

## Jaundice secondary to bile duct obstruction by polycystic liver disease

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### Abstract

Polycystic liver disease is an autosomal dominant disorder commonly associated with autosomal dominant polycystic kidney disease. It is a rare disease that usually occurs asymptotically in 85% of cases and diagnosis is incidentally. We present the case of 57 years old woman with progressive pruritus and jaundice secondary to stenosis of the common hepatic duct and common bile by liver cyst, rare presentation which only has been documented in case reports: Deepak, et al., Wittig, et al. and Howard, et al.<sup>1-3</sup> (Gac Med Mex. 2016;152:639-42)

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### Introduction

Polycystic liver disease is defined as a clinical entity characterized by the presence of multiple simple cysts occupying at least half the volume of the liver parenchyma<sup>4</sup>.

Three different entities are currently known, including the Von Meyenburg complexes, also known as biliary hamartoma and cystic hamartoma of the liver, isolated polycystic liver disease (PCLD) and autosomal dominant polycystic kidney disease (ADPKD) with renal and hepatic cysts<sup>4</sup>. PCLD has an incidence of < 0.01% of the general population, although its exact prevalence is unclear<sup>5</sup>. Eighty-five percent of patients are asymptomatic and only 5% show signs and symptoms secondary to bile duct obstruction<sup>1,6</sup>. Next, clinical characteristics,

physical examination findings and the study protocol applied to a woman with jaundice secondary to polycystic liver disease-related bile duct obstruction are presented.

### Clinical case presentation

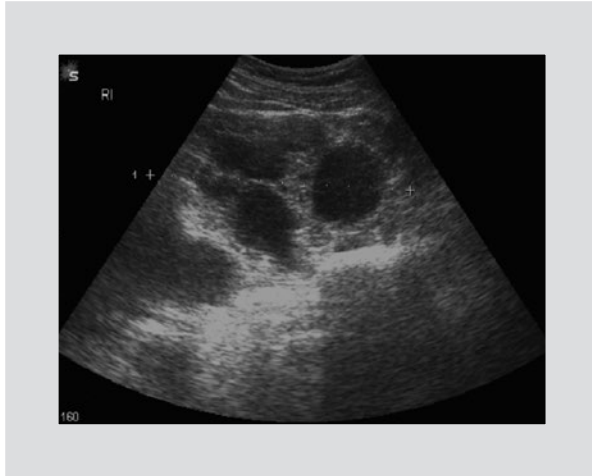
Fifty-seven-year old female patient with a history of a brother with polycystic kidney disease, cholecystectomy for lithiasic cholecystitis at 52 years of age, arterial systemic hypertension since 47 years of age with good control of tensional values, managed with telmisartan/hydrochlorotiazide 40 mg/12.5 mg, and without any other relevant data. Present complaint started with progressive jaundice with 3-week evolution, in addition to generalized pruritus; she denied fever, abdominal pain, asthenia, adynamia or other symptoms. At admission to

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**Figure 1.** Liver ultrasound.

our institution she was found with icteric pigmentation of the skin and integuments. Liver function tests showed a cholestatic pattern, with total bilirubin at 35.30 mg/dl, direct bilirubin at 27.40 mg/dl, indirect bilirubin at 7.80 mg/dl, serum glutamic oxaloacetic transaminase (SGOT) at 55.8 U/l, serum glutamic pyruvic transaminase (SGPT) at 49.2 U/l, gamma glutamyl transpeptidase (GGT) at 123.6 U/l, alkaline phosphatase (ALP) at 679 U/l, lactate dehydrogenase (LDH) 282 U/l, albumin 3.38 g/dl, prothrombin time 30.3 seconds, International Normalized Ratio (INR) 2.63 and creatinine (Cr) at 3.11 mg/dl with filtration rate by the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) method of 15.9 ml/min/1.73 m<sup>2</sup>, as data indicating renal lesion. As part of the cholestatic syndrome protocol, liver and biliary tract ultrasound was performed, where multiple intra-hepatic cysts of different sizes occupying more than 80% of the parenchyma were observed, as well as kidneys with lobulated morphology caused by multiple internally-located cysts (Fig. 1). Subsequently, a simple abdominal tomography was performed (Fig. 2).

The simple abdominal tomography revealed liver parenchyma with heterogeneous density due to the presence of polycystic disease-related multiple intrahepatic cysts and slight intrahepatic bile duct dilatation, kidneys with lobated morphology due to the presence of polycystic disease-related multiple cysts of different sizes within, with more than 80% parenchymal occupation.

Finally, a cholangioresonance (Fig. 3) showed an abrupt reduction of the choledoch duct lumen (Fig. 4).

As a complementary diagnostic and therapeutic measure, an endoscopic cholangiography was carried



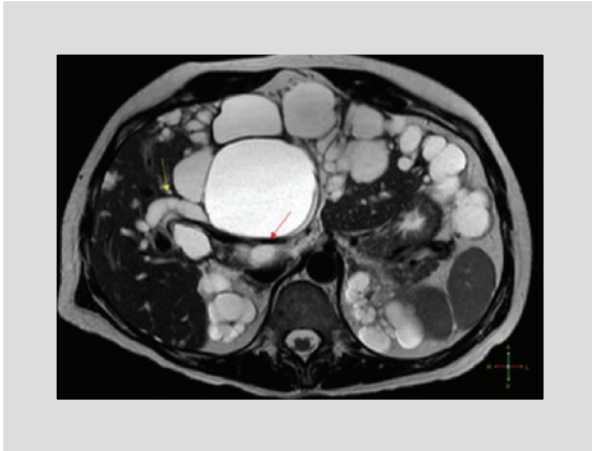
**Figure 2.** Simple abdominal tomography.

out with stenosis dilatation and brush cytology, which reported reactive cylindrical epithelium with no evidence of malignancy; in addition, a plastic biliary endoprosthesis was placed (Fig. 5). Subsequently, the patient was discharged due to improvement of her clinical condition and is currently receiving follow-up as an outpatient with conservative treatment. She has not experienced jaundice and pruritus recurrence, but abdominal distension and early satiety have been added to her condition.

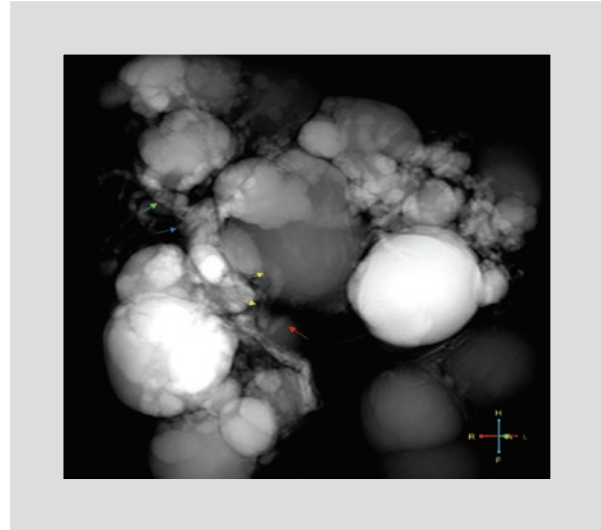
## Discussion

A case of jaundice secondary to polycystic liver disease-related bile duct obstruction is reported. The patient presented with jaundice and progressive pruritus. Within the protocol workup, imaging studies revealed liver parenchyma and kidneys with multiple cysts of different sizes within, with all these findings being related to polycystic disease.

Polycystic liver disease is the result of ductal plate malformation during the development of the biliary tree<sup>7</sup>. In 85% of cases it is due to mutation of the *PKD1* gene, which encodes for the polycystin 1 (PC1) transmembrane



**Figure 3.** Magnetic cholangioresonance. Presence of multiple cystic images diffusely distributed in the liver and both kidneys. The larger cysts exert important extrinsic pressure on the portal vein (red arrow) and the choledoch duct, which causes significant intrahepatic bile duct dilatation (yellow arrow).

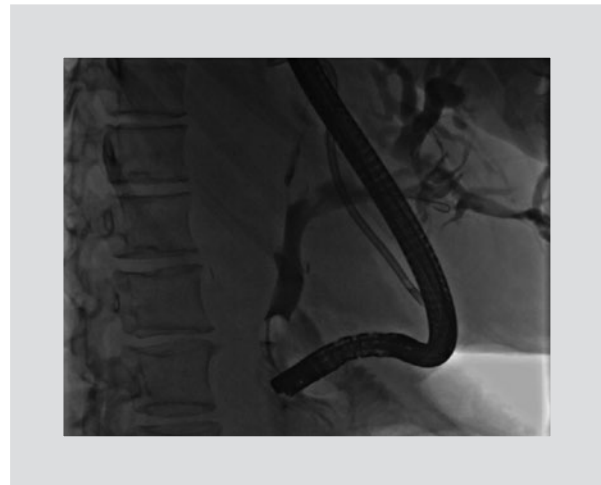


**Figure 4.** Magnetic cholangioresonance: pancreatic duct (red arrow) and distal choledoch duct (yellow arrow) with normal morphology and caliber; common bile duct (blue arrow) and hepatic right duct (green arrow) dilated with beading appearance. Abrupt reduction of the choledoch duct caliber at 6 cm of debouching into the duodenum.

protein; it is associated with cell proliferation and abnormal biliary differentiation<sup>8</sup>. It has been more frequently associated with the female gender, pregnancy, multiparity and exogenous steroid use in females<sup>9</sup>.

Most times, the condition is asymptomatic and the diagnosis is incidentally made, and when symptoms happen to occur, these are mainly associated with hepatic cysts mass effect<sup>6</sup>. In a series of 53 cases with polycystic liver disease reported by Bistriz et al, 71% (n = 38) were associated with polycystic kidney disease, 36.5% (n = 19) with abdominal pain, 9.6% (n = 5) with dyspnea, 9.6% (n = 5) with restricted mobility and 45.1% (n = 23) with hepatomegaly on physical examination<sup>10</sup>.

Other manifestations include early satiety, recurrent ascites and, rarely, inferior vena cava compression with lower limbs edema and obstructive jaundice<sup>11</sup>; however, symptoms usually appear until the sixth decade of life<sup>1</sup>. Jaundice is observed at advanced stages of the disease due to intra- or extrahepatic obstruction of bile ducts by a cyst, as in the case of our patient<sup>12</sup>. In the cases reported by Wittig et al. and Howard et al., bilirubin elevation reached values higher than 19 mg/dl in 30 days<sup>2-3</sup>. In our patient, the diagnosis was directed by the presence of jaundice and the observed cholestatic pattern; per-protocol imaging studies were performed, where an abrupt reduction of the common bile duct was observed, secondary to extrinsic compression by a hepatic cyst. The possibility of a malignant process was considered (cholangiocarcinoma)<sup>13</sup>; however, it was ruled out when endoscopic cholangiography with cytology collection and



**Figure 5.** Endoscopic cholangiography.

endoprosthesis placement was performed. Evolution after the procedure was favorable as symptoms and laboratory values improved, with the patient finally being discharged.

Regarding complications of this pathology, it is important to rule out the presence of simultaneous brain aneurysms, which occur in up to 8%<sup>6</sup>, in addition to mitral valve prolapse; with this being the most common cardiac complication, transthoracic echocardiogram screening is not recommended unless there is cardiac murmur at auscultation on routine physical examination<sup>5</sup>. In our patient, we decided not to perform an

**Table 1. Treatment options for polycystic liver disease**

Non surgical	Medication: Somatostatin analogues mTOR inhibitors* Interventional radiology: Arterial embolization Percutaneous sclerotherapy
Surgical	Fenestration Liver resection and fenestration Liver transplantation

\*mTOR: rapamycin-sensitive complex.

echocardiogram since there was no presence of cardiac murmur on physical examination, and no neuroimaging studies were practiced because she had no neurological clinical manifestations at admission or previous history thereof.

With regard to the treatment of choice, it remains a clinical challenge. Asymptomatic patients require no intervention, whereas for symptomatic patients, there are surgical and non-surgical options (Table 1)<sup>14,15</sup>.

In our patient, fenestration was not decided due to the important amount of parenchymal cysts and, in addition, she would have 27% recurrence due to the presence of cysts larger than 5 cm<sup>6</sup>. Using Schnellendorfer classification has been suggested to differentiate patients who might benefit from liver resection or transplantation, with types A and B referring to non-surgical therapy, type C for patients with severe symptoms, with more than one area of normal liver parenchyma, who would benefit from hepatectomy, and in the case of transplantation, type D, in those with severe symptoms, presence of portal or hepatic vein occlusion and with at least one segment of normal liver parenchyma<sup>5</sup>. Currently, there are new indications for liver transplantation: progressive massive hepatomegaly (arbitrary total hepatic volume: 8-12 liters), intractable liver cysts complications<sup>14</sup>. In the case reported by Clinkscales et al., they performed a percutaneous aspiration of the jaundice-causative cyst, with clinical improvement of

the patient when the bilirubin levels were significantly reduced; with the same result, Wittig et al. and Howard et al. used cyst aspiration and derofing<sup>2,3,16</sup>. In this case, transplantation is feasible and should be regarded as the only curative treatment<sup>17</sup>.

## Conclusion

In conclusion, polycystic liver disease is a rare congenital condition, most cases are asymptomatic, the diagnosis is incidental in most cases and they don't require specific treatment. The association with biliary obstruction is a highly uncommon manifestation that generally requires surgical treatment.

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