CASE REPORT

Page kidney due to a renal pseudocyst in a setting of pancreatitis

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SUMMARY

Pancreatic pseudocysts are notorious for their extension beyond the normal confines of the pancreatic bed due to dissection of the enzymatic pseudocyst fluid along fascial planes. Such collections of pancreatic juice may compress the kidney. Extension of the pseudocyst into the perirenal space is, however, uncommon. We report a case of pseudocyst of pancreas lying in the subcapsular plane of the left kidney with a patent communication with the pancreatic duct (pancreaticorenal fistula). The compressive effect of the pseudocyst on the kidney compromised intrarenal perfusion as evidenced by a faint nephrogram but a normal renal artery. This led to renin–angiotensin–aldosterone mediated hypertension—the Page kidney phenomenon. Extensive literature search revealed our case to be the only one to describe such an occurrence.

BACKGROUND

A pseudocyst is a fluid collection secondary to pancreatitis. Renal subcapsular extension of a pancreatic pseudocyst is extremely rare. Page kidney refers to renin–angiotensin mediated hypertension due to renal hypoperfusion following long-standing compression of renal parenchyma by a subcapsular collection. We highlight the Page kidney phenomenon due to a renal pancreatic pseudocyst in a setting of pancreatitis, which has never been described in literature before.

CASE PRESENTATION

A 32-year-old man presented to our emergency services with epigastric pain of 2 weeks' duration. The pain was boring in nature and radiated to the back and the left flank. He was a chronic alcoholic. He was afebrile with a normal volume pulse. His blood pressure measured 118/76 mm Hg. The abdomen was tender on deep palpation with a lump in the left hypochondrium

INVESTIGATIONS

The serum lipase and amylase levels were 890 U/L (reference range: 40–290 U/L) and 563 IU/L (reference range: 25–125 IU/L), respectively. The blood counts, liver function tests and serum creatinine (0.7 mg/dL) were normal.

A contrast-enhanced CT (CECT) of the abdomen ([video 1](#)) depicted a subcapsular cystic lesion enveloping the left kidney. The left kidney was compressed with reduced cortical opacification (as compared with the right kidney) on the corticomedullary phase ([figure 1A](#)). The right kidney measured 9.6×4.6×4.1 cm (vertical×transverse×

Video 1 Contrast-enhanced CT of the abdomen showing the subcapsular cystic lesion enveloping the left kidney. The red circle highlights the pancreaticorenal fistula.

anteroposterior) while the dimensions for the left kidney were, respectively, 10.5×4.6×2.9 cm. There were a few small pseudocysts in the peripancreatic region. The splenic vein was not visualised and was replaced by numerous collaterals.

Since the pseudocyst communicated with the pancreatic duct (pancreaticorenal fistula), stenting of the duct was planned ([figure 2](#) reformatted image with arrow depicting the communication). The patient, however, did not consent for the procedure and took discharge against medical advice. He was lost to follow-up for the next 3 months, when he presented with multiple episodes of holocranial headache. There was no similar history of headache. There were no visual problems. He also gave a history of abdominal pain and fullness. He had no fever. His pulse was high volume and blood pressure was 172/126 mm Hg. There was a palpable lump in the left hypochondrium. Serum lipase and amylase levels were 450 U/L (reference range: 40–290 U/L) and 315 IU/L (reference range: 25–125 IU/L), respectively. Serum creatinine was 1.2 mg/dL. Liver function tests were normal.

A repeat CECT of the abdomen ([video 2](#)) was performed. The cortical opacification of the left kidney was significantly reduced as compared with the previous scan. The left subcapsular pseudocyst had increased considerably in size causing marked flattening of the kidney ([figure 1B](#)). The left kidney measured 12.8×2.6×2.1 cm (vertical×transverse×anteroposterior). A recent onset of hypertension with a markedly compressed kidney prompted estimation of serum renin levels. Plasma renin activity measured 5.8 ng/mL/h (1.31–3.59 ng/mL/h in supine position) and aldosterone was 490 pg/mL (40–310 pg/mL in supine position). The patient's serum potassium was 3.2 mEq/L (3.5–5 mEq/L).

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Figure 1 (A) Contrast-enhanced CT (CECT) of the abdomen depicting a subcapsular pseudocyst enveloping the left kidney. The left kidney is compressed with reduced cortical opacification (as compared with the right kidney) on the corticomedullary phase. (B) A repeat comparison CECT of the abdomen performed after 3 months shows that the cortical opacification of the left kidney has significantly reduced as compared with the previous scan. The left subcapsular pseudocyst has increased considerably in size causing marked flattening of the kidney.

TREATMENT

The patient was started on ramipril 5 mg once daily. The patient consented for duct stenting following which the pseudocyst was externally drained via a pigtail catheter (the fluid amylase and lipase measured 12 529 IU/L and 8504 IU/L, respectively).

OUTCOME AND FOLLOW-UP

Initially, there was no significant reduction in blood pressure levels after 1 month of treatment. The dose of ramipril was increased to 7.5 mg, with 2.5 mg in the morning and 5 mg at night. Salt restricted diet and lifestyle modifications were also suggested. Three months following pseudocyst drainage and with regular medication, at present, the patient's blood pressure has improved, having reduced to 136/92 mm Hg. The patient has been advised to continue the drug and follow-up.

DISCUSSION

Pancreatic pseudocyst is an accumulation of enzyme rich pancreatic succus enclosed by granulation tissue.¹ A lack of epithelial lining earns it the designation of a 'pseudocyst'. The source of the collection is disruption or obstruction of part of the ductal system with consequent extravasation into the pancreatic or peripancreatic region.² Alcoholic pancreatitis and trauma account for most of the encountered pseudocysts.² The pseudocyst may emerge in ectopic sites distant from the anatomic

Figure 2 Contrast-enhanced CT of the abdomen, reformatted image, showing the pseudocyst communicating with the pancreatic duct (pancreaticorenal fistula); the arrow depicts the communication.

Video 2 Repeat comparison contrast-enhanced CT of the abdomen performed after 3 months shows that the pseudocyst has significantly increased in size with marked compression of the left kidney as compared with the previous scan. The red circle highlights the pancreaticorenal fistula.

location of the pancreatic bed including the pelvis, mediastinum, intrahepatic, intrasplenic, intrarenal³ and perirenal spaces.⁴ The remarkable property of pancreatic enzymes to dissect the fascial planes accounts for these atypical locations.³ These pseudocysts at atypical sites pose a diagnostic and therapeutic challenge.⁵

Renal pseudocysts are rarely reported.¹ Michiel *et al* described well circumscribed perirenal fluid collections in only 2 of the 105 cases of pancreatitis that were evaluated by CT.⁶ Pseudocysts affecting the kidneys are more common on the left¹ since the left kidney shares a close anatomic relation with the pancreas; the duodenum being an anatomical barrier for the spread to the right side.⁵ Seepage of the autolytic enzymes beneath the renal fascia causes digestion of perirenal fat and renal pseudocyst formation.⁵ Such fluid collection in the perinephric space are difficult to diagnose clinically or radiographically with certainty. They mimic renal cysts^{2-4,7} or renal tumours.⁸

Perirenal pseudocysts may compress,⁹ displace,^{2,3,9} distort² or depress the kidney.⁴ Gorder and Stargardter reported two cases of pseudocyst deforming the upper pole of the left kidney.⁴ Other ways in which a pseudocyst can afflict the kidney include a pseudoaneurysm in the kidney,¹⁰ unilateral hydronephrosis by obstructing the urinary track¹¹ and direct rupture into the renal collecting system.¹²

Compression by the renal pseudocyst, however, has not yet been described as causing a Page kidney (Page induced hypertension in canine kidneys by wrapping them with cellophane).¹³ The designation refers to hypertension caused by external renal compression by a haematoma, tumour, lymphocele or urinoma.^{13,14} Page kidney typically occurs due to compression by a subcapsular haematoma. The haematoma arises as a complication of renal biopsy (currently the most common cause) or due to sports or motor vehicular trauma.¹⁵ Uncommon instances associated with warfarin therapy, polyarteritis nodosa and extracorporeal shockwave lithotripsy have also been described. Consequently, there is renal hypoperfusion; although the main renal artery is unaffected.^{13,15} This microvascular ischaemia causes a surge in renin levels, which switches on the renin-angiotensin-aldosterone cascade of hypertension. Treatment modalities include nephrectomy, evacuation of haematoma or medical management by blocking the renin-angiotensin-aldosterone pathway; nephrectomy is, however, not currently preferred.¹⁴ Hypertension is managed using ACE inhibitors or angiotensin receptor blockers.¹³⁻¹⁵ Relief of compression may be tried using minimal invasive techniques. The approach has to be aggressive in cases of a solitary native kidney

or renal allograft.¹⁵ Relief of compression, however, may not revert blood pressure back to normal if irreversible changes have occurred in the contralateral kidney.

We describe the Page phenomenon—occurrence of renin-angiotensin-aldosterone mediated hypertension by a subcapsular renal pseudocyst in a 32-year-old, chronic alcoholic man. Unlike previous reports of renal pseudocysts simulating renal cysts, diagnosis was certain in our case regarding the origin of the cyst since direct communication with the pancreatic duct (pancreaticorenal fistula) was visible on CT. The pancreatic duct was stented and the pseudocyst was externally drained. The patient was started on ACE inhibitors. To the best of our knowledge, such an occurrence has not been described previously.

Learning points

- ▶ Pancreatic pseudocysts result from disruption of the pancreatic ductal structure and accumulation of pancreatic juices. The unique property of pancreatic enzymes to dissect along fascial planes is responsible for atypical locations of pseudocysts, which are both a diagnostic as well as therapeutic challenge.
- ▶ Renal pseudocysts are a rarity. Perinephric pancreatic collections may resemble renal cysts and tumours, posing a diagnostic dilemma.
- ▶ Page kidney refers to the phenomenon of hypertension that develops following long-standing compression of renal parenchyma by any subcapsular renal collection due to activation of the renin-angiotensin system and has been typically described in association with a subcapsular haematoma, urinoma or seroma. We describe the Page kidney phenomenon secondary to a pancreatic pseudocyst, which has not been described in the literature before.

Competing interests None.

Patient consent Obtained.

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REFERENCES

- 1 Bhasin DK, Rana SS, Nanda M, *et al.* Endoscopic management of pancreatic pseudocysts at atypical locations. *Surg Endosc* 2010;24:1085–91.
- 2 Baker MK, Kopecky KK, Wass JL. Perirenal pancreatic pseudocysts: diagnostic management. *AJR Am J Roentgenol* 1983;140:729–32.
- 3 Munkelwitz R, Krasnokutsky S, Mohan E, *et al.* Unusual presentation of a pancreatic pseudocyst. A case report and review of literature. *Int J Pancreatol* 1997;21:91–4.
- 4 Rosenquist CJ. Pseudocyst of the pancreas: unusual radiographic presentations. *Clin Radiol* 1973;24:192–4.
- 5 Thandassery RB, Mothilal SK, Singh SK, *et al.* Chronic calcific pancreatitis presenting as an isolated left perinephric abscess: a case report and review of the literature. *JOP* 2011;12:485–8.
- 6 Feldberg MA, Hendriks MJ, van Waes PF, *et al.* Pancreatic lesions and trans fascial perirenal spread: computed tomographic demonstration. *Gastrointest Radiol* 1987;12:121–7.
- 7 Kiviat MD, Miller EV, Ansell JS. Pseudocysts of the pancreas presenting as renal mass lesions. *Br J Urol* 1971;43:257–62.
- 8 Naftel W, Ravera J, Herr HW. Pseudocyst of pancreas simulating a renal neoplasm. *Urology* 1975;5:417–19.
- 9 Farman J, Kutcher R, Dallemand S, *et al.* Unusual pelvic complications of a pancreatic pseudocyst. *Gastrointest Radiol* 1978;3:43–5.
- 10 Abrol N, Seth A, Sharma S. Pseudoaneurysm kidney: a rare complication of pseudopancreatic cyst. *Urology* 2012;79:111–12.
- 11 Matsumoto F, Tohda A, Shimada K, *et al.* Pancreatic pseudocyst arising from ectopic pancreas and isolated intestinal duplication in mesocolon caused hydronephrosis in a girl with horseshoe kidney. *J Pediatr Surg* 2005;40:e5–7.
- 12 Gregoire M, Rosenberg L, Haegert D, *et al.* Pancreatic pseudocyst rupture into the renal collecting system. *Pancreas* 1989;4:751–4.
- 13 Brotfain E, Koyfman L, Frenkel A, *et al.* Traumatic page kidney induced hypertension in critical care: immediately resolved or long-term resistant problem. *Case Rep Crit Care* 2013;2013:201424.
- 14 Kenis I, Werner M, Nacasch N, *et al.* Recurrent non-traumatic page kidney. *Isr Med Assoc J* 2012;14:452–3.
- 15 Posadas MA, Yang V, Ho B, *et al.* Acute renal failure and severe hypertension from a page kidney post-transplant biopsy. *Scientific World Journal* 2010;10:1539–42.

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