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ANGIOMYOLIPOMA – VARIED PRESENTATIONS – A CASE SERIES

Urology

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ABSTRACT

Renal angiomyolipoma is a benign mesenchymal tumour composed of fat cells, smooth muscle cells, and thick-walled blood vessels. These tumors can occur sporadically or as part of genetic syndromes: most commonly tuberous sclerosis complex. Here we present three cases of Renal angiomyolipoma(AML) in different scenarios - presenting with clinical features like flank pain, abdominal mass or perirenal haematoma with hypovolemic shock. All three cases were evaluated by contrast enhanced CT & diagnosed as renal angiomyolipoma. Nephron sparing surgery - Partial nephrectomy was done in case 1. Case 2 underwent angiography with non- selective angioembolisation preoperatively followed by simple nephrectomy. Case 3, after initial stabilization and evaluation found to be a case of Wunderlich syndrome and simple nephrectomy done. Post intervention period was uneventful for all 3 cases. In the 6-month follow-up, all three patients were doing well with normal renal function and no recurrence in case of partial nephrectomy. Embolisation is the emergency treatment of choice for bleeding angiomyolipoma. Whenever possible, a nephron sparing approach by either transarterial embolisation or partial nephrectomy is to be considered. In cases of angiomyolipoma of both kidneys or in a solitary functioning kidney, renal preservation is mandatory in order to avoid need for renal replacement therapy. Also, recently approved drug Everolimus may be considered for patients not suitable for surgery particularly in tumour seen with tuberous sclerosis.

KEYWORDS

Angiomyolipoma , Embolization , Tuberous sclerosis

CASE REPORT- 1

A 53-year-old female presented to our outpatient department with right flank pain since one month with vomiting. General physical examination revealed a moderately built patient with stable vital parameters. Abdominal examination was normal with no palpable mass or organomegaly. Complete blood counts and RFT were normal. Ultrasound abdomen revealed a mass of mixed echogenicity involving upper pole of right kidney. Contrast enhanced computed tomography (CECT) revealed well defined heterogenous mass of size 8 x 5.3 x 7.7 cm containing fat density (11-18 Hounsfield unit) seen in upper pole with a cortical breech (Fig. 1). Findings suggestive of Angiomyolipoma of Right kidney.

Patient underwent Right partial nephrectomy. Intraoperatively, 8 x 6 cm sized fatty mass encasing upper pole of right kidney is seen while rest of the parenchyma appeared normal (Fig. 1a). Mass is excised & hemostasis achieved. Resected specimen was sent for histopathological examination which showed sheets of mature fat cells interspersed with blood vessels & smooth muscle bundles and margins are free of tumour. Final Impression is of right renal AML. On 6-month follow-up, patient was doing well without any recurrence in remaining part of the kidney.

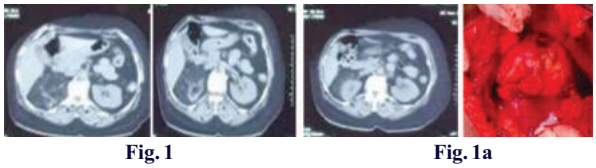

Fig. 1 **Fig. 1a**

CASE REPORT-2

A 42-year-old female presented to our outpatient department with dull aching right flank pain and lump in right side of the abdomen. Per abdominal examination revealed a 16X15cm mass in right hypochondrium and lumbar region. Complete blood counts and RFT were normal. CECT revealed large well defined exophytic fat density mass lesion of size 15.7x14x13.7 cm arising from lower pole of right kidney (Fig. 2).

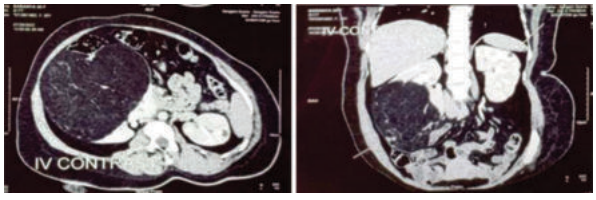

Fig. 2

Lesion is causing mass effect on adjacent structures with displacement of bowel loops. Left kidney also contains a small non enhancing lesion in upper pole cortex of size 10x7 mm with low density areas suggestive of small AML.

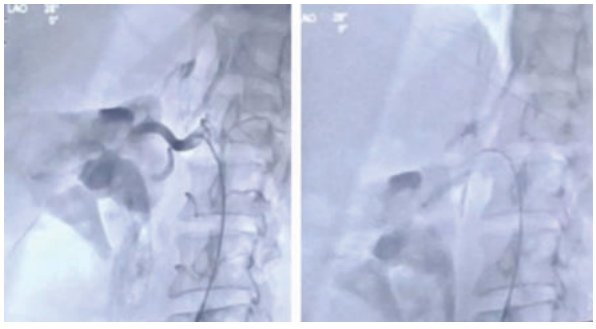

Fig. 3

Pre operative non selective renal artery embolisation was done a day prior to surgery to prevent blood loss (Fig. 3).

Introperatively, a mass of size 19x16x13 cm, lobulated, hypervascular and occupying almost whole of right kidney was found with single renal vein and single renal artery (Fig. 4).

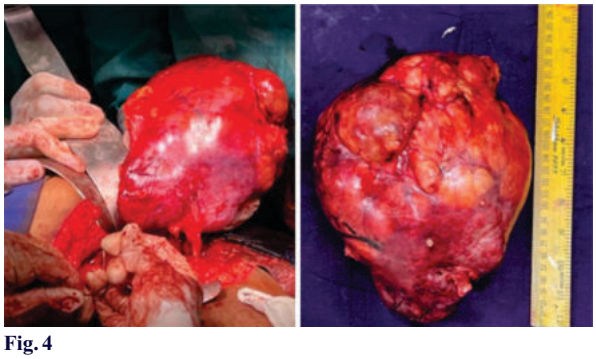

Fig. 4

Right simple nephrectomy was done. Resected specimen was sent for histopathological examination which shows a well circumscribed lesion with features consistent with angiomyolipoma and renal capsule, renal pelvis and ureter are tumour free. Monthly follow-up

was done for 6 months with USG KUB, showed no increase in size of the lesion in left kidney and patient doing well.

CASE REPORT-3

A 35-year-old man presented with agonizing left flank pain, vomiting and in a state of shock with severe pallor. Patient's initial vitals were pulse rate 122/minute, blood pressure of 80/50 mmHg, respiratory rate of 28/minute and temperature was normal. Immediate resuscitation was started with intravenous fluid, blood and blood products. History of epilepsy present and on medications for 7 years. On examination, patient was moderately built with severe pallor. On external appearance skin lesions over face (adenoma sebaceum) were visible. Per abdominal examination revealed diffusely tender and distended abdomen with guarding and a mass of approximately 12 x 10 cm occupying the left flank, epigastric and umbilical area. Per rectal examination was unremarkable. Blood investigations revealed a haemoglobin of 4.8 g/dL, a total leukocyte count of 17500/mm^3, and a platelet count of 240 x 10^3/mm, creatinine of 0.9 mg/dL and a blood urea nitrogen (BUN) of 20 mg/dL. Clinical diagnosis of tuberous sclerosis with Wunderlich syndrome was made. Following resuscitation and stabilization, contrast enhanced CT KUB was done, which revealed a large mixed density mass lesion of size 12 X 10.5 X 9 cm containing fat density (11-18 Hounsfield unit) with hyper vascularity in anterolateral aspect of left kidney and pseudo aneurysm of 3.0 x 1.8 cm seen within the lesion (Fig. 5). Large perinephric hematoma of 3-4 cm thickness seen around lesion. Right kidney was normal in size with no pelvicalyceal system dilatation. Complex cystic mass of size 4 x 3 cm with fat and solid component seen in the right kidney also.

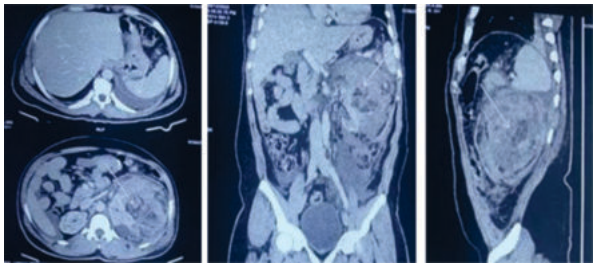

Fig. 5

MRI brain showed areas of sub ependymal giant cell astrocytoma. As the patient's vitals were fluctuating even after initial resuscitation, emergency exploration undertaken. Left Nephrectomy was done (Fig. 6).

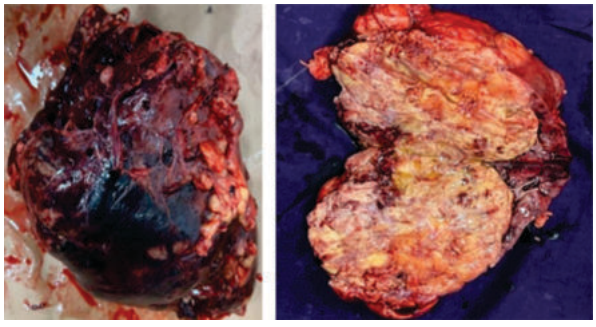

Fig. 6

Resected specimen was sent for histopathological examination which revealed the tumour composed of variable amounts of three components; thick walled blood vessels, smooth muscle cells and mature fat cells with tumour free margin. Monthly follow-up was done for 6 months with USG KUB, showed no increase in size of the lesion in right kidney and patient doing well.

DISCUSSION

Angiomyolipoma is now considered among the family of perivascular epithelioid cell tumors (PECOMAs). Renal Angiomyolipoma is typically a solid "triphasic" tumor composed of three elements in varying amounts: dysmorphic blood vessels, smooth muscle components, and mature adipose tissue. Sporadic angiomyolipoma constitute about 80%, while 20% are associated with tuberous sclerosis complex (TSC)[1].

Sporadic tumours are unilateral and most commonly occur in middle-aged women with F: M ratio of 4:1. They are usually single, small and rarely progress. Tumours that are less than 4 cm in size are mostly asymptomatic and those that are bigger than 4 cm usually exhibit symptoms that includes fever, nausea, vomiting, pain, palpable mass, haematuria, hypertension, anaemia, and shock. Retroperitoneal haemorrhage (Wunderlich syndrome) is seen in up to 50% of cases with large tumours [1].

Inherited AML's are seen either in association with TSC (tuberous sclerosis complex) or rarely as a part of LAM (lymphangio-leiomyomatosis), or occasionally along with Von Hippel Lindau syndrome (VHL) and Neurofibromatosis type 1 (NF1). Inherited AML's occurs in much younger age group with equal preponderance in both genders. They are usually larger in size, multiple, bilateral & prone to rapid growth and become more aggressive. They are more likely to be fat-poor, which accounts for their earlier presentation [2]. They also manifest with neurological manifestation (mental retardation, seizures) and cutaneous symptoms (adenoma sebaceum) and renal failure as part of tuberous sclerosis complex.

Mutations in the hamartin gene (TSC1) or the tuberin gene (TSC2) accounts for AMLs in patients with tuberous sclerosis as well as sporadic type. Mammalian target of rapamycin (mTOR) activity is negatively regulated by the hamartin-tuberin complex of TSC1 genes (on chromosome 9q34) and TSC2 genes (on chromosome 16p13) so inactivating mutations of these proteins results in unregulated mTOR . This results in protein synthesis, cellular growth and angiogenesis, leading to tumour growth. Upregulation of mTOR is found in TSC AML and sporadic AML. Sirolimus (mTOR inhibitor) showed promising results by down grading these tumours [3,4,5]

Management of AML primarily requires proper evaluation and in particular, the risk of haemorrhage. The majority of renal AMLs are asymptomatic ; however, abdominal & flank pain and haematuria are typical clinical symptoms [6]. Inspite of their benign nature, spontaneous growth and bleeding can occur, especially in tumors larger than 4 cm. Active surveillance for small AML is recommended by the European Association of Urology. AML larger than 4 cm are more likely to require surgical intervention; however, this size cut-off point has lately been questioned. [6]

In our series, case 1, presented with right flank pain and upper pole mass of size 8 x 6 cm in right kidney, hence patient underwent a nephron sparing surgery – partial nephrectomy. In case 2, patient presented with right flank pain and very large tumor of size 15 x 14 x 13 cm for which pre op renal artery embolization followed by right simple nephrectomy done. In case 3, patient presented with agonizing pain in left flank, severe pallor with hypovolemic shock and tumour size of 12 x 10 x 9 cm with perirenal hematoma. Emergency exploration and simple nephrectomy was done.

Treatment approach could be – by parenchymal preservation: achieved by nephron sparing surgery or preferably by selective embolization of these tumours, especially in patients with tuberous sclerosis, multicentric AML, or those with compromised renal function. The other approach – partial nephrectomy, is usually warranted in patients with large bilateral lesions or lesion in solitary kidney, because it is always better to have some functioning nephron than making the patient anephric.

Selective trans arterial embolisation (TAE) is most effective therapeutic measure in most of the renal AMLs including cases of large asymptomatic tumours, in females of childbearing age especially in patients with sporadic AMLs [7,8]. Patients with TS and multiple AMLs pose a therapeutic challenge because of high recurrence rate (60%). Lifelong surveillance for recurrence after AML embolization is essential in patients with TS [9]. Though some patients will have post embolisation complications like post-embolisation syndrome and abscess formation needing secondary procedures like percutaneous drainage or nephrectomy.

Rapamycin (sirolimus) an mTOR inhibitor is a promising immunosuppressant for use in angiomyolipoma because of the role of mTOR activation in tumour development [8]. After 1 year of treatment with sirolimus it results in decrease in the size of angiomyolipomas and an improvement in lung function in adults with the tuberous sclerosis complex or sporadic lymphangioleiomyomatosis[8,10].

Most patients with acute or potentially life-threatening hemorrhage

requires simple nephrectomy, if it is explored; in such circumstances, selective embolisation can temporize and in many cases prove definitive. Partial or simple nephrectomy if planned should be done within few days of angioembolisation to avoid extensive adhesion. If surgical option is not present, then everolimus may be considered as alternative therapeutic options. [8,10]

CONCLUSION

The presentation of AML varies from flank pain or abdominal mass to the extreme of hypovolemic shock. Similarly, therapeutic options for symptomatic AML's can be nephron sparing approaches like embolization or partial nephrectomy to simple nephrectomy in cases of large AML. However, in patients with Tuberous Sclerosis, angiomyolipomas in both kidneys or in a solitary functioning kidney, renal preservation is to be considered to avoid the need for renal replacement therapy.

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