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Case Report

Radiology Section

Bowel Obstruction Unveiling the Hidden Burden of Polycystic Kidney Disease: A Case Report

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ABSTRACT

Polycystic Kidney Disease (PKD), particularly Autosomal Dominant Polycystic Kidney Disease (ADPKD), is a genetic disorder that can lead to kidney enlargement and, ultimately, End-Stage Renal Disease (ESRD). The enlargement of these cysts can exert pressure on adjacent structures, including the gastrointestinal tract, which can lead to a range of gastrointestinal complications, including bowel obstruction. We describe the presentation of a 58-year-old male with Chronic Kidney Disease (CKD), hypertension, anaemia, and hepatitis B, who developed symptoms of weakness, somnolence, vomiting, and anorexia. Upon examination, the patient exhibited signs of dehydration and altered mental status without acute abdominal pain. Blood tests revealed worsening renal function, electrolyte imbalances, and anaemia. Imaging demonstrated significant intestinal distension due to mechanical obstruction, most likely caused by compression from large cysts associated with ADPKD. The patient was managed with fluid and electrolyte replacement, continuous dialysis, and monitoring of mental status. An interventional radiology procedure was performed to relieve the obstruction through percutaneous pigtail drainage of the right lower pole cyst. A surgical consultation was sought for potential intervention. This case report highlights the often-overlooked gastrointestinal complications of ADPKD, emphasising bowel obstruction as a hidden burden of the disease and the importance of early diagnosis and a multidisciplinary approach to prevent the deterioration of the patient's condition.

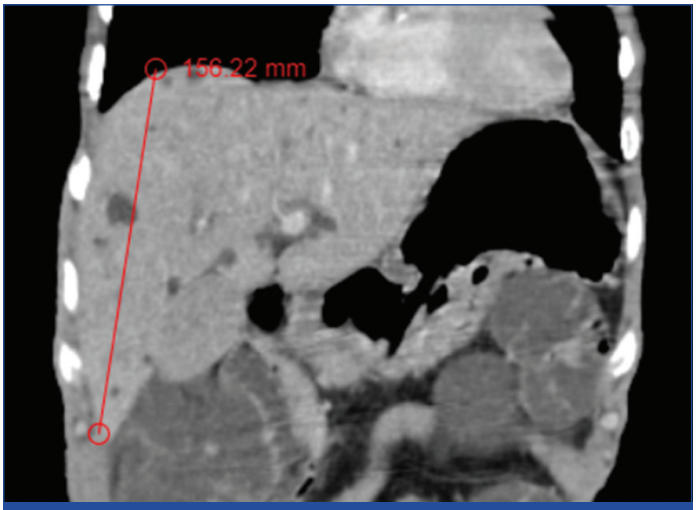
Keywords: Anorexia, Chronic kidney disease, Kidney cysts, Pig tail drainage, Vomiting

CASE REPORT

A 58-year-old male with a history of CKD was admitted with 2-3 episodes of vomiting, which were watery (blackish), along with drowsiness, disorientation, and a decreased appetite over the past three days. His past medical history included systemic hypertension for seven years, anaemia for eight years, and a positive hepatitis B status for four years. The patient had been on regular haemodialysis for CKD for five years. A previous ultrasound suggested adult PKD, and he had been on regular follow-up since then. Earlier, the kidney cysts were comparatively small and had not caused obstruction.

Upon examination, the patient appeared lethargic and dehydrated but did not exhibit acute abdominal tenderness, guarding, or peritoneal signs. His vital signs were as follows: blood pressure of 90/60 mmHg (hypotensive), heart rate of 110 beats per minute (tachycardic), respiratory rate of 20 breaths per minute, and a temperature of 36.8°C. Hypotension and tachycardia were managed with intravenous fluid resuscitation. Laboratory investigations revealed worsening renal function, with a Blood Urea Nitrogen (BUN) of 85 mg/dL and serum creatinine of 7.5 mg/dL. Haemoglobin levels had dropped to 7.8 g/dL, indicating worsening anaemia. Electrolyte imbalances included hyperkalaemia (serum potassium 5.8 mEq/L), hyponatraemia (serum sodium 128 mEq/L), and metabolic acidosis (serum bicarbonate 14 mEq/L). Liver function tests showed mildly elevated transaminases, consistent with his known hepatitis B status.

A Contrast-Enhanced Computed Tomography (CECT) scan of the abdomen and pelvis revealed mild hepatomegaly with multiple simple cysts in both liver lobes [Table/Fig-1], the largest measuring 27×21 mm in the left lobe. Both kidneys were enlarged with numerous peripherally enhancing cysts, some with peripheral calcifications, indicative of PKD [Table/Fig-2]. The delayed phase imaging showed no contrast excretion from either kidney, confirming the patient's ESRD [Table/Fig-3]. The CT scan also demonstrated compression of the proximal ascending colon by the enlarged right kidney [Table/Fig-4], causing marked dilatation of the caecum [Table/Fig-5], ileum [Table/Fig-6], and jejunum [Table/Fig-7] loops. This compression resulted in bowel obstruction, as evidenced by the dilated bowel loops and impaired peristalsis.

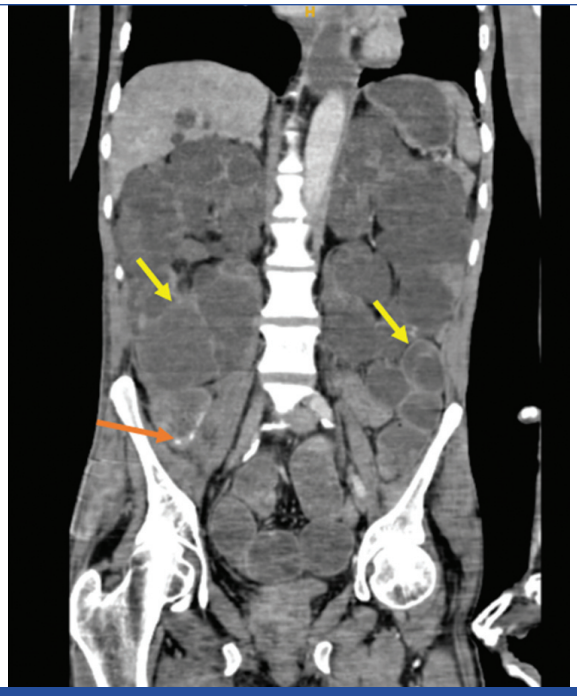


[Table/Fig-1]: CECT- coronal section- venous phase- multiple variable sized non-enhancing cysts noted in bilateral lobes of liver with mildly enlarged liver -15.6 cm s/o hepatomegaly.

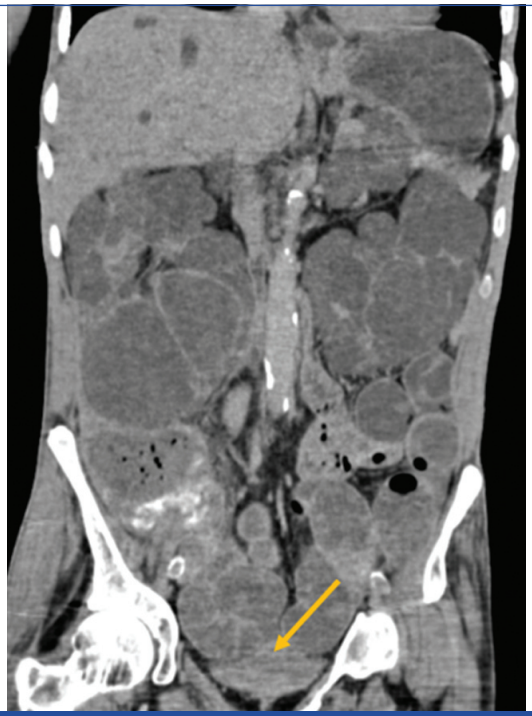
The patient was diagnosed with bowel obstruction secondary to compression caused by his enlarged polycystic kidneys. His altered mental status was managed with supportive care, including fluid resuscitation, electrolyte correction, and continued dialysis. His gastrointestinal symptoms were addressed conservatively, with close monitoring for further deterioration.

Given the significant compression and obstruction caused by the enlarged right kidney, an interventional radiology procedure was performed. A percutaneous pigtail drainage catheter was placed in the right lower pole cyst to relieve the pressure and alleviate the obstruction. This intervention was successful in improving the patient's symptoms.

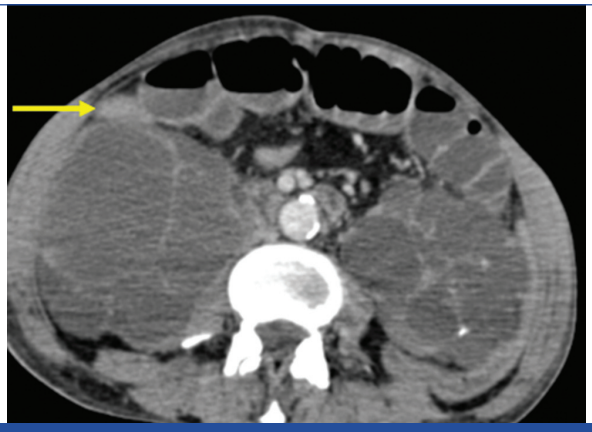
A multidisciplinary team, including nephrologists, gastroenterologists, interventional radiologists, and surgeons, was consulted for further management.



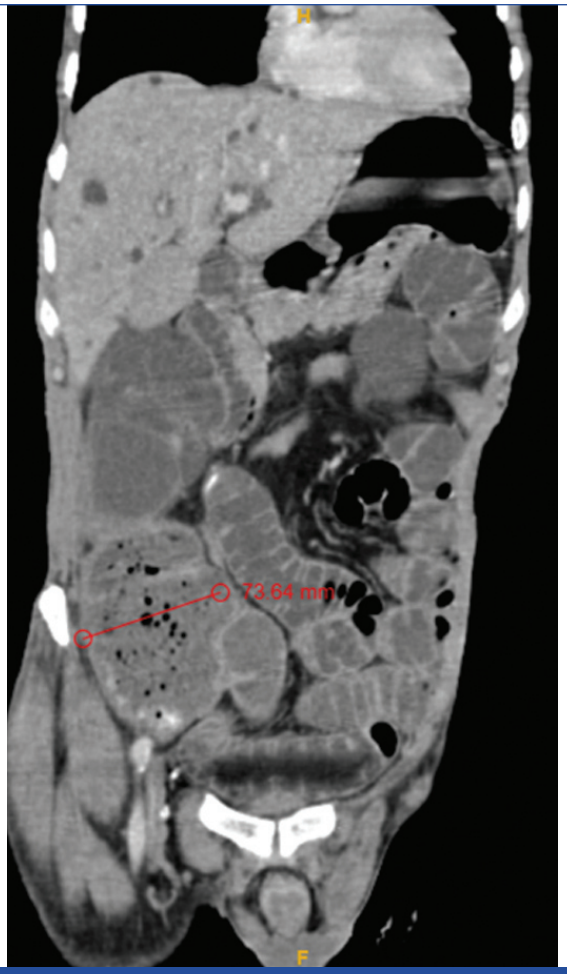
[Table/Fig-2]: CECT- coronal section- venous phase- Both kidneys are enlarged with numerous peripherally enhancing cysts (yellow arrow), some with peripheral calcifications (orange arrow), indicative of Polycystic Kidney Disease (PKD).



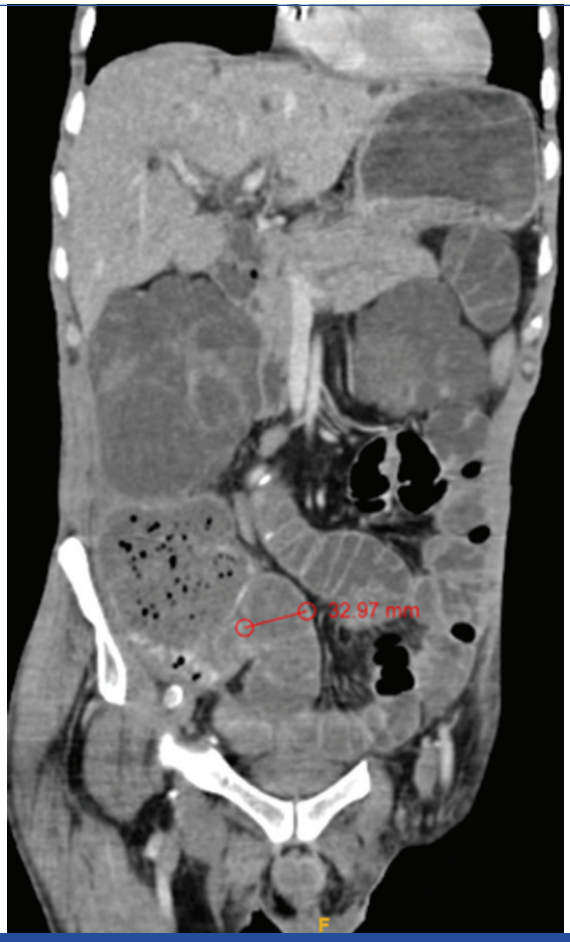
[Table/Fig-3]: CECT- coronal section- delayed phase- it shows no contrast excretion in urinary bladder (orange arrow)- consistent with CKD findings.



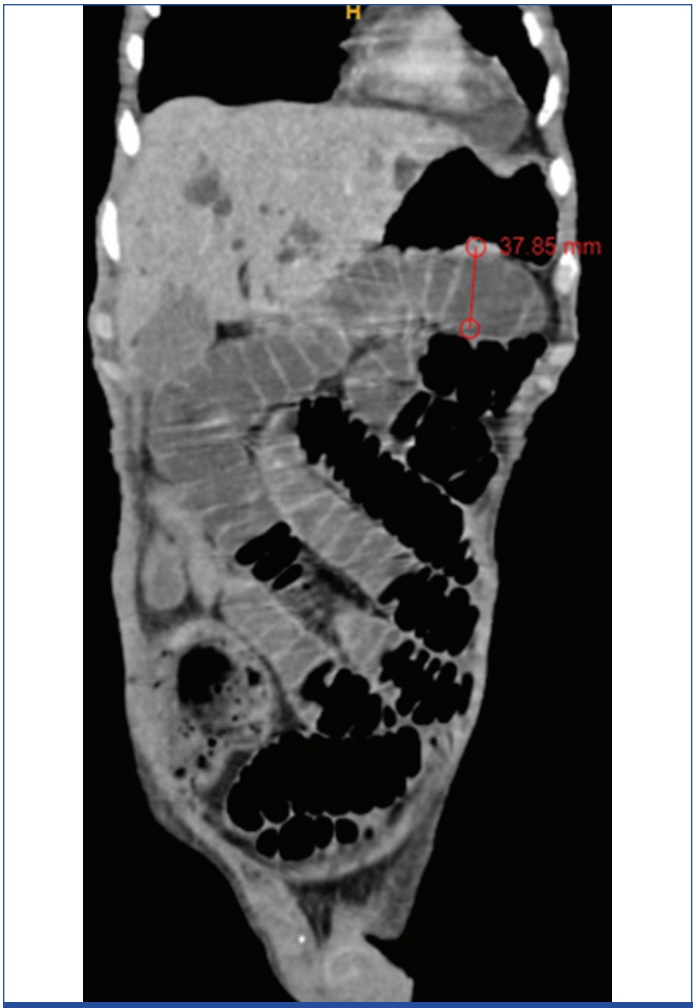
[Table/Fig-4]: CECT- axial section- venous phase- compression of the proximal ascending colon (yellow arrow) by the enlarged right kidney cyst.



[Table/Fig-5]: CECT- coronal section- venous phase- right polycystic kidney compressing ascending colon (as shown in [Table/Fig-4]) causing marked dilatation of the cecum (approx. 7.4 cm).



[Table/Fig-6]: CECT- coronal section- venous phase- showing dilated ileum approx. 3.3 cm s/o obstruction.



[Table/Fig-7]: CECT- coronal section- venous phase- showing dilated jejunum approx. 3.7 cm s/o obstruction.

DISCUSSION

PKD, particularly Autosomal Dominant Polycystic Kidney Disease (ADPKD), is a genetic disorder characterised by the formation of fluid-filled cysts in the kidneys, which can lead to kidney enlargement, renal impairment, and ultimately, End-Stage Renal Disease (ESRD). Although PKD typically affects the kidneys, the enlargement of these cysts can exert pressure on adjacent structures, including the gastrointestinal tract [1]. This can lead to a range of gastrointestinal complications, including bowel obstruction, as demonstrated in this case.

Ileal volvulus, a rare form of small bowel volvulus, is an intestinal blockage that can result in constipation, vomiting, distension, and abdominal discomfort. The clinical presentation was exacerbated by the patient's comorbid ADPKD [2]. Treatment may include detorsion, resection if ischaemic, and exploratory laparotomy [2]. In this instance, only detorsion was performed due to the health of the bowel.

ADPKD is one of the most common hereditary kidney diseases and the fourth most common cause of ESRD [3]. Extrarenal manifestations of this systemic condition can include diverticular disease, inguinal and ventral hernias, pancreatic cysts, polycystic liver disease, and large bile duct abnormalities [4]. These gastrointestinal problems can significantly impact disease burden, especially in later age. As ADPKD gains recognition, gastroenterologists need to understand how the disease affects the digestive tract [5].

With an increased life expectancy, ADPKD, a disorder marked by cysts in organs other than the kidneys, may become increasingly clinically significant. The seminal vesicles, pancreas, arachnoid membrane, spinal meninges, and liver can all harbour these cysts [4]. Additionally, they may result in abnormalities in connective tissue. By identifying these signs, patients may avoid unnecessary tests or receive preventative or therapeutic interventions, such as screening, treatment, or, in extreme cases, estrogen avoidance [6].

A 53-year-old man with chronic renal insufficiency had a massive polycystic kidney that weighed 4,250 grams and caused acute intestinal blockage. Rather than adhesions or ischaemia, external compression was the source of the blockage. With a successful unilateral nephrectomy, the patient's symptoms were alleviated, and he was prepared for a kidney transplant. This case highlights the importance of exploring surgical techniques and considering uncommon presentations when managing PKD [7].

Bowel obstruction in ADPKD is a rare complication, but it can occur when the enlarged kidneys compress nearby structures [7]. In our case, the patient developed obstruction due to the enlarged right kidney pressing against the proximal ascending colon, which caused significant dilatation of the bowel.

It was determined that the patient's bowel blockage was caused by compression from the larger right kidney; no other factors, including a history of abdominal surgery or hernias, were implicated. The mechanical blockage was resolved once the cysts decompressed. The lack of distinctive imaging features or systemic inflammatory indicators led to the exclusion of gastrointestinal disorders such as diverticulitis, Inflammatory Bowel Disease (IBD), or mesenteric ischaemia. While electrolyte imbalances and dehydration were treated, they did not relieve the blockage. Neurological symptoms were linked to uraemia and resolved with dialysis. Infection-related causes, such as sepsis or complications from hepatitis, did not match the clinical presentation [8]. The blockage was not significantly exacerbated by minor liver cysts.

Without imaging, gastrointestinal symptoms may have been mistaken for CKD-related problems, potentially delaying diagnosis and treatment. Therefore, imaging was essential in identifying the patient's symptoms. Timely supportive therapy, such as dialysis, vigilant monitoring, and fluid and electrolyte management, was facilitated by the early identification of intestinal blockage.

CONCLUSION(S)

Bowel obstruction is a serious complication of ADPKD, and this case emphasises the critical role of early detection and a multidisciplinary approach—including appropriate imaging—in diagnosing and treating such cases to minimise further morbidity and improve patient outcomes. To alleviate bowel obstruction and relieve symptoms in this patient with ESRD, percutaneous pigtail drainage, an interventional radiology procedure, was performed. Supportive treatment was essential, including ongoing dialysis and fluid resuscitation. The patient was conservatively managed despite the potential for surgical intervention due to his delicate state, highlighting the significance of prompt, thorough care.

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