CASE REPORT

Page kidney – A rare case of secondary hypertension caused by perinephric hematoma

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Abstract

About 5–10% of the cases of hypertension are caused due to a reversible secondary cause, especially in the younger population. A rare cause of secondary hypertension called page kidney, which is the external pressure on the kidneys causing the activation of renin-angiotensin-aldosterone system mechanism. We present a case of a 56 year old female, with a history of uncontrolled hypertension in spite of being on 4 antihypertensive medications. She presented to the Emergency Room with hypertensive emergency and acute left middle cerebral artery ischemic stroke, for which thrombolysis was done with alteplase, after her BP was controlled. An emergent computed tomography abdomen was done for flank pain showed an acute left perinephric hematoma secondary to angiomyolipoma with possible mass effect on the left kidney, raising the possibility of page kidney. She was managed conservatively with angiotensin-converting enzyme (ACE) inhibitors. She was managed conservatively with angiotensin-converting enzyme (ACE) inhibitors and a further workup was done to assess the possibility of secondary hypertension. Page kidney is caused by external compression of the kidney by any cause including retroperitoneal or subcapsular hematoma, tumor, and cyst. This is a unique case, in which the patient most likely was having perinephric bleed secondary to renal angiomyolipoma causing long-standing secondary hypertension but was incidentally detected when the patient developed further bleeding when she was given alteplase for stroke. As per literature, nephrectomy has been advised, but with the advent of ACE inhibitors, patients have been conservatively without any intervention.

Keywords: Page Kidney, perinephric hematoma, secondary hypertension

Introduction

American Heart Association/American College of Cardiology defines resistant hypertension as hypertension requiring three antihypertensive at full doses or requiring four antihypertensive medications.[1] In such cases, it is very important to rule out secondary causes of hypertension. As per the study done by Omura et al.,[2] secondary hypertension constitutes 9.1% of the cases of hypertension and this number rises to 30% in patients under 40 years of age diagnosed with hypertension.[3] One of the most important causes secondary hypertension is renal associated hypertension. Here, we present an interesting case of renovascular hypertension caused by a unique group of diseases called page kidney, which represents an external compression of the kidney due to any cause, leading to secondary hypertension.

Case Report

A 56-year-old female patient with significant medical history of difficult to control hypertension requiring four medications including calcium channel blockers, beta-blockers, ACE inhibitors, and hydralazine, presented to the emergency room with elevated BP and acute onset of the right facial droop and right arm weakness which started in the past 1 h. The laboratories including chemistry and hematology done were unremarkable. As the patient had a high suspicion for stroke, the stroke code was activated and the patient was rushed to the computed tomography (CT) scan of the head along with CT angiogram (CTA) of the head-and-neck vessels. No abnormalities were found on the CT head or CTA. Since the patient was within the window for thrombolysis and having a high NIHSS[4] of 7–8, the team of neurologist decided to proceed with thrombolysis. As per protocol, alteplase was given as a loading and infusion
which she tolerated without any complications. The patient was transferred to the intensive care unit (ICU) for strict monitoring for neurological recovery and also for blood pressure (BP) monitoring in the first 24 h with a BP goal of <180/105 mmHg. The patient had a good recovery with significant improvement in neurological deficits. The patient started complaining of acute severe left flank pain about 12 h after thrombolysis. Hence, emergency CT abdomen was done which showed an acute 12.4 cm left perinephric hematoma posteriorly from a 2.2 cm and left renal angiomyolipoma with associated mass effect on the left kidney [Figure 1].

Urology was consulted immediately, but no intervention was done as the patient had received alteplase and she was managed conservatively. Her symptoms resolved in the next 2–3 h. In the ICU, the patient required nicardipine infusion for a short duration to control the BP before she could be switched to oral medication. Magnetic resonance imaging brain done showed an acute left lacunar infarct. Once the patient was moved to the floor a repeat CT abdomen done showed stable moderate subcapsular left perinephric hematoma [Figure 2]. Urology followed up with the case and advised workup as an outpatient for page kidney as the cause of resistant hypertension. She was discharged on four antihypertensive medications to be followed up at the urology clinic.

Discussion

Page kidney as first described by Dr. Irvin Page in the year 1939 who experimented on dogs by applying cellophane tapes on the kidneys. He noticed that the BP in the femoral artery raised to as much as 240 mmHg; he also reported a drastic reduction in BP following nephrectomy. The kidney specimen showed a thick band of fibrous tissue surrounding the kidney. The same effect was not noted when he repeated the experiment with rubber gloves. This could suggest that not only an external compression but also a component of inflammation might be involved in its pathogenesis. Renovascular hypertension is a very important cause of secondary hypertension, but most commonly due to stenosis of the renal arteries. In page kidney, the external compression of the kidney parenchyma leads to ischemia of the kidney and causes activation of renin-angiotensin-aldosterone system (RAAS).

Any cause of external compression including hematoma, tumor, metastasis, and fluid can cause page kidney. When hematoma is considered, trauma is found to be the most common cause, but with the advent of new modalities of treatment, this form of disease is frequently found in patients undergoing intervention including renal biopsy and renal transplant, among others. Typically, it takes a mean of about 36 months from the onset of insult to the development of hypertension. This patient was having a resistant form of hypertension requiring four antihypertensive medication. It is unclear whether the angiomyolipoma was by itself causing the compression or if the bleeding from the tumor causing chronic subcapsular hematoma caused the page kidney, but it was picked up incidentally when the alteplase caused increased bleeding from the angiomyolipoma and made us look into the abdomen. Many treatment modalities have been explored, in the earlier days, surgical management was extensively used, with many patients undergoing complete or partial nephrectomy. Even image-guided evacuation of the hematoma has been attempted with varying level of success. Evacuation has been more successful with acute when compared to chronic hematoma, in which the formation of a fibrous capsule makes it less amenable to drainage, in which case capsulotomy has been described to help control BP. Since the activation of RAAS is the reason for hypertension, ACE inhibitor which acts by blocking this mechanism has been used successfully to control BP without the need for surgical intervention. As far as this patient is concerned, her BP was well controlled with antihypertensive medication including ACE inhibitor, raising the question if a surgical management is really indicated in her.

Conclusion

Page kidney is a rare cause of secondary hypertension and it should be suspected in all cases of renal hypertension as opposed to the popular belief of it being associated with traumatic events. Hence non traumatic events should also be considered as a differential diagnosis for page kidney. Non-surgical management is possible with the use of ACE inhibitor.

References