. Postoperatively, the patient was intubated and admitted to the intensive care unit. He was extubated and transferred to an inpatient unit on postoperative day 1 and discharged on postoperative day 5.

On macroscopic examination, the tumor appeared to be an encapsulated mass measuring 34x21x9 cm in size and weighing approximately 3100 g Cross-sectional appearance was solid and yellow-gray in color with hemorrhages in some areas (Figure 2). Pathological examination of sections stained with hematoxylin and eosin revealed tumor tissue separated from the normal renal parenchyma by a smooth border and composed of vascular structures, myoid spindle cells, and mature fat tissue with no cellular atypia or mitosis. Immunohistochemical staining was positive for smooth muscle actin, vimentin, and HMB-45, and negative for CD68 and CD117. CD31 staining was observed in the vascular endothelial cells. The Ki-67 index was 0-1% in tumor cells, and the findings were considered consistent with renal AML.

The data used in this report was obtained with the consent of the patient's relatives.

Discussion

Tuberous sclerosis was described in 1862 by Von Recklinghausen after detecting sclerotic foci and cardiac tumors in autopsies (3). The term tuberous sclerosis complex (TSC) is now preferred due to the widespread systemic involvement of the disease. TSC is a rare genetic disease that manifests with epilepsy, mental retardation, and facial angioma (Vogt's triad) (4).

TSC can involve the brain, kidneys, heart, skin, eyes, bones, and lungs. Neurologic involvement is the most common, followed by renal involvement, which is present in 60-75% of cases (5). AMLs occur in 70-80% of tuberous sclerosis patients with renal involvement, renal cysts in 20%, and renal cancer is also seen in rare cases (6). There are two different types of renal AML: the first type occurs concomitantly with different diseases such as tuberous sclerosis, von Hippel Lindau, and von Recklinghausen neurofibromatosis, while the second type is isolated. The first type (20%) of renal AML is generally bilateral, multiple, and symptomatic and affects both sexes equally. The second, isolated type (80%) are single asymptomatic lesions with a female/male ratio of 4:1 and usually occur in women 50-60 years of age. Renal AMLs may be detected in 40-80% of patients with tuberous sclerosis (1).

AMLs are usually asymptomatic and often detected incidentally by radiological imaging (2). As the AML increases in size,

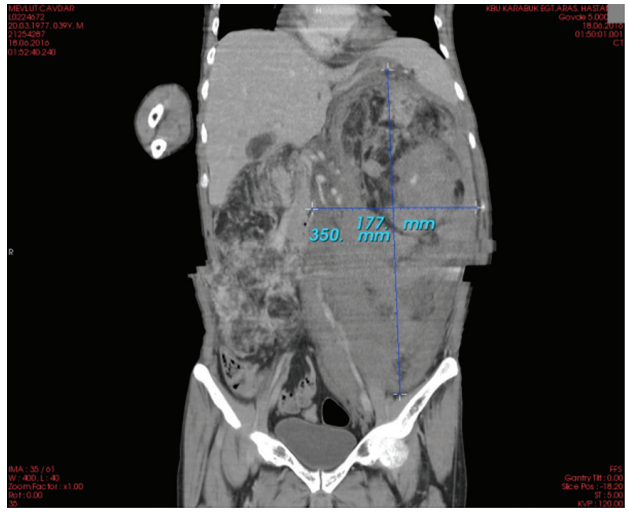

Figure 1. Computed tomography image of ruptured angiomyolipoma

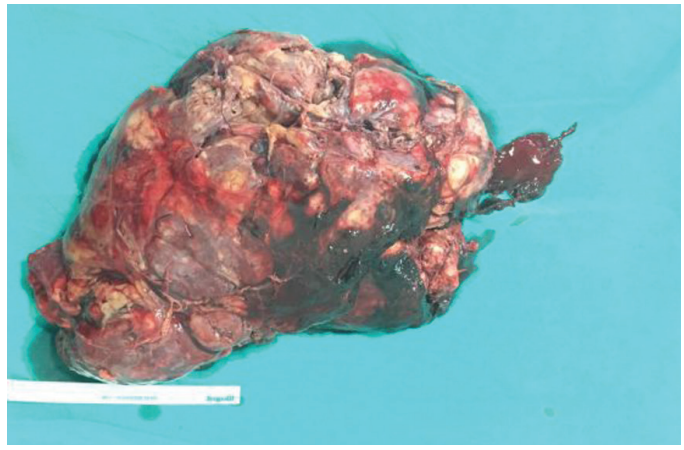

Figure 2. Macroscopic view of nephrectomy specimen

patients may present to the clinic with flank pain, palpable abdominal mass, or hematuria. One of the most dangerous clinical manifestations is spontaneous hemorrhage into the subcapsular and/or perirenal area, characterized by the classic triad of acute abdominal pain, palpable abdominal mass, and hypovolemic shock. This condition is called Wunderlich syndrome (2). A correlation has been observed between tumor size and hemorrhage risk. Oesterling et al. (7) reported that 82% of patients with AMLs over 4 cm in size were symptomatic, 9% of whom were in hemorrhagic shock at the time of diagnosis, whereas the symptomatic rate among patients with tumors smaller than 4 cm was 23%. Çalışkan et al. (8) determined that the main factors affecting the growth and symptomatic development of AMLs were tumor size, the presence of multiple tumors, and having tuberous sclerosis. In another study, Steiner et al. (9) also determined that patients with tuberous sclerosis require surgical intervention more often because they often have bilateral masses, they are younger, and their tumors are larger. Therefore, they emphasized the high risk of requiring surgery or developing symptoms in the presence of AML larger than 4 cm or TSC (9).

To the best of our knowledge, the largest unilateral AML to date, reported by Taneja and Singh (10) was 39x29x9 cm in size and weighed 7500 g Kalsi et al. (11) reported a case of TSC-associated bilateral renal AML with 30x21x13 cm and 30x18x10 cm tumors and a total tumor burden of 7843 g. Mistry et al. (12) reported a total tumor burden of 8305 cc in a patient with bilateral AMLs 29x27.5x15.5 cm and 30x19x13 cm in size, the highest tumor burden reported in this literature. In our case, we detected as a mass weighing approximately 3100 g and measuring 34x21x9 cm in size.

Monitoring is the first choice for asymptomatic AMLs smaller than 4 cm. Guidelines recommend imaging for renal morbidity every 1-3 years in patients with tuberous sclerosis (13). Treatment options should be evaluated based on tumor size, presence of TSC, and number of tumors. Selective arterial embolization, partial nephrectomy, and total nephrectomy are other treatment alternatives (14). Selective arterial embolization may be recommended for selected patients with solitary masses or hemorrhagic AML. In patients with tuberous sclerosis, pharmacologic approaches are currently recommended as first-line treatment options for AMLs larger than 3 cm and especially those exhibiting growth. There have been reports of significant response in tumor size with the mammalian target of rapamycin inhibitors (15).

A ruptured AML causing retroperitoneal hemorrhage can lead to life-threatening hypovolemic shock. Large renal AMLs should be monitored closely and treated electively. Partial or total nephrectomy may be life-saving in patients who develop Wunderlich syndrome.

Ethics

Informed Consent: It was taken.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: Ö.B., Concept: Ö.B., A.A., Design: Ö.B., A.A., Data Collection or Processing: S.B., Analysis or Interpretation: A.A., S.Ö., M.M.S., Literature Search: A.A., H.U.Ö., Writing: A.A.

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