

Case Report**A Case of Caroli's Syndrome****Anita Basavaraj#, Vipul Chakurkar*, D. B. Kadam******ABSTRACT**

We present a case of young boy with repeated history of ascites, fever and presently hematemesis. Examination and investigations showed hepato-splenomegaly, ascites with bacterial peritonitis, liver cell failure, vitamin deficiency and portal hypertension. Imaging showed cystic lesions in liver and kidney with central dot sign. Liver biopsy had fibrosis along with ductular hyperplasia. Diagnosis of Caroli's Syndrome was made and treated conservatively.

Key Words : Caroli's syndrome, hepato-splenomegaly, central dot sign, liver cysts.

Introduction -

Caroli's disease is characterized by bile ductular ectasia without other hepatic abnormalities while Caroli's syndrome has bile duct dilatation with associated congenital hepatic fibrosis. Transmission is mostly autosomal recessive associated with autosomal recessive polycystic kidney disease (ARPKD). Incidence of Caroli's Syndrome is more than Caroli's disease. We present a case of Caroli's Syndrome in young boy who was treated conservatively.

Case History -

A 16 years old boy presented to us with symmetrical abdominal distension since 15 days. He had fever with chills and dull, diffuse abdominal pain since last 5 days, with hematemesis, 2 episodes in last 3 days. He gave history of repeated episodes of abdominal distension since the age of 3 years and was tapped repeatedly for the same. He received three blood transfusions till date for recurrent anaemia. There was complaint of decreased vision during night hours, as was difficulty gaining height compared to siblings. Other milestones were achieved on time.

He never had slurred speech, involuntary movements or darkening of skin or chronic cough or steatorrhea. His siblings and parents were normal.

On examination, he was febrile, tachycardiac, with BP 100/50mmHg. Pallor was present with bilateral pitting pedal edema. He had white nails but no Icterus. K-F ring was absent on slit lamp examination. Signs of vitamin deficiency like dry skin with phrynoderma, left corneal opacity, Bitot's spots, genu valgum deformity were present. Signs like spider nevi, lack of pubic and axillary hairs, testicular atrophy and dilated veins over the abdomen indicated hepatocellular dysfunction.

Abdominal examination revealed presence of free fluid. He had 4 cm palpable firm and tender liver. Spleen was palpable 4 cm, firm, non tender (**photograph1**). Other systems were within normal limits.

His investigations revealed mild direct hyperbilirubinemia with mildly increased alkaline phosphatase. Transaminases were elevated less than 2 times upper limit of normal. Prothrombin time (PT) was deranged with International normalised ratio (INR) of 1.8. Serum albumin was 2.4gm/dl. Renal functions were normal. His cholesterol and serum calcium were mildly decreased. Hemogram revealed microcytic anemia, leukocytosis and moderate thrombocytopenia. Ascitic fluid examination showed increased proteins, low sugar and polymorphonuclear leukocytosis suggesting spontaneous bacterial peritonitis. Cultures were negative.

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Upper GI endoscopy showed grade 2 varices and portal hypertensive gastropathy (photograph 2). Serum ferritin and serum ceruloplasmin were normal. He was HBsAg and HIV negative. Hb electrophoresis was normal. Chest roentgenogram was normal.

Ultrasound abdomen confirmed hepatosplenomegaly and ascites. Most notable finding was well defined cystic lesions in the both lobes of the liver. Kidneys were of normal size with poor corticomedullary differentiation with punctate cortical calcifications. CT abdomen revealed multiple cystic lesions in liver largest measuring 5 X 4.7cm. The cysts showed communication with intrahepatic bile ducts with traversing vessels within its wall (central dot) (**Photograph 3,4,5**). Similar cysts were noted in kidneys also (**Photograph 4**). MRCP showed large hyperintense cystic lesions in both lobes of liver, with central hyperintense areas, suggests traversing vessel corresponding to central dot seen on CT. CBD and rest of biliary system were normal.

Liver biopsy revealed markedly expanded portal tracts due to proliferated bile ductules and fibrosis that were dilated and showed the stasis of the pigment, surrounded by heavy infiltrates of neutrophils, lymphocytes, plasma cells and histiocytes. Reticulin stain showed increased uptake of dye suggesting fibrosis. These features were consistent with Caroli's syndrome in the background of congenital hepatic fibrosis (**Photograph 6**).

Final diagnosis was made as Caroli's Syndrome (choledochal Cyst Type V) with Hepatic fibrosis leading to decompensated chronic liver disease with portal hypertension and bacterial peritonitis. He was treated conservatively with Vitamin replacements, albumin, antibiotics, diuretics and beta-blockers.

Discussion -

Todani et al classified Choledochal cysts in five types¹. Type V is also called as Caroli's disease, described first by Jacques Caroli, in 1958². It has two variants : Caroli's disease is characterized by bile ductular ectasia without other hepatic abnormalities while Caroli's syndrome has bile duct dilatation with associated congenital hepatic fibrosis^{3,4}.

Transmission is mostly autosomal recessive associated with autosomal recessive polycystic kidney disease (ARPKD). Autosomal dominant transmission is also documented in Japan⁵. The most acceptable theory is ductal plate malformation at different levels of the intrahepatic biliary tree⁶. Normally, ductal plate remodelling leads to formation of normal bile ducts and ductules with subsequent resorption of remaining ductal plate elements. Deranged remodelling leads to persistence of embryonic forms of ductal plate derivatives⁶. This leads to a spectrum of abnormalities ranging from Caroli's disease to hepatic fibrosis. The affected gene is PKHD1 (polycystic kidney and hepatic disease 1). PKHD1 encodes for fibrocystin, a protein of primary cilia sharing structural features with the Hepatocyte Growth Factor (HGF) Receptor. Genetic defects in fibrocystin cause ciliary dysfunction, presently considered a major pathogenic event in cystogenesis⁷.

The estimated incidence is <1 in 1,00,000 population. Incidence of Caroli's Syndrome is more than Caroli's disease. Males are affected as common as females, with 80% of patients presenting before 30 years of age. Presentation is with fever, recurrent cholangitis, chronic liver disease & its complications, hepato-splenomegaly, sometimes renomegaly.

Imaging studies demonstrate bile duct ectasia and irregular, cystic dilation of the large proximal intrahepatic bile ducts with a normal common bile duct. Segmental ductal dilatation is more common than diffuse. Incidence of extra-hepatic duct involvement could be between 21 to 53 %., Cystic spaces in Caroli's are irregular in shape and communicate with billiary tree. Central Dot sign that suggest portal radicles is considered pathognomonic. Complications include recurrent cholangitis, Intra-hepatic cholelithiasis, liver abscess, septicemia and portal hypertension. Cholangiocarcinoma is also known. Treatment is largely supportive with treatment of complications of Portal HTN. Infections should be treated with antibiotics & biliary stone extraction whenever

feasible. Fat soluble vitamins should be supplemented. When the disease is localized to one hepatic lobe, partial hepatectomy relieves symptoms and appears to remove the risk of malignancy. In bilateral disease, hepaticojejunostomy could be considered but liver transplant offers only definite cure.

References :

1. Todani T, Watanabe Y, Narusue M, et al. Congenital bile duct cysts, classification, operative procedures, and review of thirty-seven cases including cancer arising from choledochal cyst. *Am J Surg* 1977, 134 : 263-269.
2. Caroli J, Soupault R, Kossakowski J, Plocker L, et al. La dilatation polykystique congenitale des voies biliaires intrahepatiques: essai de classification. *Sem Hop Paris* 1958; 34; 128-135.
3. A Sood, Vandana Midha, Neena Sood, M Bansal. Caroli's Disease. *JAPI Nov* (54) 2006 : 896-7.
4. Ashish Gupta, Aradhana Gupta, V. K. Bhardwaj, Maya Chansoria. Caroli's Disease. *Ind J Pediatrics*; Mar 2006; 73; 233-5.
5. Tsuchida Y, Sato T, Sanjo K, Etoh T, Hata K, Tera Waki K et al. Evaluation of long term results of caroli disease : 21 years observation of a family with autosomal dominant inheritance and review of the literature. *Hepatosplenomegaly* 1995 (42) : 175-181.
6. Desmet VJ. Congenital diseases of intrahepatic bile ducts : variations on the theme "ductal plate malformation." *Hepatology* 1992; 16: 1069-83.
7. Housset C. Cystic liver diseases : Genetics and cell biology. *Gastroenterol Clin Biol* 2005 Aug-Sep; 29 (8-9) : 861-9.



Photograph 1 : Patient's photograph showing hepatosplenomegaly and ascites.



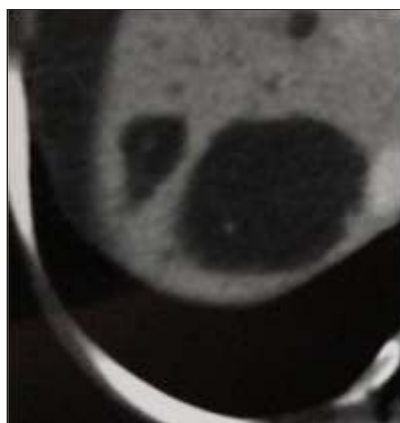
Photograph 2 : Upper GI Scopy showed Portal gastropathy.



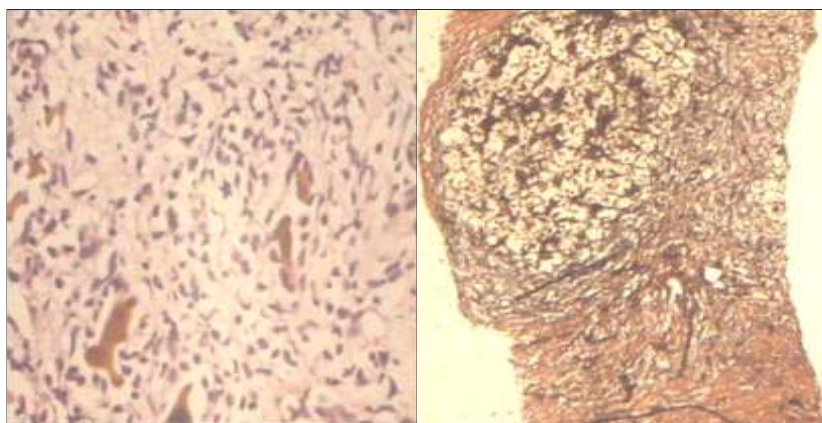
Photograph 3 : CT abdomen shows Cystic lesions in liver with central dot



Photograph 4 : cyst in liver & Kidney on CT Abdomen



Photograph 5 : Central Dot Sign.



Photograph 6 : Liver biopsy shows ductular hyperplasia with inflammation (left) and fibrosis on reticulin stain.