

POLYCYSTIC LIVER DISEASE WITH RIGHT PLEURAL EFFUSION

**Leonardo B, Taufik S, Imelda R, Adlin H, Zulkhairi, Religius P, Elias T, Ilhamd,
Masrul L, Rustam E.Y.S, Juwita S, Mabel S, Lukman H.Z., T.Mira Neny Triana**

Gastroenterohepatology division, Internal Medicine Department
North Sumatera Medical Faculty/ Adam Malik Hospital, Medan

ABSTRACT

Polycystic liver disease (PCLD) is a rare condition in which multiple cysts form in the hepatic parenchyma. Polycystic liver disease is also an autosomal dominant disorder (ADPLD) caused by a mutation in a gene that encodes a protein hepatocystin. Given two genes that are mutated in PCLD PRKCSH genes and gene SEC63. Mutations of these genes can be found less than a third of cases. ^[1,2,5,8]

The disease is rare. PCLD has a prevalence rate of 1: 200,000 people in the American population. PCLD occurs \pm 24% of patients in the third decade of age to 80% by the sixth decade. ^[1,2] Women tend to suffer larger cysts and more and correlated with the number of pregnancies. ^[1,2,3]

PCLD diagnosis is confirmed by ultrasound, CT scan, or MRI. ^[1,2] Polycystic liver disease occurred in 95% of asymptomatic patients. The remaining 5% cause symptoms due to local effects of mass suppression polycystic liver or stretching or compression of the structure of other organs. PCLD treatment is not necessary if the patient is asymptomatic. Cysts were localized resectable, while diffuse to do the transplant.

The following case report of a woman, 48 years old who were treated at the department of H.Adam Malik Medan on 24 November 2012 with a diagnosis of polycystic liver disease with right pleural effusion. Some literature has reported complications of polycystic liver disease, but rarely reported with pleural effusion presentation. Patients already done puncture of pleural fluid and after 3 weeks of treatment patient's condition improved and permitted to be outgoing patient with her own request but never control back again.

Key words : Polycystic Liver Disease, Pleural Effusion

POLYCYSTIC LIVER DISEASE WITH RIGHT PLEURAL EFFUSION

INTRODUCTION

Poly Cystic Liver Disease (PCLD) is a rare condition in which multiple cysts form in the hepatic parenchyma. Polycystic liver disease is also an autosomal dominant disorder (ADPLD) caused by a mutation in a gene that encodes a protein hepatocystin. Given two genes that are mutated in PCLD, PRKCSH genes and gene SEC63. Mutations of these genes can be found less than a third of cases. ^[1,2,5,8]

PCLD has a prevalence rate of 1: 200,000 people in the American population. It occurs in approximately 24% of patients in the third decade of life to 80% in the sixth decade of life, but the kidney disease usually dominates the clinical course. Cysts also may be present in the pancreas, spleen and, less often, other organs. ^[1,2] Women tend to have larger and more numerous cysts, and is commonly identified with increasing age, typically in the fourth or fifth decade of life, number and frequency of pregnancies and severity of renal disease ^[1,2,3]

Diagnose of PCLD is confirmed by ultrasound, CT scan, or MRI. ^[1,2] Polycystic liver disease occurred in 95% of asymptomatic patients. The remaining 5% cause symptoms due to local effects of mass suppression polycystic liver or stretching or compression of the structure of other organs. ^[1-3] There have been several reports in the literature describing the complications of polycystic liver disease, however, presentation with a right pleural effusion has rarely been described. ^[4]

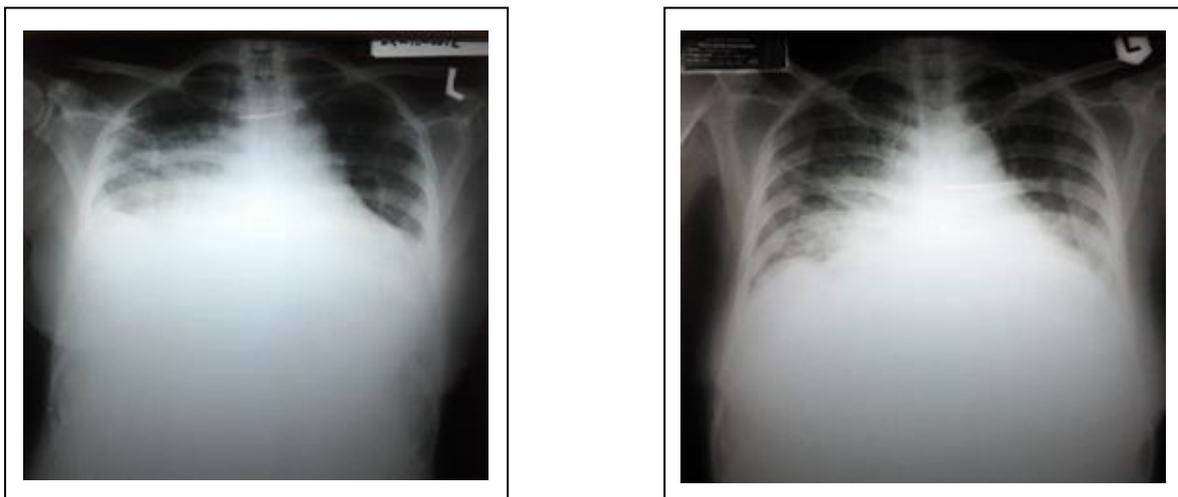
CASE REPORT

Patient is a 48 year old woman, Acehnese, hospitalized in Adam Malik hospital on November 24,2012 with chief complaint shortness of breath within 1 month before. Fever persists for 1 week earlier with coughing and whitish sputum without haemoptoe. Right upper abdominal mass were found since 3 years ago without any symptomatic complains such as abdominal pain, but in latest 1 month, the mass felt even larger. Pale and weakness felt within 1 week before. Spontaneous bleeding were not found. History of hypertension and diabetes mellitus were not found. History of tuberculous medicine were not found. Family history of malignancy or with the same symptoms were not found.

Patient vital sign were compos mentis, blood pressure 120/80 mmHg, pulse 94x/mnt, respiratory rate 28x/mnt, temperature 37,4°C. On physical examination, palpebra conjungtiva inferior were pale, diminished breath sound on right middle-lower lobe pulmonal, infiltrate on right upper lobe pulmonal, liver were palpable on 10 cm lower arcus costae, 10 cm lower processus xypoides, blunted, irregular, without abdominal tenderness.

Laboratory results: Hb 9,8 gr%, Leucocyte 20.660./mm³, Ht 31,8%, Platelet 235.000/mm³. Morphology erythrocyte: normochromic normocytic anemia, Ferritine 483,5 ng/ml, SI 15 mg/dL, TIBC 129 μ g/dl, reticulocyte count 2,46%, LED 100 mm/jam, Ureum 26,10 mg/dL, Cr: 0,56 mg/dL, Total bilirubine 0.55 mg/d L, direct bilirubine 0,39 mg/dL, alkaline phosphatase 241 U/L, AST 14U/L, ALT 12 U/L, γ GT 131 U/L, HbsAg (-), antiHCV (-), Blood sugar 127,5 mg/dL. Electrolyte Na 137 mEq/L, K 4,1 mEq/L, Cl 104 mEq/L, Albumine 2,5 g/dL, Globuline 3,4 g/dL, Blood gas analyses : pH 7,429 , p CO2 34,9, p O2 158,4, HCO3 22,6, Total CO2 23,7, BE -1,4, Sat.O2 99,4 %.

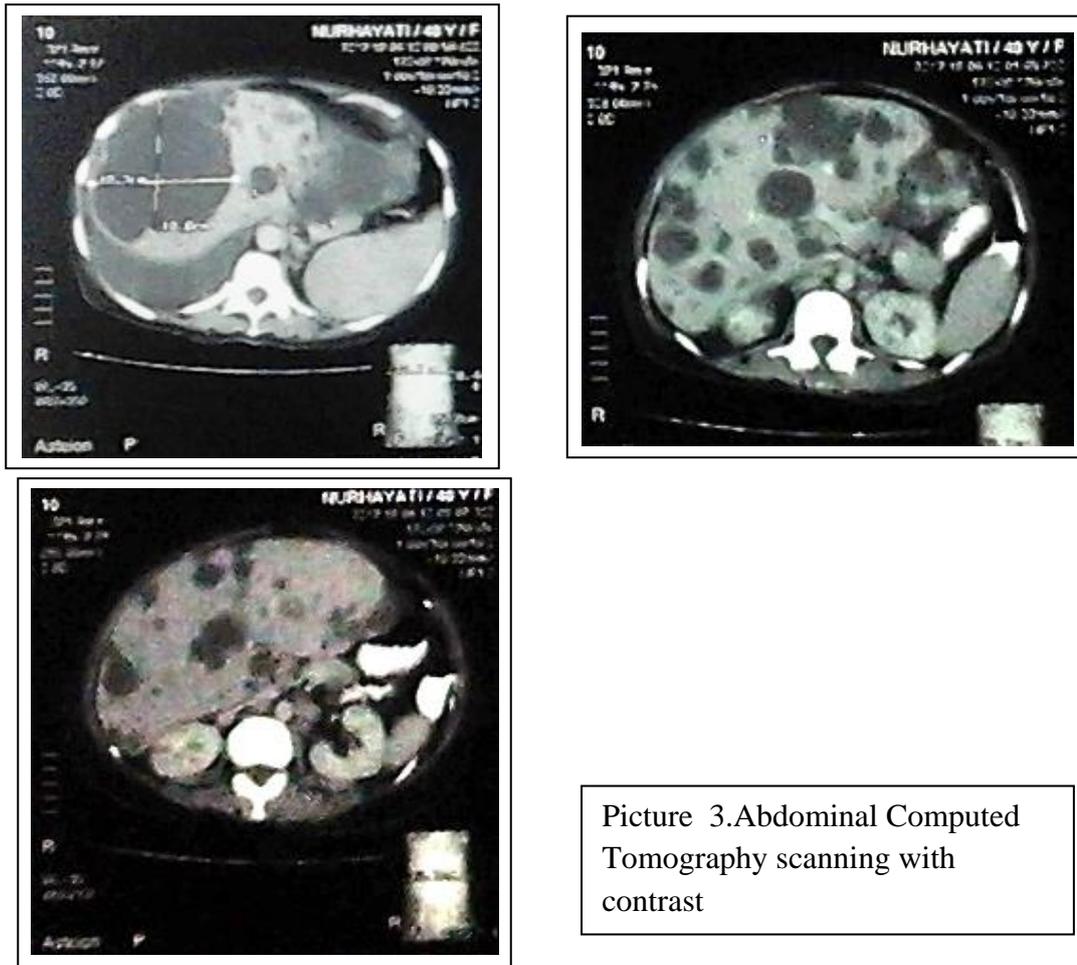
Thorax photo result pneumonia dd specific process with right pleural effusion. BTA DS/3X : -/-/. Abdominal ultrasound result multiple cyst on liver. Abdominal CT Scanning with contrast : multiple cysts on liver, spleen and bilateral kidney with right pleural effusion. Sputum culture: no bacterial growth. Urinary culture : klebsiella sp. >100.000 CFU/ml urine, sensitive with amikasin, meropenem, cefmetazole, piperacilin-tazobactam. Cytology pleural effusion: C3 smear with atypical cells, not confirmative as malignancy. Analysis pleural effusion were exudatif. Culture of pleural effusion : no bacterial growth. BTA pleural effusion : negative.



Picture 1. Thorax photo before and after pleural effusion puncture



Picture 2. Abdominal Ultrasonography



Picture 3. Abdominal Computed Tomography scanning with contrast

Patient were diagnosed with polycystic liver disease + right pleural effusion + pneumonia + urinary tract infection + anemia due to chronic disease.

Treatment including diet 1700 kcal, Oxygen 1 liter/mnt, IVFD NaCl 0,9% 10 gtt/mnt, Inj. Meropenem 1gr/12hour, Ambroxol syrup 3xCI, Parasetamol 3x500mg, pleural effusion puncture 1000 cc. After 3 weeks of treatment patient's condition improved and permitted to be outgoing patient with her own request but never control back again.

DISCUSSION

Poly Cystic Liver Disease (PCLD) is a rare condition in which multiple cysts form in the hepatic parenchyma; usually it comes to clinical attention in adulthood. PCLD usually presents in association with autosomal dominant polycystic kidney disease (ADPKD) but can appear as isolated polycystic liver disease.^[1,2,8] Polycystic liver disease is also an autosomal dominant disorder (ADPLD) caused by a mutation in a gene that encodes a protein hepatocystin. Two genes are known to be related to PCLD. The first gene is *PRKCSH*, which encodes for the β -subunit of glucosidase II, an N-linked glycane processing enzyme in the endoplasmic reticulum. It is located on 19p13.2-p13.1. The second is a *SEC63* gene, which encodes a component of the protein translocation machinery in the endoplasmic

reticulum. It is located on 6q21-q23. These findings suggest a role for co-translational protein-processing pathways in maintaining epithelial luminal structure and implicate (nonciliary) endoplasmic reticulum proteins in PCLD. Mutations in these genes can be found in less than one third of the cases. [5]

PCLD has a prevalence rate of 1: 200,000 people in the American population. It occurs in approximately 24% of patients in the third decade of life to 80% in the sixth decade of life, but the kidney disease usually dominates the clinical course. Adult disease is inherited as an autosomal dominant disorder, and infantile disease as an autosomal recessive disorder. Both result in embryonic hepatic maldevelopment with failed involution of interlobular bile ducts, and associated cysts in other organs such as the kidney, pancreas, lung, and spleen in up to 50% of patients. Women tend to have larger and more numerous cysts, and a correlation with the number of pregnancies has been found. [1,2,3]

Case : a 48 years old woman with 4 children.

Patients are frequently asymptomatic, although large or multiple cysts may result in continuous pain due to stretching, mass effect, or compression of other structures. Nausea from stomach compression and jaundice from bile duct obstruction may develop. There have been several reports in the literature describing the complications of polycystic liver disease due to compression of mass effect of large cyst but thoracic complication such as pleural effusions have rarely been reported as a complication of polycystic liver disease. van Erpecum et al. reported a case of a symptomatic large right-sided pleural effusion complicating polycystic liver disease and requiring intervention, although this was also associated with ascites and attributed to a ‘abdomino-pleural communication. Kerry Woolnough, et.al reported a case of recurrent right pleural effusion associated with polycystic liver requiring surgical intervention. [2,4,9]

Case : chief complaint were shortness of breath and abdominal enlargement due to right pleural effusion et causa polycystic liver disease.

Exudative pleural effusions develop when there is a change in the permeability of local capillaries or the pleural surface. Common causes include malignancy and parapneumonic effusions. Less common triggers include pulmonary infarction, rheumatoid arthritis, autoimmune disorders, asbestosis and pancreatitis. [4,10]

Case : on cytological pleural effusion, not confirmative as malignancy. Sputum and others pleural effusion analyses exclude tuberculosis infection.

The pathogenesis of a right-sided exudative pleural effusion in association with polycystic liver disease remains unclear, with no mechanism described in the literature. Kerry Woolnough, et.al suggested that pleural effusion did not recur after the main hepatic cyst was removed, therefore they postulated that the recurrent right-sided pleural effusion occurred as a direct consequence of the mass effect of the main hepatic cyst displacing and deforming the right hemidiaphragm. This in turn led to a disruption of the local capillary permeability and pleural inflammation, resulting in a persistent exudative effusion. [4,10]

Case : size of cysts and compression effect to adjacent structure organ (diaphragm) as complication of polycystic liver disease caused right pleural effusion. There were no communication defect between peritoneal and pleura cavity on abdominal CT Scan with contrast, thereby excluded a fistel and/or a diaphragm defect or liver rupture, of which exluded as mechanism of pleural effusion associated with polycystic liver disease.

Palpation may suggest normal liver size or massive enlargement. The texture may be nodular and firm due to large cysts (adult polycystic disease) or enlarged, smooth, and firm (infantile polycystic disease).^[2]

Case : on abdominal palpation were found massif hepatomegaly, swollen (unflated), without pain.

Polycystic liver disease has a variable natural history, with the majority of patients seen to remain asymptomatic with normal liver function tests, although serum alkaline phosphatase and GGTP levels may be increased. A raised right hemidiaphragm may be evident on a plain x-ray of the chest in patients with severe PCLD. The diagnosis of PCLD is confirmed by ultrasound, CT, or MRI. The cysts range in diameter from a few millimeters to 10 cm or more. Cysts are lined with biliary-type epithelium and filled with fluid similar to the bile-salt independent fraction of bile. Cysts also may be present in the kidney, pancreas, lung and spleen in up to 50% of patients. ^[1,2,4]

Case : Liver biochemical test results generally were normal, with increased serum alkaline phosphatase and GGTP levels. Renal function test were still normal. Abdominal ultrasound and CT Scan with contrast results multiple cysts in liver, kidney and spleen with varying diameter size from few millimeters to 11cm.

There is no known effective medical therapy. Treatment options depend on symptoms, cyst anatomy, and cyst distribution. When cystic disease is asymptomatic, no therapy is required. If there are only a few cysts near the liver surface, symptoms may be controlled by aspiration, cyst sclerosis by ethanol injection, surgically unroofing the cysts laparoscopically or by open laparotomy, or surgical cystojejunostomy. Localized collections of cysts can be resected, while severe diffuse symptomatic disease has been treated with liver transplantation. Less than 5% of patients have acute medical complications. These consist of cyst haemorrhage, rupture, infection, uterine prolapse due to displacement, obstructive jaundice, portal hypertension, transudative and exsudative ascites and Budd- Chiari syndrome. Treatment should be considered in case of persistent symptoms and complications ^[2,6-9] In a retrospective case series review of 53 patients with polycystic liver disease, Complications requiring intervention in this series of patients were cyst bleeding in 12.5%, cyst rupture in 12.5% and cyst infection in 30%. Portal hypertension was developed by 2.5% of the patients and 5% received a liver transplant. Biliary and inferior vena cava obstruction, chronic abdominal pain and symptomatic abdominal distension are also criteria to offer surgical intervention^[4]

Case : pleural effusion puncture for her symptoms.

The prognosis is excellent in those asymptomatic or when operation or aspiration can easily control cysts. The prognosis also depends in part on the severity of cystic disease in other organs such as the kidney, where renal failure may be a larger risk ^[1,2,3]

Case : renal function test were within normal limits and liver function test were increasing of alkaline phosphatase (241 U/L) and γ GT (131 U/L). Right pleural effusion had been puncture to decrease her symptoms. Patient went home at his own request but never control back again.

SUMMARY

We have reported a case of polycystic liver disease with right pleural effusion based on clinical features, laboratory and radiology examination. Patients already done puncture of pleural fluid and patient went home at his own request but never control back again.

REFERENCES

1. Mark Feldman, Lawrence S. Friedman, Lawrence J. Brandt, Polycystic Liver Disease, Sleisenger and Fordtran's Gastrointestinal and Liver Disease: Pathophysiology/ Diagnosis/ Management, 8th ed., 2006, Vol. 2, Chapter 94, Saunders-Elsevier
2. Friedman, Scott L.; McQuaid, Kenneth R.; Grendell, James H, Polycystic Liver Disease Essentials of Diagnosis, Current Diagnosis & Treatment in Gastroenterology 2nd Edition, McGraw-Hill, 2003, p.809-811
3. Peter R Mc Nally, Liver and Biliary Tract disorder GI Liver secret, 3rd ed Chapter III, p.312-3.
4. Kerry Woolnough, Altav Palejwala and Simon Bramall, Polycystic liver disease presenting with an exudative pleural effusion: a case report, Journal of Medical Case Reports 2012, 6:107
5. A.A. Karimbeg, R.J.L.F. Loffeld, Multiple cysts in the liver autosomal dominant polycystic liver disease, Netherland Journal of Medicine, 2006, Vol.64, No.6, p. 199-201
6. Elesia'rio Marques Caetano-Ju'nior, Marcelo Moura Linhares, De'lcio Matos, MD, PhD, Vladimir Schraibman, Jacques Matone and Sarhan Sidney Saad, Laparoscopic Management of Hepatic Cysts, Surg Laparosc Endosc Percutan Tech, 2006, Vol.16, No.2, p.68-72
7. Guang-Shun Yang, Qi-Gen Li, Jun-Hua Lu, Ning Yang, Hai-Bin Zhang, Xue-Ping Zhou, Combined hepatic resection with fenestration for highly symptomatic polycystic liver disease: A report on seven patients, World J Gastroenterol 2004;10(17):p.2598-2601
8. Desiree E. Morgan, Mark E. Lockhart, Cheri L. Canon, M. Paul Holcombe, J. Stephenson Bynon, Polycystic Liver Disease: Multimodality Imaging for Complications and Transplant Evaluation, RadioGraphics, 2006, Vol.26, No. 6, p.1655-68.
9. Tuan-Jie Li, Hai-Bin Zhang, Jun-Hua Lu, Jun Zhao, Ning Yang, Guang-Shun Yang, Treatment of polycystic liver disease with resection-fenestration and a new classification, World J Gastroenterol, 2008, 14(32): p. 5066-5072
10. F.Hadi Halim, Efusi Pleura dan Penyakit-penyakit dengan efusi pleura, Kompendium Tatalaksana Penyakit Respirasi Kritis Paru, PERPARI, 2012, Jilid I, hal.279-288