Annals of Clinical Case Reports

Case Report
Published: 24 Aug, 2020

The Identification of a Girl with Tuberous Sclerosis and an Unexpected Large Sized Renal Angiomyolipoma: A Case Report and Literature Review Study

Mitra Naseri[1], Farah Ashrafzadeh[2], Fatemeh Ghalibafan[3] and Paria Dehghanian[4]*

[1]Department of Pediatric Nephrology, Mashhad University of Medical Sciences, Iran

[2]Department of Pediatric Neurology, Mashhad University of Medical Sciences, Iran

[3]Department of Medicine, Mashhad University of Medical Sciences, Iran

[4]Department of Pathology, Mashhad University of Medical Sciences, Iran

Abstract

Background: The TSC1 mutated gene, hamartin, and the TSC2 gene, tuberin, cause tuberous sclerosis, the autosomal dominant tumor syndrome. The angiomyolipoma of the kidney is a benign tumor that often happens along with tuberous sclerosis. Large renal angiomyolipoma's associated with tuberous sclerosis are in danger of fatal hemorrhage. This study reported a case with an unexpected large size of renal angiomyolipoma's associated with tuberous sclerosis.

Case Presentation: We report a girl aged 5 years and 9 months old with tuberous sclerosis who referred to nephrology clinic due to abdominal pain. Physical examination revealed a large mass in the right flank. Kidney ultrasound reported a large mass with approximate size of 90 mm × 60 mm in the right kidney, and abdominal CT scan also showed a non-hemogenic solid mass in the right kidney with size of 91 mm × 68 mm × 67 mm, was highly suspected for Wilms' tumor. Since the large size of lesion and subsequent suspension for malignant tumor, partial nephrectomy was performed and through kidney biopsy an unexpected angiomyolipoma was diagnosed.

Conclusion: Considering extended studies in various populations with tuberous sclerosis and renal angiomyolipoma, this case is challenging and intriguing since she was the youngest one among patients with necessity of nephrectomy due to the large size of lesion and radiologic findings suggestive of Wilms' tumor.

Keywords: Tuberous sclerosis; Renal angiomyolipoma; Children; Nephrectomy

OPEN ACCESS

Correspondence:
Fatemeh Ghalibafan, Department of Medicine, Mashhad University of Medical Sciences, Mashhad, No. 12, Mirdamad Blvd, Birjand, Iran, Tel: +98-56-32406106; +98-9376142744; E-mail: f.ghalibafan@yahoo.com

Received Date: *27 Jul 2020*
Accepted Date: *21 Aug 2020*
Published Date: *24 Aug 2020*

Citation:
Naseri M, Ashrafzadeh F, Ghalibafan F, Dehghanian P. The Identification of a Girl with Tuberous Sclerosis and an Unexpected Large Sized Renal Angiomyolipoma: A Case Report and Literature Review Study. Ann Clin Case Rep. 2020; 5: 1876.

ISSN: 2474-1655

Introduction

Tuberous Sclerosis (TS) is an uncommon neurocutaneous and genetic disease, arises from inactivating mutations of either TSC1 (chromosome locus 9q34.3) or TSC2 (16p13.3) genes which encode hamartin and tuberin, respectively. These proteins serve as tumor suppressors by forming complexes that controls proliferation of cells [1]. Benign tumors in patients with TS are identified in various organs including retina, lungs, heart, brain, skin and kidney [1,2]. In affected infants, cardiac rhabdomyomas, hamartomas, epilepsy and skin lesions are the most common symptoms [2,3]. The most frequent manifestations in kidneys are unilateral or bilateral renal angiomyolipoma's, which occur in a majority of patients (34% to 80%) [4,5]. Renal angiomyolipoma's usually appear later in life, and can associate with fatal bleeding, and hypovolemic shock [2,4,6,7].

Although renal angiomyolipoma's usually consist of adipocytes, irregular vasculature, and smooth muscle cells, the proportions of each parts of tumor can differ in patients [8]. Renal angiomyolipoma's with a size more than 40 mm can result in vascular aneurysm and fatal hemorrhage. Vascularity of the lesion can rise with growth of the size [4,7]. Complications are usually treated with angiographic embolization or surgical removal such as radical nephrectomy [9]. This study reported a case with an unexpected large size of renal angiomyolipoma's (90 mm × 60 mm) associated with Tuberous sclerosis. It was so interesting that despite large size of tumor, there were no evidences of bleeding, and kidney ultrasound and abdominal CT scan findings were representative of Wilms' tumor.

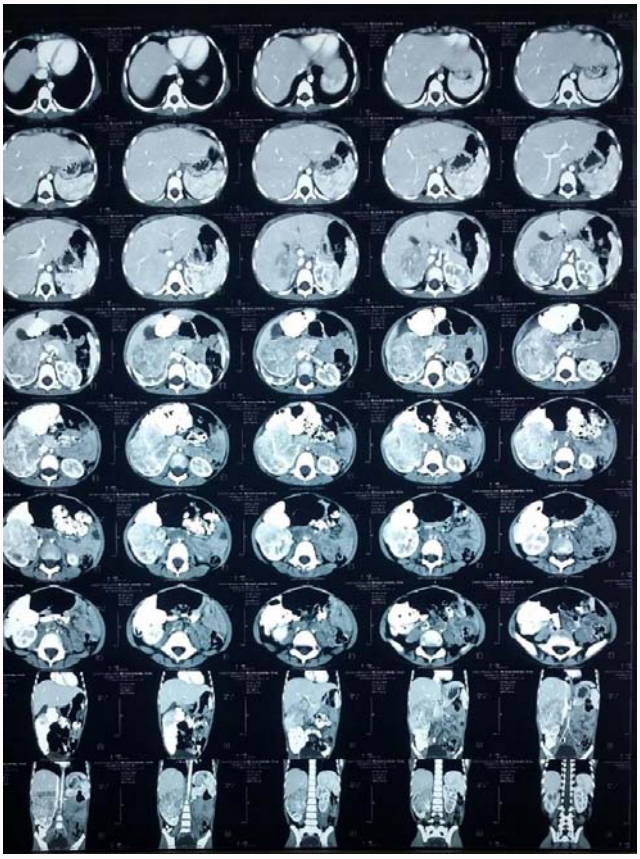


Figure 1: Abdominal CT scan with contrast media injection which shows a non-hemogenic solid mass in the right kidney with the size of 91 mm × 68 mm × 67 mm, highly suspected to Wilms' tumor. Additionally, various non-hemogenic lesions in middle line, spleen and the left kidney which are undifferentiated from normal parenchyma. No abdominal lymphadenopathy.

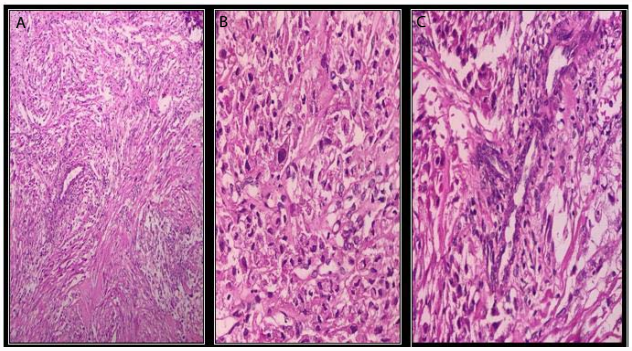
Case Presentation

The patient was an Iranian girl aged 5 years and 9 months old and referred to nephrology clinic due to abdominal pain and a huge right flank mass. At the age of 9 months, following recurrent seizures accompanied by skin lesions the diagnosis of TS was made for this patient. Her weight was 15 kg (Z score: -2) and systolic blood pressure at first visit was 100 mmHg with no detectable diastolic blood pressure. Pulse rates were normal and there were no evidences of internal hemorrhage.

Although she was old enough (age >5 years), she had fecal and urinary incontinence and because of intellectual disability she was unable to speak. Physical examination determined different Café au lait macules and angiofibroma's lesions on the face, limbs, trunk and borders of the fingers, and Shagreen patch in the region of lumbar vertebrates. She had a history of repetitive hand surgeries for removal of fingers lesions which restricted her movements. Physical examination of abdomen revealed a huge mobile mass in the right flank without tenderness.

Imaging test

Kidney ultrasound findings reported a large mass with a size of 90 mm × 60 mm in the right kidney, very closely resembled a Wilms' tumor. Abdominal CT scan with intravenous contrast injection defined a non-hemogenic solid mass in the right kidney with a size of 91 mm × 68 mm × 67 mm, highly suspected to Wilms' tumor (Figure 1). Thoracic CT scan also performed in multiple sections and their results were unremarkable. Partial nephrectomy was performed and histopathologic examination revealed Pleomorphic Angiomyolipoma as the final diagnosis and there were no histological evidences of Wilms' tumor (Figures 2A-2C).



Figures (2A-2C): Pleomorphic Angiomyolipoma composed of epithelioid cells with acidophilic or clear cytoplasm and some bizarre nuclei intermixed with blood vessels. (H&E staining low and high-power field). The tumor cells showed immunoreactivity for Desmin and HMB-45 that confirmed the diagnosis.

Discussion

Tuberous Sclerosis (TS) is an autosomal dominant disease, most commonly caused by TSC1 or TSC2 genes mutation and identified by benign hamartomas in about 34% to 80% of TS patients with renal angiomyolipoma [10]. It is a rare genetic multisystem disorder, presented by benign tumors which can develop in any organ system. It's prevalence in live-birth is 1 in 5,800 births and prevalence of 1 in 12,500 had been reported in total population [11]. Renal angiomyolipoma's are benign vascular, smooth muscle tumors and are typically asymptomatic but may induce flank or abdominal pain, hematuria, abdominal mass or distension, fever, nausea, vomiting, or progressive loss of kidney function. Death due to retroperitoneal hemorrhage (Wunderlich syndrome) have been reported in cases with renal angiomyolipoma's [12].

Growth of angiomyolipoma associated with TSC is faster than those associated with sporadic angiomyolipoma [13], Angiomyolipoma's with a diameter >3.5 cm have the significant risk for severe hemorrhage and selective embolization should be considered as first treatment [14]. Renal angiomyolipoma lesions are classified as small (<4 cm), medium (4 cm to 8 cm) or large (>8 cm) based on the single largest lesion in each kidney. The severity of complications is mostly related to the sizes of lesions. The mean size of 85 mm (35 mm to 200 mm) and 78 mm (45 mm to 180 mm) renal angiomyolipoma's (sporadic or associated with TSC) referred to selective embolization, have been reported in two studies [15,16] and the individual risk of bleeding appears moderate, even in TS patients (around 6%) [5].

It has been reported that tumors sized >6 cm are at higher risk of bleeding [17], while another study showed that tumors with size of <8 cm tend to be asymptomatic [18]. Similar to our case, a recent study reported asymptomatic giant renal angiomyolipoma's (290 mm × 215 mm × 120 mm) in a patient [19].

In a recently extended study among patients with TS, 1070 of 2065 enrolled cases (51.8%) had a history of renal angiomyolipoma. Among patients aged <18 years, 34.3% had angiomyolipoma with the

size of >3 cm. Totally 498 cases with renal angiomyolipoma (46.5%) needed to treatment, including 11/134 (8.2%) patients who were at age of 5 to 9 years (likely the age range of our case). Nephrectomy was a rare modality used for treatment in cases <18 years (5/498 cases; 1%), while in those aged >18 years, 57/572 patients (9.95%) underwent nephrectomy. The youngest age for nephrectomy was >9 years [20].

Conclusion

Our case is interesting since presents a girl with TS and large renal angiomyolipoma which mimicking the Wilms' tumor findings in the imaging studies (renal ultrasound and abdominal CT scan). Despite large size of tumor there was no sign of bleeding. Patient underwent nephrectomy because of the large sized lesion and suspicion to malignant tumor. Nephrectomy rarely needed in children with TS who were at age of <18 years (1%). Considering an extended study in a large population with TS and renal angiomyolipoma, our case had been the youngest one with indispensable nephrectomy.

Acknowledgment

The authors thank all the staff of Children's Medical Center at Tehran University of Medical Sciences for their kind assistance with this study.

References

1. DiMario FJ, Sahin M, Ebrahimi-Fakhari D. Tuberous sclerosis complex. Pediatr Clin North Am. 2015;62(3):633-48.
2. Curatolo P, Maria B. Tuberous sclerosis. Handbook of clinical neurology: Elsevier; 2013. p. 323-31.
3. Hussain N, Curran A, Pilling D, Malluci C, Ladusans E, Alfirevic Z, et al. Congenital subependymal giant cell astrocytoma diagnosed on fetal MRI. Arch Dis Child. 2006;91(6):520.
4. O'Callaghan FJ, Noakes MJ, Martyn CN, Osborne JP. An epidemiological study of renal pathology in tuberous sclerosis complex. BJU Int. 2004;94(6):853-7.
5. Rakowski S, Winterkorn E, Paul E, Steele D, Halpern EF, Thiele E. Renal manifestations of tuberous sclerosis complex: Incidence, prognosis, and predictive factors. Kidney Int. 2006;70(10):1777-82.
6. Franz D, Bissler J, McCormack F. Tuberous sclerosis complex: Neurological, renal and pulmonary manifestations. Neuropediatrics. 2010;41(05):199-208.
7. Budde K, Gaedeke J. Tuberous sclerosis complex–associated angiomyolipomas: Focus on mTOR Inhibition. Am J Kidney Dis. 2012;59(2):276-83.
8. Bissler JJ, Kingswood JC. Renal angiomyolipomata. Kidney Int. 2004;66(3):924-34.
9. Faddegon S, So A. Treatment of angiomyolipoma at a tertiary care centre: The decision between surgery and angioembolization. Can Urol Assoc J. 2011;5(6):138-41.
10. Rosset C, Netto CBO, Ashton-Prolla P. TSC1 and TSC2 gene mutations and their implications for treatment in Tuberous Sclerosis Complex: A review. Genet Mol Biol. 2017;40(1):69-79.
11. O'Callaghan FJ, Shiell AW, Osborne JP, Martyn CN. Prevalence of tuberous sclerosis estimated by capture-recapture analysis. Lancet. 1998;351(9114):1490.
12. Eijkemans MJ, van der Wal W, Reijnders LJ, Roes KC, van Doorn SBvW, Pelletier C, et al. Long-term follow-up assessing renal angiomyolipoma treatment patterns, morbidity, and mortality: An observational study in tuberous sclerosis complex patients in the Netherlands. Am J Kidney Dis. 2015;66(4):638-45.
13. Bhatt JR, Richard PO, Kim NS, Finelli A, Manickavachagam K, Legere L, et al. Natural history of renal Angiomyolipoma (AML): Most patients with large AMLs >4 cm can be offered active surveillance as an initial management strategy. Eur Urol. 2016;70(1):85-90.
14. Van Baal J, Smits N, Keeman J, Lindhout D, Verhoef S. The evolution of renal angiomyolipomas in patients with tuberous sclerosis. J Urol. 1994;152(1):35-8.
15. Dabbeche C, Chaker M, Chemali R, Perot V, El Hajj L, Ferriere J, et al. Role of embolization in renal angiomyolipomas. J de Radiologie. 2006;87(12-C1):1859-67.
16. Villalta JD, Sorensen MD, Durack JC, Kerlan RK, Stoller ML. Selective arterial embolization of angiomyolipomas: A comparison of smaller and larger embolic agents. J Urol. 2011;186(3):921-7.
17. Chronopoulos PN, Kaisidis GN, Vaiopoulos CK, Perits DM, Varvarousis MN, Malioris AV, et al. Spontaneous rupture of a giant renal angiomyolipoma-Wunderlich's syndrome: Report of a case. Int J Surg Case Rep. 2016;19:140-3.
18. Kuusk T, Biancari F, Lane B, Tobert C, Campbell S, Rimon U, et al. Treatment of renal angiomyolipoma: Pooled analysis of individual patient data. BMC Urology. 2015;15(1):123.
19. Mensink J, Locketz M, Lazarus J. Giant angiomyolipoma in a tuberous sclerosis patient and review of the literature. Af J Urol. 2018;24(3):175-9.
20. Kingswood JC, Belousova E, Benedik MP, Carter T, Cottin V, Curatolo P, et al. Renal angiomyolipoma in patients with tuberoussclerosis complex: Findings from the Tuberous sclerosis registry to increase disease awareness. Nephrol Dial Transplant. 2019;34(3):502-8.