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Case Report

Renal Artery Aneurysm – A Case Report From Kp

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Abstract

Renal artery aneurysm (RAA) is a rare lesion and occurs in less than 1% of the population. There are multiple available treatment options which depend on the type of aneurysm and the timely diagnoses of the condition. Understanding these options is important; endovascular techniques, renal auto-transplantation, and nephrectomy may be indicated. A case of RAA in the left renal artery was surgically treated with radical nephrectomy because of the nature of the presentation which was an emergency and was managed swiftly to save the patient's life.

Introduction

Renal artery aneurysm (RAA) is a dilated segment of the renal artery that exceeds the diameter of a normal renal artery by two times or more [1] It is a rare vascular complication with an incidence rate of 0.1% according to a few studies [2]. Indicators of RAA that require intervention include a lesion > 2.0 cm, hematuria, lesion in females of child-bearing age, thromboembolism, hypertension due to renal artery stenosis, dissection, and rupture [3–5] Renal artery aneurysms may be treated conservatively or surgically. Intervention-based management options that could be undertaken would be radical removal of the kidney, vascular bypass, embolization, auto renal transplantation, or stenting [6, 7]. In the present study, we report a case of RAA in the left renal artery which was surgically treated with radical nephrectomy because of the nature of the presentation which was an emergency and was managed swiftly to save the patient's life.

Case Presentation

A 50-year-old woman presented to the outpatient department with complaints of abdominal generalized pain which was more profound in the region of the left flank, and she had obvious abdominal distention and has some complaints of hematuria in the past couple of days which was getting worse. She also complained of lethargy, fatigue, and weakness for the past week. She had no known co-morbidities and her BMI was around 30. On examination, the abdomen was uniformly distended but was non-tender on deep palpation, she had no obvious organomegaly. Her initial laboratory workup included: a basic metabolic panel, complete blood profile, and urinalysis. The patient's Hb level was at a critical level of 3.7g/dl (normal 12.0 - 15.5 g/dL), creatinine was 1.17mg/dL (normal 0.6-1.2 mg/dL) and urea was 88mg/dL (normal <20). Her vitals at the time were deranged with her blood pressure of 80/40mmHg and tachycardia of 118bpm but she was maintaining her oxygen saturation levels on room air. Her urinalysis was positive for red blood cells, but she had no pus cells to suggest a urinary tract infection. Immediately she was administered 4 units of packed red cells and with a repeat Hb 8g/dL. The patient was consulted by the surgical unit team for evaluation of abdominal distention and hematuria. An urgent CT scan of the abdomen with contrast was advised to find the cause of abdominal distension and to see if there was any other underlying pathology to explain the symptoms, the top differential at the time was renal cell carcinoma. The first CT Abdomen could not yield a definitive diagnosis and the patient was given supportive management, for the following day, Another CT scan abdomen (figure 1.0 – 1.4) was done two days later which revealed a large aneurysm arising from the proximal segment of left renal artery measuring 3x2cm. It was 9.5 mm away from the aorta and 2.3 cm away from the left renal hilum. The sign that gave it away was the active extravasation of contrast was observed with a resultant large hematoma formation in the left perinephric region measuring 18x9x10cm.

The patient after her CT scan was hypotensive again with systolic pressures of 90mmHg – 80mmHg and was maintaining saturations on room air with tachycardia, her fresh Hb had dropped to 6g/dL (normal 12.0 - 15.5 g/dL) after which she was immediately shifted to the operation theatre and another 4 units of RCC, FFP, and platelets was administered. The patient underwent a radical left nephrectomy via a midline incision because of the emergency protocol and there was no time to manage a vascular surgeon at the time to graft the kidney and refashion the vascular anastomosis. As it was expected to be, a renal aneurysm with a formation of hematoma was occurring. Around 5 liters of blood was drained from the abdominal cavity and (figure 1.5 – 1.6) left renal vessels were clamped and a nephrectomy was performed. Hemostasis was secured and the patient was closed after placing a drain.

Post-operative care continued in the intensive care unit (ICU) and the patient was on ventilator support post-procedure for the recovery period. The transition and extubation went smoothly and without any complications. There was an integral rise in her creatinine level which was seen after the surgery creatinine level = 2.72 mg/dl which dropped to 1.10 mg/dl (normal 0.6-1.2 mg/dL) after 6 days, the surgical drain was removed on postoperative day 6 and was discharged with follow up in 2 weeks. On her follow up her creatinine level came down to 0.9 mg/dl after two weeks. During hospitalization, no signs of infection or further bleeding were noted. A serial renal

function test was performed as an outpatient on regular follow-ups, and they were in normal ranges, she was given a consultation with the nephrology team to further manage her lifelong care.

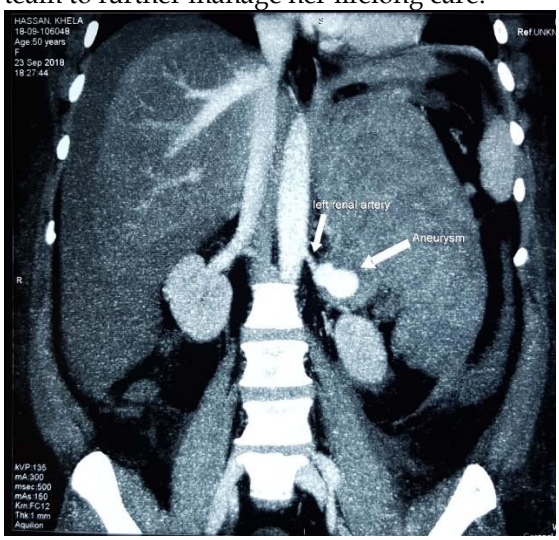

Figure-1.0 A coronal view of the CT – scan abdomen shows the left renal artery with the extravasation of the contrast and the presence of the aneurysm.

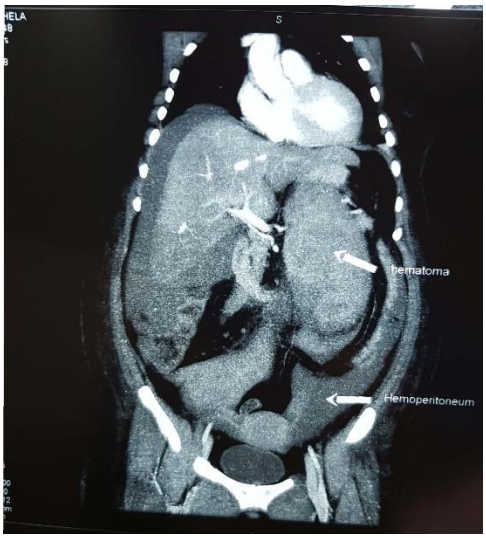

Figure-1.1 A coronal view of the CT – scan abdomen shows the formation of the hematoma and also hemoperitoneum and collection of the blood in the abdominal cavity.

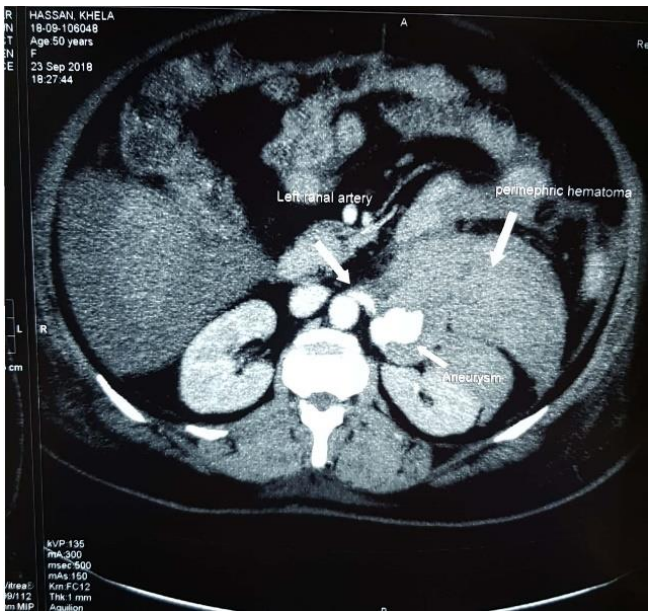

Figure-1.2 A transverse view of the CT – Scan of the Abdomen shows the formation of the perinephric hematoma in close proximity of the renal artery.

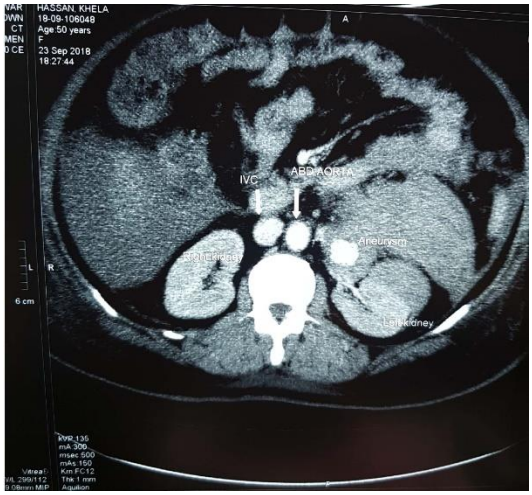

Figure-1.3 A transverse view of the CT – Scan abdomen shows the presence of the abdominal aorta and the inferior vena cava and the left kidney and the proximity of the aneurysm.

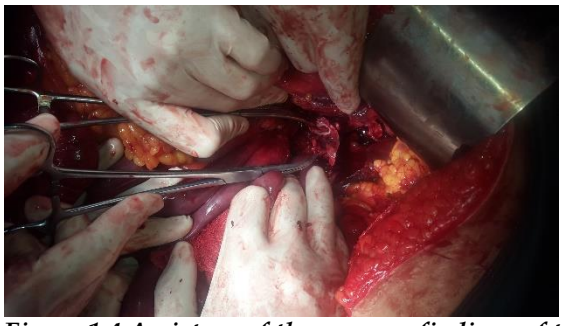

Figure-1.4 A picture of the per – op findings of the ruptured aneurysm and the ends of the intimal layers of the renal vessel.

Figure-1.5 A picture of the per – op findings of the ruptured aneurysm and the ends of the intimal layers of the renal vessel.

Discussion

In 1770, a renal artery aneurysm was first discovered during an autopsy of the large, ruptured aneurysm [8]; since then, numerous case reports and series have discussed its epidemiology and pathophysiology. RAA is defined as the dilation of the renal artery twice its normal size. Symptoms of RAA include flank pain, hematuria, and infraction which could be due to embolization from an aneurysm or could be due uncontrolled hypertension resultant in renal artery stenosis [2]. Rundback et al; angiographic system-based classification divides renal aneurysms into three types; type I are saccular aneurysms that either arise from the main renal artery or from a proximal large segment artery, type II is fusiform and also occur at the main real artery or the proximal segments and type III are intraparenchymal aneurysms affecting segmental or accessory arteries [7].

Indications for interventional treatment in a patient with RAA are rupture, acute dissection, rapid expansion, women who are pregnant or contemplating pregnancy, symptomatic RAA and lesion > 2cm [3–5]. Tham et al concluded that surgery in RAA cannot be justified unless there is a risk of rupture, however intervention is only justifiable if its symptomatic [9]. Although in one study surgical repair was recommended of RAAs with more than 1.5cm diameter [3]. In another study, patients with an aneurysm smaller than 1.5cm were recommended for regular follow-up without intervention [10]. In our patient, the RAA measured 3cm and was already ruptured when it was diagnosed, so surgical treatment was necessary to prevent any further complications.

Treatment of RAA varies and depends on the type of aneurysm according to Runback's classification. In type I the options are: coil embolization and stent grafts [6]. These endovascular interventions are minimally invasive procedures and can be used to treat extra-parenchymal or intrarenal aneurysms. Surgical treatment with segmental excision and arterial reconstruction using an autologous vein is the best treatment option for type II aneurysms [1]. Since type III aneurysms are intraparenchymal, the best option is coiling embolization [1, 6]. A nephrectomy can be performed If the above options fail or are not feasible as they were in our case. In our case, the patient had a ruptured aneurysm, so the only feasible treatment option was a radical nephrectomy. After treatment, the patient should be followed initially after one month and then 6 months, and then annually.

The aneurysm reported, in this case, study was a ruptured type I aneurysm. Endovascular treatment options are available for type I lesions, as mentioned above. However, in this case, due to a rupture of the aneurysm, nephrectomy was the feasible surgical solution. On follow-up at one month, the patient had stable renal function and an improved blood profile.

In this case report we report a case of ruptured renal artery aneurysm and discuss the multiple possible treatment pathways depending upon your care center's capability. In an age where rapid progress has been seen in endovascular treatment options, it is important to know all the possible treatment options after thorough evaluation. In this case, nephrectomy was the appropriate treatment.

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