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Massive bilateral polycystic kidneys, successful treatment with embolization and nephrectomy: A case report

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ABSTRACT

Polycystic kidney disease (PKD) is a genetic disorder characterized by the formation of multiple cysts in the kidneys. We present a case of a 47-year-old male with PKD on dialysis who underwent bilateral renal artery embolization followed by bilateral nephrectomy via a median incision. The specimen weight was 5 kg for the left kidney and 8 kg for the right one. Renal artery embolization can be a useful tool in managing polycystic kidney disease in cases where nephrectomy is indicated. This case highlights the importance of timely intervention and the role of minimally invasive techniques in managing this rare condition.

1. Introduction

Polycystic kidney disease (PKD) is a genetic disorder characterized by the growth of cysts in the kidneys, which can lead to chronic kidney disease (CKD) and end-stage renal disease (ESRD). Giant PKD is a rare variant of the disease characterized by extremely large cysts that can cause severe complications, such as pain, hematuria, and infection. The management of bilateral polycystic kidney disease is challenging, and the treatment options depend on the stage of the disease, the severity of symptoms, and the patient's overall health status. We present a case of a 47-year-old man on dialysis who underwent bilateral embolization of renal arteries and subsequent bilateral nephrectomy for giant PKD.

2. Case presentation

A 47-year-old man with a history of PKD had been on dialysis for two months. He presented with abdominal pain and hematuria. Physical examination revealed abdominal distension and bilateral flank tenderness. Laboratory tests showed elevated serum creatinine levels and a drop in hemoglobin levels needed blood transfusions.

Imaging studies on CT scans revealed massive bilateral renal enlargement measuring 36 cm and 39 cm for the right and left kidneys, respectively, with numerous large cysts, some are of hemorrhagic content with parietal enhancement suspecting an infection consistent with giant PKD (Fig. 1). Given the patient's poor renal function and the high risk of complications associated with giant PKD, a decision was made to proceed with bilateral embolization of renal arteries followed by bilateral nephrectomy.

The patient was taken for bilateral embolization of renal arteries (Fig. 2) followed by immediate bilateral nephrectomy by median incision. During surgery, both kidneys were found to be extensively involved with cysts, and there was no evidence of viable renal tissue. A bilateral nephrectomy was performed, and the patient was transferred to the intensive care unit for postoperative care. The surgical specimens weighed 5 kg and 8 kg for the left and right kidneys, respectively (Fig. 3). Histopathological examination confirmed the diagnosis of polycystic kidney disease.

The patient had an uneventful recovery and was discharged on postoperative day 7. Following the procedure, the patient remained on dialysis and was closely monitored for any signs of complications. Regular follow-up appointments were scheduled to monitor the patient's renal function, blood pressure, and electrolyte levels. Additionally, the patient was advised to maintain a healthy lifestyle, including regular exercise and a low-sodium diet, to reduce the risk of cardiovascular events.

3. Discussion

Bilateral polycystic kidney disease (BPKD) is a hereditary disorder characterized by the growth of multiple cysts in both kidneys, leading to organ enlargement and eventual loss of function. BPKD affects approximately 1 in 1000 individuals worldwide and is responsible for 5–10% of

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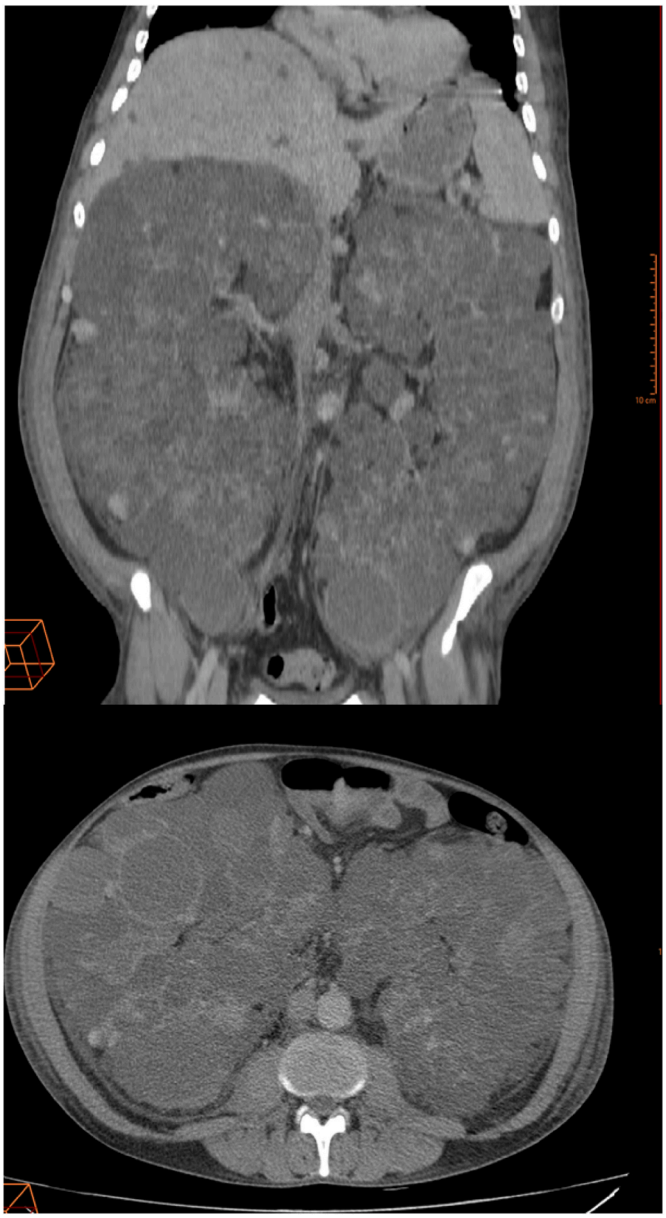

Fig. 1. Abdominopelvein CT scan of multicystic kidneys with the almost complete destruction of the parenchyma, some cysts are of hemorrhagic content with parietal enhancement suspecting an infection.

all end-stage renal disease (ESRD) cases requiring renal replacement therapy.[1] The clinical presentation of BPKD can vary widely, from asymptomatic patients to those with severe abdominal pain, hypertension, and renal failure. The management of BPKD is complex and requires a multidisciplinary approach, including nephrologists, urologists, and transplant surgeons. The treatment options depend on the stage of the disease, the severity of symptoms, and the patient's overall health status.

The current management of BPKD includes conservative management, medical therapy, dialysis, and renal transplantation. Conservative management includes regular monitoring of kidney function, blood pressure control, and symptomatic relief with analgesics. Medical therapy includes the use of angiotensin-converting enzyme inhibitors or angiotensin receptor blockers to reduce proteinuria and slow the progression of renal disease. Dialysis, either hemodialysis or peritoneal dialysis, is indicated in patients with ESRD who are not suitable candidates for renal transplantation.[2]

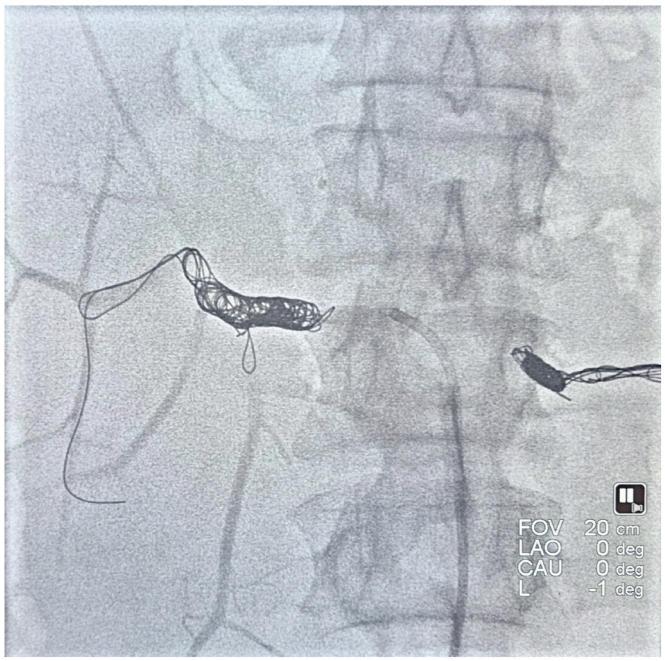

Fig. 2. Radiographic image showing bilateral embolization of renal arteries.

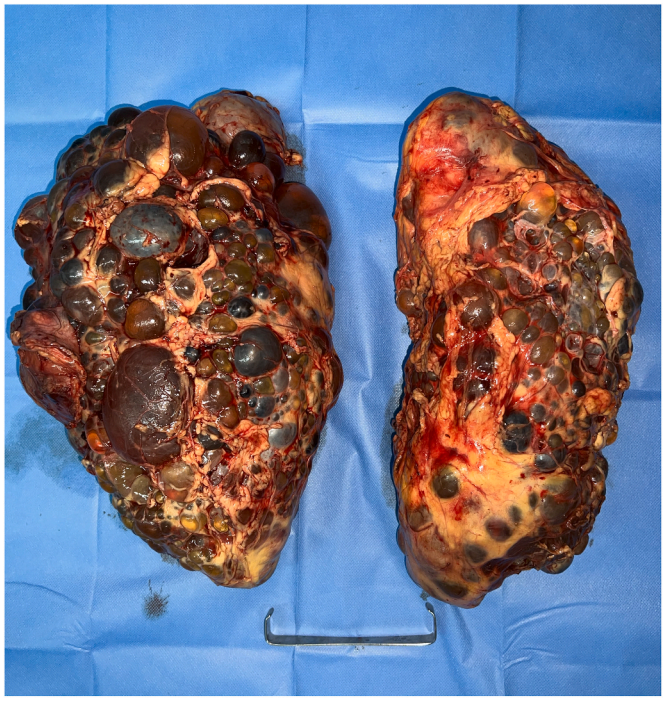

Fig. 3. **:** Macroscopic aspect of the specimens weighed 5 kg and 8 kg for the left and right kidneys, respectively.

Renal transplantation is the definitive treatment for BPKD and is associated with improved patient survival and quality of life compared to dialysis.[3,4] However, not all patients with BPKD are suitable candidates for renal transplantation, due to factors such as comorbidities, age, and availability of donors. In such cases, bilateral nephrectomy may be necessary to relieve symptoms and prevent complications such as infection, bleeding, or rupture of cysts.

Bilateral nephrectomy is a major surgical procedure associated with significant morbidity and mortality. In addition, it may result in acute and chronic complications such as volume depletion, electrolyte

imbalances, hypotension, and sepsis. Therefore, the use of adjunctive techniques to reduce the size and vascularity of polycystic kidneys and minimize the risk of bleeding during nephrectomy has been explored.

One such technique is renal artery embolization (RAE), which involves the occlusion of the renal arteries with embolic agents such as polyvinyl alcohol (PVA) or coils. RAE reduces the blood flow to the polycystic kidneys and has been reported to be effective in reducing the size and vascularity of polycystic kidneys, thus facilitating the subsequent nephrectomy.[4] In addition, RAE may improve the postoperative outcomes by reducing the risk of intraoperative bleeding and blood transfusions, shortening the operative time, and decreasing the hospital stay.[4]

However, the use of RAE in patients with BPKD is controversial, and its long-term effects on renal function and hypertension are unknown.[4,5] Moreover, RAE may not be suitable for all patients, especially those with bilateral involvement, diffuse cystic disease, or solitary kidneys.[5] Therefore, the decision to perform RAE should be made on a case-by-case basis, taking into account the patient's individual characteristics and preferences, as well as the expertise and experience of the treating team.

In our case, we performed bilateral embolization of renal arteries followed by immediate bilateral nephrectomy to reduce the vascularity of polycystic kidneys and minimize the risk of bleeding during the nephrectomy. The patient had an uneventful recovery and was discharged on postoperative day 7. However, further studies are needed.

4. Conclusion

Bilateral polycystic kidney disease is a challenging condition to manage, and the treatment options depend on the stage of the disease and the patient's overall health status. Bilateral embolization of renal arteries followed by immediate bilateral nephrectomy may be a viable treatment option in selected patients with enormous polycystic kidneys. Further studies are needed to evaluate the long-term outcomes of this approach.

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