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Case Report

Challenges in the Diagnosis and Management of Renal Bleeding from a Suspicious Renal Mass in a Patient with a Single Kidney: A Case Report

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Abstract

The incidental finding of a renal nodule has become increasingly common due to an improvement in the quality of imaging exams associated with a higher demand for revision consultations by the general population. Therefore, the differential diagnosis between benign and malignant diseases poses a challenge. Frequently, surgery is suggested as the only diagnostic and therapeutic option. Complex cases, such as the one reported below; require greater attention from the urologist regarding the renal lesion's characteristics and its natural history, especially regarding tumor behavior and the possibility of malignancy.

Keywords: Renal angiomyolipoma; Single kidney mass; Partial nephrectomy

Introduction

Renal angiomyolipoma is an uncommon tumor, but it is benign in most cases. The diagnosis can be made by Computed Tomography (CT) or Magnetic Resonance Imaging (MRI). The presence of fatty tissue is a striking characteristic, not a diagnostic dilemma for the radiologist in most cases, enabling a conservative approach with active surveillance [1]. Although rare and poorly reported in the literature, there are also cases of tumor malignancy. We present in this article a complicated case of angiomyolipoma and its possible transformation into malignant pathology and a discussion of the case.

Case Presentation

A 40-year-old male patient with a congenital right single kidney began follow-up in 2012 due to an incidental finding of a renal nodule. This renal lesion was described on abdominal ultrasound, measuring 1.4 cm, located in the middle third of the right kidney, with radiological characteristics suggesting renal angiomyolipoma. Serial imaging exams were performed for monitoring, which showed slow growth and no change in the benign characteristics of the lesion. The renal nodule remained under observation until November 2022, when a more significant increase in size was observed on abdominal magnetic resonance imaging, describing the nodule as heterogeneous with areas of reduced intensity and fat saturation measuring 4.6 cm × 4.4 cm × 3.9 cm, maintaining the diagnostic impression of angiomyolipoma, but not able to rule out another cause for the lesion.

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At this time, the patient still had urological follow-up at another hospital, and treatment of the lesion was not indicated despite the increased size and consequent high risk of rupture. On 01.02.2023, the patient sought emergency care at our hospital due to severe right flank pain and macroscopic hematuria. Hemodynamically stable, the patient underwent a new imaging exam (CT) that showed an expansive lesion on the lateral of the kidney, measuring 5.6 cm × 5.5 cm × 6.6 cm, with endophytic and exophytic components, near the collecting system and in contact with three arterial subdivisions (Figure 1). The radiology team suggested it could be a primary renal neoplasm or an angiomyolipoma with little fat. On the day after admission, due to clots in the renal pelvis, the patient developed acute renal failure with a serum creatinine of 7.3 ng/dL. At this time, a decision was made to perform a nephrostomy placement, resolving the acute renal failure within 48 hours, with normalization of the serum creatinine. Despite the complexity of the lesion, which scored 10 on the renal scale, and the fact that the patient had only one kidney, it was decided to proceed with surgical management. The recent bleeding indicated nodule rupture and there was a radiological suspicion of primary renal malignancy, so a partial nephrectomy was chosen as the preferred option. A right Robotic Partial Nephrectomy was performed. The surgery proceeded without complications, with a clamping time of 32

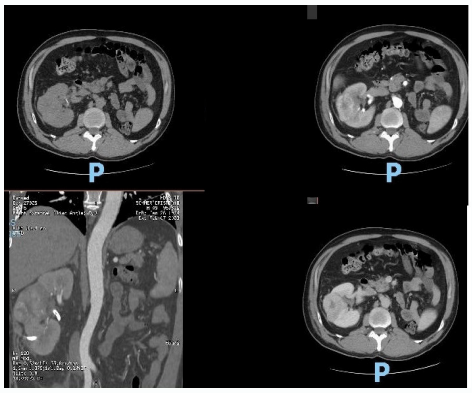

Figure 1: CT scan demonstrating the angiomyolipoma.

minutes and bleeding of 150 ml. The patient had good postoperative evolution with no significant changes in renal function and was discharged on the third day after surgery with a serum creatinine of 1.23 ng/dL. The pathological examination showed clear cell renal cell carcinoma, Fuhrman grade 2 and G2 (ISUP/WHO 2016 consensus), neoplasm size of 5.6 cm, with no infiltration of the renal capsule and free surgical margins. This histopathological finding reinforces the rare possibility of malignant transformation of an angiomyolipoma.

Discussion

Angiomyolipoma was first described in 1911 by Fischer in a histopathological analysis that described it as a tumor with blood vessels, smooth muscle, and adipose tissue, characterized as benign and with an incidence of 0.13% in the general population [2]. This tumor can occur sporadically or in association with tuberous sclerosis complex, sporadic lymphangioleiomyomatosis, or a combination of these two pathologies. When sporadic, the tumor is generally solitary, small, and slow growing, affecting patients between 40 and 60 years old [3]. Magnetic resonance imaging and computed tomography are accurate and specific for diagnosing angiomyolipoma, with MRI being beneficial in tumors with little fat content and not exposing the patient to ionizing radiation [4].

Although considered a benign tumor, it can also be histologically classified as typical (triphasic) or atypical (monophasic/epithelioid). Most angiomyolipomas contain varying proportions of all three components, i.e., dilated blood vessels, smooth muscle cells, and mature adipocytes. They are classified as triphasic tumors [5,6]. However, some tumors consist almost exclusively of one component, such as the epithelioid variant, which has few fat cells. Unlike typical lesions, these tumors may tend to malignant transformation and be locally aggressive [7]. The possibility of malignant degeneration is still not widely discussed among urologists.

The main complication is the tumor rupture with consequent retroperitoneal hemorrhage, which can be severe and potentially fatal and is directly related to the tumor size [8]. In most cases, a conservative approach with active surveillance is taken when treating the lesion. Asymptomatic lesions <4 cm can be observed, although it is generally accepted that symptomatic patients may require intervention. Surgical treatment or selective arterial embolization is reserved for lesions >4 cm, suspicion of malignant transformation, and women of childbearing age, mainly to reduce the risk of bleeding and preserve renal function [9-11].

Surgical options continue to be the best management for those patients in whom the intervention is indicated. With technological advances and improved techniques, a minimally invasive attempt should be made in all viable patients, as the literature has demonstrated that partial nephrectomy can preserve renal function and reduce overall mortality compared to other techniques [12].

Conclusion

Despite being a benign lesion, angiomyolipoma requires active surveillance, especially when it presents atypically with rapid growth and little fat content on imaging exams. Since histopathology can vary among angiomyolipomas, we cannot exclude the possibility of tumor malignancy transformation in our patient. Some studies in the literature cite malignant transformation and case reports, but there are still no significant articles for defining and changing the treatment of angiomyolipoma. Knowledge of malignant degeneration, even if uncommon, may enable a more significant number of cases in the future and with adequate statistical analysis. The nephron-sparing and robotic approach was essential for adequately managing the reported case, in which a complex lesion with great technical difficulty could be addressed, aiming for maximum renal preservation in a young patient with a single kidney.

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