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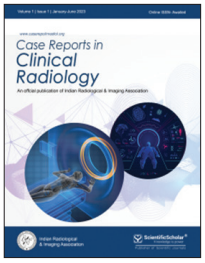

Case Report

Unusual presentation of subcapsular renal pseudocyst as page kidney – A case report

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ABSTRACT

Page kidney is a rare but potentially curable cause of secondary hypertension. While the pancreatic pseudocyst is a completely different and unrelated entity. Here, we report a case of a 45-year-old female, diagnosed with idiopathic acute pancreatitis with multiple pseudocysts. After successful ultrasound-guided drainage of her left subcapsular renal pseudocyst, she became normotensive again, confirming the diagnosis of page kidney. This case highlights dual reasons that prompted us to report the case. The first being such remotely located subcapsular renal pseudocyst as itself a rare entity and the second, its unusual presentation as page kidney. The case emphasizes on the early management of such patients so as to salvage renal function.

Keywords: Page kidney, Pseudocyst, Subcapsular, Intrahepatic, Hypertension

INTRODUCTION

Page kidney is an unusual and potentially treatable cause of secondary hypertension that is mediated by the activation of renin-angiotensin-aldosterone system. The system gets activated by ischemic insult to the kidney secondary to extrinsic renal parenchymal compression.[1] The most common cause of page kidney is subcapsular renal hematoma; either traumatic or iatrogenic. Other rarer cause is spontaneous and secondary to vascular malformation, tumor, aneurysm, vasculitis, pancreatitis, or anticoagulation.[2] It takes about 4–5 weeks to develop hypertension after renal parenchymal compression.[3] The patient may be completely asymptomatic or may present with a hypertensive crisis.[4] Intrahepatic and subcapsular renal pseudocyst locations following pancreatitis are rare[5] and fore knowledge of these entities clears the diagnostic dilemma. Subcapsular renal pseudocyst as a cause of page kidney is very rare and described as isolated cases only.

CASE REPORT

A 45-year-old female presented with pain epigastrium for 1 month. There was no history of nausea, vomiting, or fever. There were no urinary complaints. The patient was normotensive with no history of hypertension. The routine blood investigations were normal including normal renal function tests. However, serum lipase and amylase were significantly elevated making a clinical diagnosis of acute pancreatitis. Ultrasound showed a bulky heterogeneous pancreas with peripancreatic and left subcapsular renal collections. Due to the lack of any known etiological factor as per the history and diagnostic work up, a diagnosis of idiopathic acute pancreatitis

with peripancreatic fluid collections was made. For better anatomical delineation of fluid collections, magnetic resonance cholangiopancreatography (MRCP) was done [Figure 1]. It showed imaging features of acute pancreatitis with pseudocyst along the pancreatic body and tail region and a left subcapsular renal collection. As subcapsular renal pseudocyst is not a common entity, its fluid was aspirated which showed a markedly raised amylase level. As there was no communication with pancreatic duct and the patient was symptomatically better, she was managed conservatively.

The patient got admitted again after 3 months with a similar complaint of epigastric pain. Serum amylase, lipase, and renal function tests were normal. The patient had increased blood pressure (BP) on multiple readings during this second hospital admission with an average BP reading of around 150/104 mmHg. As the peripancreatic pseudocysts were persisting on repeat ultrasound, MRCP was done again to see any newly developed complication [Figure 2]. The new finding in the second MRCP was of intrahepatic collection in the left lobe. The left subcapsular renal pseudocyst had increased in size causing marked renal parenchymal compression. It was communicating with one of the peripancreatic pseudocysts. Since the patient had a negative basic work up for known causes of hypertension including normal renal artery and vein Doppler study; a possible diagnosis of page kidney was made. This diagnosis led to a change in the patient's management from conservative to active involving ultrasound-guided percutaneous pig tail drainage of this subcapsular renal pseudocyst. The patient was then discharged on antihypertensive drug (angiotensin II receptor blocker). Her antihypertensive drug was tapered and stopped over a period of 2 months when her serial BP monitoring showed a convincingly progressive decrease in BP. The patient is now no longer on antihypertensive medication.

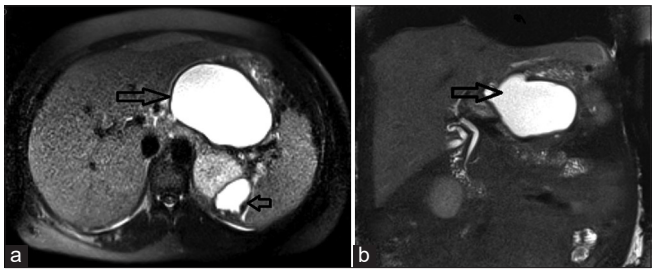

Figure 1: A 45-year-old woman with pseudocysts presenting with epigastric pain. Initial magnetic resonance cholangiopancreatography. (a) T2 haste axial image shows homogeneous fluid collection seen in the pancreatic body and tail region (long black arrow). The left subcapsular perirenal collection (short black arrow) is also seen. The liver is normal. (b) T2 haste coronal image shows peripancreatic collection (long black arrow).

DISCUSSION

Primary hypertension requires lifelong treatment with antihypertensive drugs. However, potentially treatable cause of secondary hypertension such as page kidney allows the patient to get off the medications over a short period as seen in our case. Page kidney may develop whenever there is extrinsic compression to renal parenchyma causing its hypoperfusion and microvascular ischemia. It leads to elevated renin levels in blood and activation of renin-angiotensin-aldosterone system (RAAS) causing secondary hypertension. The most common cause of page kidney used to be blunt abdominal trauma which now has shifted to iatrogenic causes such as renal biopsies, extracorporeal shockwave lithotripsies, renal and ureteral surgeries, and renal transplantations.[3] Spontaneous causes such as vascular malformations, tumors, anticoagulation, vasculitis, and pancreatitis are quite rare. Apart from the blood collection, other non-bleeding causes are urinomas, lymphoceles, paragangliomas, or large simple renal cysts.[2] However, the page kidney may be idiopathic with no obvious etiology available.[3] The renal function tests are usually normal if the other kidney is functional. The presentation may vary from completely asymptomatic causing silent end organ damage to hypertensive urgency or emergency which could be fatal.[4]

A pancreatic pseudocyst is an encapsulated fluid collection with fibrous wall and no solid content.[6] It usually occurs 4 weeks after the onset of interstitial edematous pancreatitis. It is seen in 5–15% patients following acute pancreatitis. The common location of pseudocyst of the pancreas is in its head or body region. About 20% of them are extrapancreatic, the

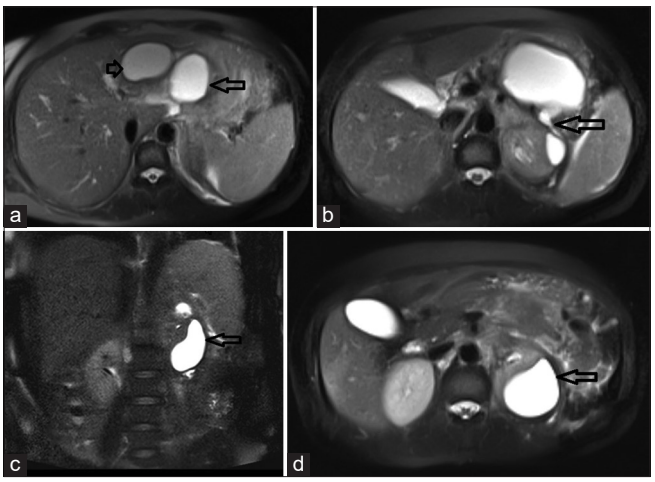

Figure 2: A 45-year-old woman with pseudocysts presenting with epigastric pain. Follow-up MRCP (a) T2 haste axial image shows intrahepatic (short black arrow) and peripancreatic (long black arrow) pseudocysts. (b) T2 haste axial image shows communication between peripancreatic and left subcapsular perirenal pseudocysts (black arrow). (c and d) T2 haste coronal and axial images show left subcapsular perirenal pseudocyst compressing on renal parenchyma (black arrow).

most common location being lesser sac, other being pleura, mediastinum, spleen, or pelvis.[7]

Renal subcapsular pseudocyst formation occurs when the pancreatic enzymes breech the Gerota's fascia, digest the perirenal fat, and then breech the renal capsule. The left-sided involvement is more common because of its close proximity with pancreatic tail. The right perirenal space is less commonly involved as the duodenum acts as an anatomical barrier.[6] If the collection is large enough to compress renal parenchyma, renal ischemia ensues, and it activates RAAS thus causing hypertension. The location of pseudocyst in the liver mostly involves the left lobe, the route of spread being from the pancreas through the hepatoduodenal or hepatogastric ligament to porta hepatis. The encompassing complications can be superadded infection, fistula formation, hemorrhage, rupture, or mass effect on adjacent biliary or portal system.[8]

Contrast enhanced computed tomography and MRCP are done for the proper anatomical location of the pseudocyst. Its communication with pancreatic duct can be seen on MRCP. In the absence of features of pancreatitis, its location at unusual places is a diagnostic challenge. In such a scenario, diagnosis can be made by aspiration of collection that reveals amylase rich fluid. There are no definite guidelines for the management of subcapsular renal or intrahepatic pseudocyst unlike peripancreatic pseudocyst. Management depends on size, location, mass effect and communication with pancreatic duct and on patient's stability. Most of them get resolved spontaneously. Earlier the treatment used to be radical nephrectomy but now more conservative approach to decompress renal parenchyma is being followed involving surgical, endoscopic, or image-guided percutaneous drainage of subcapsular renal collection. However, in chronic cases, there is formation of fibrocollagenous pseudocapsule that requires removal for effective renal decompression or even nephrectomy may have to be contemplated.[9] The associated hypertension may be permanent or temporary. Although no standard protocol has been set in the definitive management of page kidney, it should be prompt, more so, if there is a single functional kidney.

CONCLUSION

Given the sparse literature on subcapsular renal pseudocyst presenting as page kidney, a beforehand knowledge of this entity can aid in early diagnosis and refined management of the patients to prevent irreversible renal damage.

TEACHING POINTS

1. Page kidney is a rare cause of secondary hypertension caused by activation of RAAS due to renal parenchymal microvascular ischemia following its significant compression by any subcapsular renal collection
2. Pseudocysts in the unusual locations like subcapsular renal or intrahepatic are a diagnostic dilemma if not associated with imaging features of pancreatitis.

MCQs

1. The most common cause of page kidney is
   a. Subcapsular hematoma
   b. Subcapsular urinoma
   c. Subcapsular pseudocyst
   d. Subcapsular lymphocele

Answer key: a

2. All are true about page kidney except
   a. Page kidney may be asymptomatic
   b. Page kidney is a secondary cause of hypertension
   c. Page kidney should always be managed conservatively with antihypertensive medication only
   d. Page kidney may present with hypertensive crisis

Answer key: c

3. The treatment of page kidney is
   a. Conservative with watchful expectancy
   b. Image-guided percutaneous drainage of subcapsular collection
   c. Radical nephrectomy
   d. All of the above

Answer key: d

Ethical approval

Institutional Review Board approval is not required/waived-off.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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