

Caroli Syndrome: About a Case Report and a Review of the Literature

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Abstract

Case Report

Caroli's disease is a very rare congenital disorder, characterized by segmental cystic dilatation of the intrahepatic bile ducts. It is called Caroli syndrome when liver fibrosis or cirrhosis coexists, and is often associated with cystic kidney disease including autosomal recessive polycystic kidney disease (ARPKD). We report a case of Caroli syndrome in a 19-year-old patient; under conservative treatment for polycystic kidney disease since the age of 10; revealed by atypical chronic pain of the right hypochondrium and which the diagnosis was made by Magnetic resonance cholangiopancreatography (MRCP) revealing findings compatible with Caroli syndrome.

Keywords: Caroli syndrome, Caroli's disease, Diagnosis, MRCP, Treatment, Polycystic kidney disease.

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INTRODUCTION

Caroli's disease is a congenital, non-obstructive segmental cystic dilatation of the intrahepatic bile ducts. Caroli syndrome being more frequent, often diffuse, is defined as its association with congenital hepatic fibrosis with progression to juvenile portal hypertension [1], and is often associated with cystic kidney disease including autosomal recessive polycystic kidney disease (ARPKD) [2]. First described in 1906 [3] and reported to Caroli since 1958 [4]. They constitute a congenital entity with a probable autosomal recessive transmission [5], by embryological malformation of the ductal plate [6], and they represent a rare cause (<1/1000000 in the general population) of chronic cholestasis and intrahepatic lithiasis in children and young adults [7].

Through this work we report a new case of Caroli Syndrome, in order to describe clinical, diagnostic and therapeutic characteristics, as well as the complications of this rare condition.

CASE REPORT

A 19-year-old patient, under conservative treatment for polycystic kidney disease since the age of 10, was admitted for chronic moderate atypical pain of the right hypochondrium, with no jaundice, gastrointestinal bleeding or fever.

Physical examination found a non-painful abdomen with hepatomegaly and splenomegaly with no

other features of portal hypertension (ascites or venous dilatation of abdominal wall).

Laboratory findings revealed moderate cholestasis associated with thrombocytopenia. Creatinine level was at 13.6 mg/l with a GFR at 90 ml/min /1,73m². Hepatitis B and C serology was negative.

Abdominal ultrasonography and CT scan showed diffuse non-obstructive segmental cystic dilatation of the intrahepatic bile ducts with a hyper vascularized central point (dot sign), as well as vesicular lithiasis, and signs of portal hypertension (homogeneous splenomegaly and collateral spleno-renal circulation). Kidneys were of normal size, with irregular contours, and multiple cortical microcysts with no pyelocaliceal dilatation.

Magnetic resonance cholangiopancreatography (MRCP) also showed diffuse cystic dilatation of the intrahepatic bile ducts, centered on vascular structures, with the other findings of abdominal ultrasonography and CT scan (Figure 1).

Esophagogastroduodenoscopy revealed esophageal and gastric varices. The Fibrosan performed showed advanced Fibrosis with an elasticity estimated at 16 Kpa.

The management was based on the primary prophylaxis of variceal hemorrhage by non-cardio-

selective beta-blockers (Propranolol 20 mg/day), and on symptomatic treatment based on analgesics and

monitoring of vesicular lithiasis. Surgical treatment of the cystic lesions was not possible due to their extent.

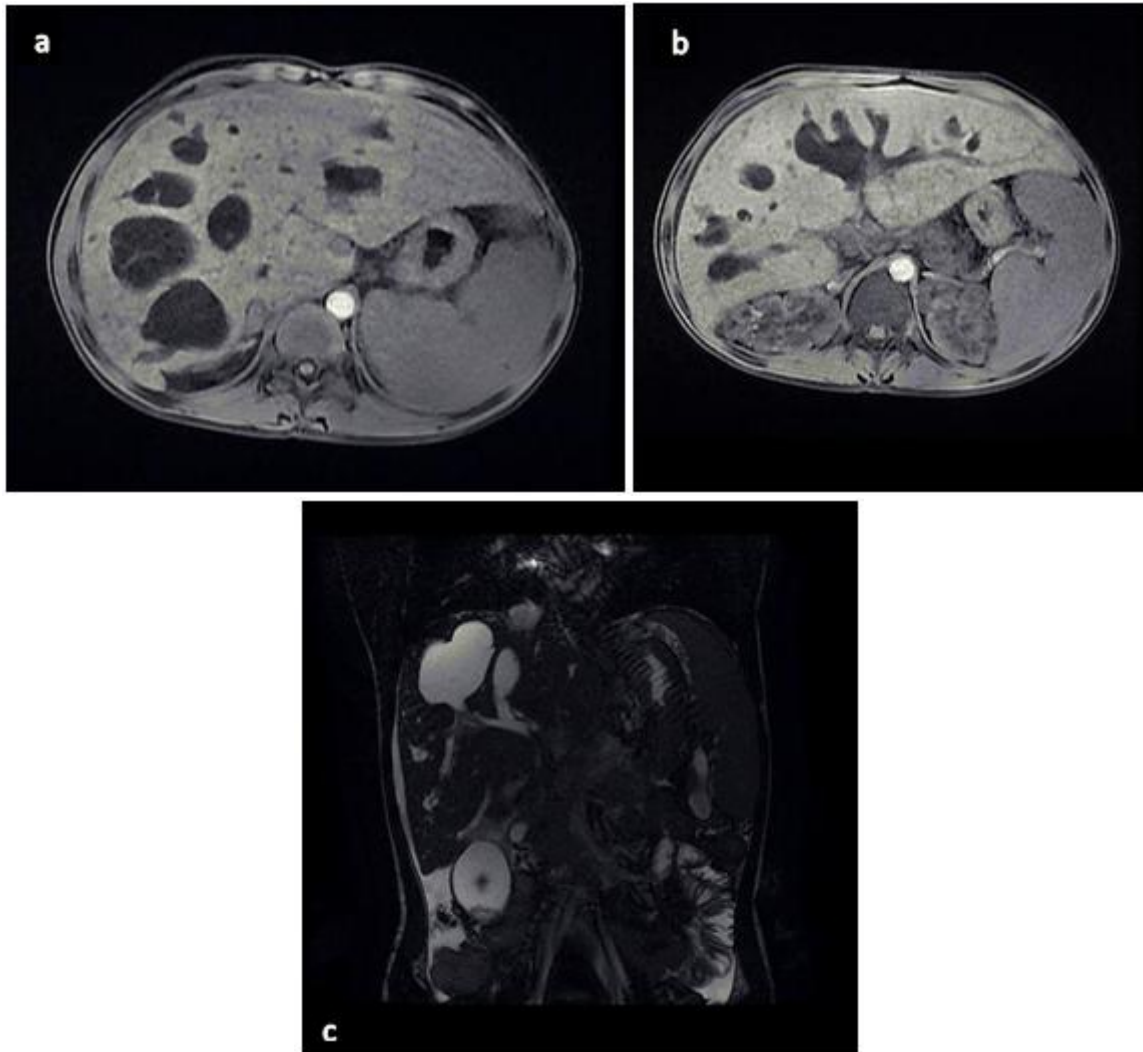


Fig-1: axiale (a,b), and frontal (c) Imaging of MRCP showing diffuse cystic dilatation of the intrahepatic bile ducts

DISCUSSION

Described for the first time in 1906 [3] and reported to Caroli since 1958 [4], Caroli's disease is a rare congenital pathology which is defined by a segmental dilatation of the intrahepatic bile ducts, diffuse or localized to the left lobe [1]. When this anomaly is mostly diffuse and coexists with congenital hepatic fibrosis complicated by cirrhosis or portal hypertension, it is called Caroli syndrome, which is the most common [8].

This syndrome can also be associated with polycystic kidney disease; as in the case of our patient; with tubular renal ectasia, or other forms of cystic diseases of the kidneys and possibly the pancreas [9, 10].

Caroli's disease and Caroli syndrome belong to the spectrum of ductal plate malformations which can

affect all branch stages of the biliary tree [11], and although they occur sporadically, they are considered to be congenital and probably hereditary with autosomal recessive transmission [7]. The mutation of the PKD1 gene is responsible for the association between ductal plate malformation and autosomal recessive polycystic kidney disease during embryogenesis [12, 13].

These congenital anomalies are characterized by clinical latency which is explained by the absence of specific signs of the disease, which leads to the discovery of the disease at the stage of complications such as intrahepatic lithiasis [1].

The clinical symptoms are very variable and nonspecific; we often observe pain in the right hypochondrium, fever, jaundice, episodes of cholangitis or pancreatitis [14]. Sometimes the diagnosis is made during a workup for polycystic kidney disease [15]. In case of hepatic fibrosis or cirrhosis, signs of hepatic

insufficiency and portal hypertension are often present (such as splenomegaly, ascites, peripheral edema, coagulation disorders, and esophageal varices) [16, 17, 23]. To note that the progression of the disease with multiple episodes of cholangitis, the occurrence of abscesses, pancreatitis, and even cholangiocarcinoma, make the management of this disease complex [14].

The diagnosis of Caroli's disease or Caroli Syndrome can be suggested by ultrasonography data showing cystic saccular or spindle-shaped dilatation of the intrahepatic bile ducts converging to the hilum without detectable obstruction [1,7]. It also allows searching for intrahepatic lithiasis with high sensitivity. The most characteristic but inconstant sign is the "dot sign", a small point in the center of the dilatation that corresponds to a vessel [1].

When the diagnosis is strongly suspected on ultrasound, second-line CT scan also shows the cystic dilatations of the central periportal intrahepatic bile ducts as well as cystic dilatations of the common bile duct, the "dot sign", and intrahepatic lithiasis [1].

Magnetic resonance cholangiopancreatography (MRCP) is a non-invasive examination and is currently the gold standard for excellent tissue contrast, thus becoming better than Endoscopic retrograde cholangiopancreatography (ERCP) and Trans-Hepatic Cholangiography despite their high sensibility [1, 6]. It visualizes the entire biliary tree with a better biliary mapping, allowing an evaluation of the severity, distribution and extent of the lesions; it also highlights cystic dilatations as well as the communications of cysts with the bile ducts, the "dot sign", and intrahepatic stones [18].

Histological examination of liver biopsy confirms the diagnosis, search for an associated lesion, such as congenital hepatic fibrosis, and screens for a malignant neoplasia. Despite the specific radiological imaging that allow the diagnosis to be made preoperatively, diagnostic errors have been corrected by histological examination [1]. Patients with Caroli's disease have a risk of developing cholangiocarcinoma 100 times greater than that of the general population with a prevalence of 7% [14, 18].

Treatment of these entities depends on the extent of the lesions [19]. Partial hepatectomy or sectionectomy is offered as the first-line treatment in patients with unilobar form without any recurrent cholangitis, or concurrent liver fibrosis or cirrhosis [14, 17, 20]. In case of diffuse form, biliary drainage by endoscopic, radiological or surgical route is proposed but often associated with high morbidity and mortality due to the infectious complications and a high recurrence rate [14, 17, 21]. Complex bilobar lesions associated with hepatic fibrosis and portal hypertension are an indication for liver transplantation [14, 17].

However, liver transplantation is a real dilemma. Indeed, it does not seem reasonable to expose a healthy subject to complications of liver transplantation and it would be too late to resort to this gesture when the patient is septic [1,22], and therefore the treatment of these cases remains mainly medical by Wide-spectrum antibiotics and sometimes bile solvents, with the usual treatment of portal hypertension [21].

Patients with Caroli's disease or Caroli syndrome usually require close follow-up and regular abdominal ultrasound, blood count measurement, and markers of inflammation and liver function, as well as monitoring signs of portal hypertension and cirrhosis [23]. Long-term prognosis is determined mainly by the frequency and the gravity of the episodes of cholangitis that can lead to sepsis and death or creation of hepatic abscesses [21].

CONCLUSION

Caroli's disease and Caroli syndrome are a rare congenital malformation of the intrahepatic bile ducts and may be associated with conditions affecting other organ systems, such as polycystic kidney disease. After clinical suspicion, the diagnosis is based on MRCP imaging showing the topography of the dilatation, and communication with the bile ducts.

They pose a diagnostic and therapeutic problem given the rarity of the disease, the clinical latency, the absence of specific signs and the frequent association with vesicular lithiasis. Liver resection remains the solution of choice for localized forms, however, for diffuse forms, treatment remains problematic. In fact, apart from liver transplantation, the patients are threatened by septic complications, secondary biliary cirrhosis and malignant degeneration.

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