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CASE REPORT

Whipple's Procedure in a Renal Transplant Recipient with Polycystic Liver Disease

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ABSTRACT

Context Polycystic disease is a rare disorder, which most commonly manifests in the kidney and liver. Recently an increased risk for pancreatic malignancies in subsets of patients with polycystic disease has been reported.

Case report We report a patient with polycystic liver and kidney disease who successfully underwent a Whipple's procedure for pancreatic adenocarcinoma.

Conclusion Although technical difficulty may increase, pancreaticoduodenectomy can be safely performed in patients with polycystic liver disease.

INTRODUCTION

Pancreatic resection remains associated with a high morbidity, particularly in patients with underlying comorbidities or those who have had previous abdominal surgery [1, 2]. Polycystic disease is a rare disorder, which most commonly manifests in the kidney [3, 4]. The liver is the second most commonly involved organ [5]. Polycystic kidney disease is a common indication for kidney transplantation and frequently requires bilateral nephrectomy due to pain, hemorrhage into cysts or infection of the cysts [6, 7]. Hepatic cysts can be treated by percutaneous drainage, laparoscopic de-roofing, or liver resection and occasionally, polycystic liver disease can lead to complications that require liver transplant-ation [8, 9]. Some authors have suggested combined liver/kidney transplantation if both organs are involved [10].

Recently, an increased mortality rate due to other malignancies has been reported in patients who previously underwent renal transplantation for polycystic kidney disease [11]. Among these patients, one patient died from pancreatic cancer [11]. In particular, for polycystic kidney disease Potter III patients an increased rate of developing pancreatic cancer is well established [12, 13]. Polycystic livers can grow to an enormous size and occupy a large amount of the available intra-abdominal space [14]. This results in significant discomfort for the patient and dislodgement of other intra-abdominal organs with distortion of the vascular anatomy. Frequently, the entire small and large bowels are forced into the left lower quadrant. Understandably, liver transplantation in these cases is technically challenging especially when dealing with a liver weighing as much as 20 kilograms [8]. Similarly, any upper gastrointestinal tract procedure must be considered difficult due to the lack of space and the abnormal anatomy [15]. We report a

patient with polycystic liver and kidney disease who successfully underwent a Whipple's procedure for pancreatic adenocarcinoma.

CASE REPORT

The patient was a 71-year-old slightly obese African American female with polycystic liver and kidney disease. She underwent bilateral native nephrectomy with splenectomy in 1997 and subsequently a cadaveric kidney transplantation in 1999. Graft function was excellent and the current immunosuppression consisted of triple drug therapy including cyclosporine A with trough levels between 50 and 100 ng/mL, mycophenol-mofetil (2 g daily), and prednisone (5 mg daily). Because of persistent abdominal pain over the last four years, she had multiple percutaneous cystotomies and ablations of liver cysts. In November 2005, the patient presented with symptoms of cholangitis and sepsis. Ultrasound of the right upper quadrant revealed a dilated common bile duct and a markedly enlarged liver with multiple cysts replacing virtually all of the normal hepatic parenchyma. An endoscopic retrograde cholangiopancreatogram (ERCP) was then performed which confirmed the long distal common bile duct stricture (Figure 1).

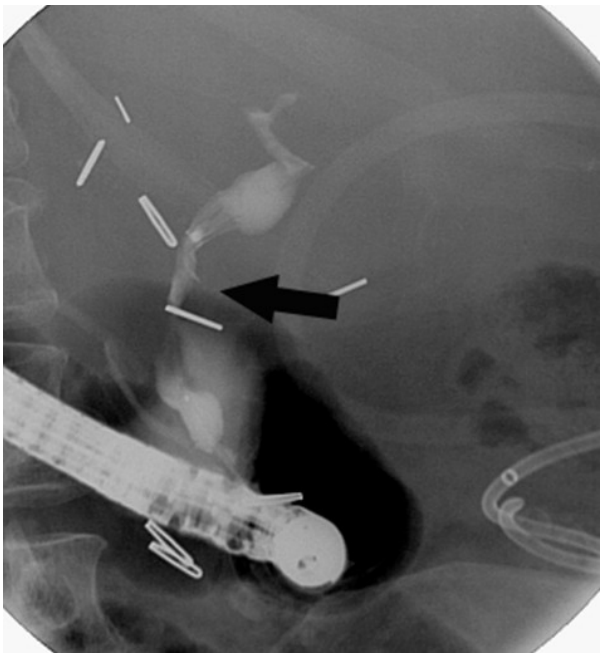

Figure 1. ERCP: stenosis of the common bile duct.

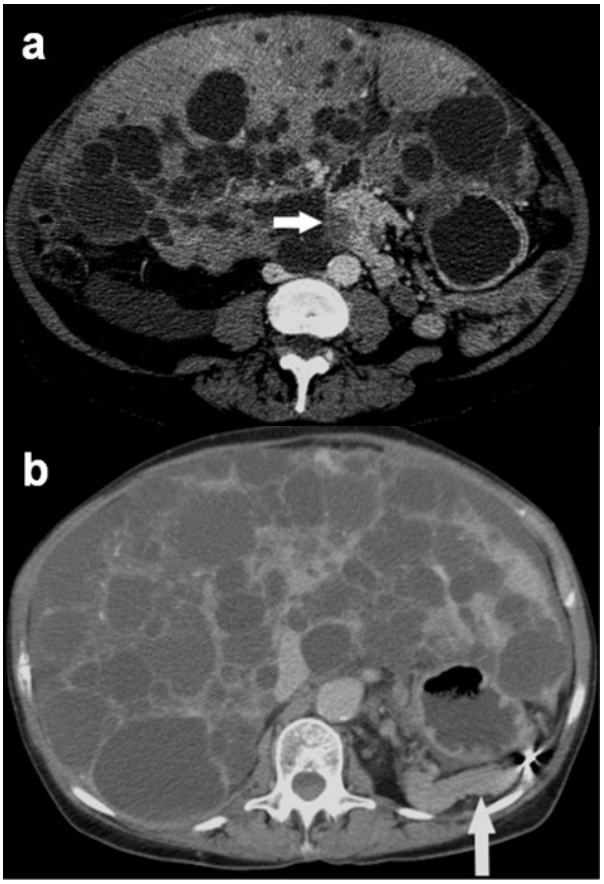

Figure 2. CT scan. **a.** Pancreatic mass. **b.** Polycystic liver with dislocation of intra-abdominal organs.

Brushings were obtained and a 10 French biliary endoprosthesis was placed. Pathologic examination of the brushings revealed adenocarcinoma.

Further investigations included a computed tomography (CT) scan (Figure 2) showing a hypodense mass measuring 1.8x2.2 cm in the head of the pancreas and a massive liver with multiple intrahepatic cysts. A FDG-PET scan revealed a focus of intense hypermetabolic activity correlating with the pancreatic head mass seen on CT. An endoscopic ultrasound demonstrated a 1.8x1.6 cm hypoechogenic mass in the head of the pancreas. There was some focal dilation of the proximal pancreatic duct. No peripancreatic lymphadenopathy was identified.

In December 2005, the patient underwent pancreaticoduodenectomy. A bilateral subcostal incision was used to access the abdominal cavity. Because of the polycystic liver disease and the extremely enlarged liver, the right hepatic lobe extended caudally

across the midline pushing all intra-abdominal organs inferiorly and to the left. A classical pancreaticoduodenectomy including a thorough retroperitoneal lymph node dissection was carried out despite the enormous size of the liver. After mobilization of the right hemicolon and completion of Kocherization of the duodenum, the gallbladder was taken down and the common bile duct was divided immediately below the insertion of the cystic duct. The proximal bile duct was submitted for frozen section that was negative. During the reconstruction phase, pancreatic and biliary stents were placed across the respective anastomoses and externalized through the right abdominal wall. A Jackson-Pratt drain was placed beneath the pancreaticojejunostomy and brought out through the left abdominal wall. The intraoperative course was unremarkable and the patient was returned to the surgical intensive care unit and was extubated on the following day without incident. The final pathology revealed a 2.3 cm pancreatic adenocarcinoma with three of 21 lymph nodes positive for metastatic disease. The final staging was pT3N1M0, G2.

Stress steroid doses were given perioperatively and tapered to the baseline level. Her postoperative course was complicated by poor nutritional intake and oral herpes simplex virus infection. The herpes simplex virus infection was successfully treated with acyclovir 400 mg twice daily. The function of the kidney allograft remained stable throughout her hospitalization with measured creatinine levels less than 1.0 mg/dL. She was discharged four weeks later. She was doing well at three months follow up and conversion of immunosuppression to a mammalian target of rapamycin (mTOR) inhibitor was discussed. Unfortunately, the patient expired due to cardiac failure unrelated to the surgical procedures few weeks later.

DISCUSSION

This case shows the feasibility of pancreatic resection in a patient with a massively enlarged polycystic liver who suffers multiple comorbidities and has undergone kidney transplantation. Her postoperative course was prolonged but she ultimately recovered well, however she died unrelated to the surgical procedure from her underlying comorbidities.

Several aspects make this case unique. First, little is known on the development of pancreatic cancer following solid organ transplantation [15]. However, there is evidence that patients with polycystic diseases have an increased risk of developing a pancreatic malignancy [16, 17]. Second, it is not known whether the conventional immunosuppression with calcineurin inhibitor would promote pancreatic malignancy. Recent reports show that mTOR inhibitors do have an antitumor effect [18]. It has thus been suggested that patients who develop *de novo* post-transplant malignancies should be switched to sirolimus or everolimus [19]. Sirolimus may have a beneficial impact on the course of pancreatic cancer [20]. Sirolimus as part of the chemotherapeutic regimen may be superior to the standard regimen included gemcitabine [21]. However, judious care must be taken when using mTOR inhibitors during the immediate postoperative period due to the antiproliferative effects that may result in severe wound healing disturbances [22]. A failure of pancreatic anastomosis can lead to disastrous complications [23].

The third interesting aspect in this case is the surgical procedure. Due to previous bilateral nephrectomies and a splenectomy, there were multiple adhesions. Moreover, the anatomy of the abdominal organs was significantly distorted due to the enormous liver [24]. Nevertheless, the intraoperative blood loss was low. Comprehensive management of this patient requires multi-specialty collaboration including transplant nephrology, hepatology, interventional radiology, oncology, hepatobiliary and transplant surgery. For this particular case the involvement of a transplant team certainly may have been beneficial. Maeda *et al*. reported on an emergency pancreaticoduodenectomy for pancreatic metastasis from renal cell carcinoma in a patient with von Hippel-Lindau disease [25]. Also this patient had undergone nephrectomy.

Von Hippel-Lindau disease and polycystic liver/kidney disease both seem to be associated with pancreatic malignancies [26]. Surgical resection remains the cornerstone in the treatment of the pancreatic cancer [1]. This case report illustrates that pancreaticoduodenectomy can be safely performed in patients with polycystic liver and kidney disease. Moreover, this case also highlights the need for comprehensive evaluation of biliary strictures in polycystic disease patients [27, 28]. Advanced understanding of immunosuppression will help to optimize the chemotherapeutic and immunosuppressive agents in the polycystic liver and kidney disease patients with pancreatic cancer.

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