Hepatic Hydrothorax in the Patient with Non-Ascitic Liver Cirrhosis: Case Report

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ABSTRACT Hepatic hydrothorax is the fluid accumulation of at least 500 mL in the pleural cavity of a liver cirrhosis patient without the presence of lung or heart disease. Hepatic hydrothorax is a non-frequent complication of portal hypertension, but occurs in 5-12% of all cases of liver cirrhosis patients, and is generally encountered in ascitic cases. Hepatic hydrothorax development is rare in non-ascitic liver cirrhosis in patients who use diuretics. We report a case of a 48-year-old female with non-ascitic liver cirrhosis that to the emergency department complaining of dyspnea, and whom later developed hepatic hydrothorax.

Key Words: Liver cirrhosis; pleural effusion; pleurodesis

ÖZET Hepatik hidrotoraks, akciğer veya kalp hastalığı bulunmaksizin karaciğer sirozlu olan bir hastada pleval boşlukta en az 500 mL sivi toplanması olarak tanımlanmaktadır. Portal hipertansiyonunun sıvı görlümeyen bir komplikasyonu olan hepatik hidrotoraks, olguların %5-12’sinde ortaya çıkmaktadır. Hepatik hidrotoraks genellikle asitli olgularda karşımıza çıkar. Diüretik kullanan asittisiz karaciğer sırıozunda hepatik hidrotoraks gelimiş nadir olarak görülebilir. Biz, neves darlığı şikayet ile acil servisimize başvuran asitsiz karaciğer sırıozlu 48 yaşında hepatik hidrotoraks gelişmiş kadın olguunu sunmak istedik.

Anahtar Kelimeler: Karaciğer siroz; pleval efuzyon; plörodezis

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In the patient’s history, she used oral anti-diabetics for 12 years for diabetes mellitus, and used insulin for 5 years. The patient had an operation 10 years ago for a multi-nodular goiter; however, she did not use any medica-
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The patient’s diagnosis for liver cirrhosis occurred 2.5 years ago. Liver cirrhosis was diagnosed with histopathologic examination of liver biopsy due to abdominal ascit. The patient has not any alcohol her history. Hepatitis markers were negative. The patient was prescribed diuretics for this condition (Furosemide 1 x 40 mg). A coronary angiography was performed 1 year ago with normal results.

The 48-year-old female patient presented at the emergency department complaining of dyspnea, but not of cough, fever, sputum, or palpitations. The patient was tachypneic on physical examination. Oscultation found decreased breaking in the right hemithorax. Posteroanterior chest X-ray (Figure 1) and computerized thorax tomography (Figure 2) revealed right pleural effusion. A complete abdominal ultrasonography revealed no ascites in the abdomen. The findings were compatible with chronic liver disease. Ejection fraction was 60% in the transthoracic echocardiography. We did not detect cardiological pathology, a possible explanation for the pleural effusion.

Routine laboratory tests showed the following: hemoglobin 9.19 g/dL, white blood cell 6.74 K/mm³, albumin 3.5 g/dL, and LDH 218 IU/L. Tests of liver and renal function, and the thyroid-stimulating hormone level were normal. Within the pleural effusion, albumin was 2.1 g/dL, and LDH was 170 IU/L. Cytology of the pleural effusion and a complete urine examination showed no abnormalities. There was no reproduction of pleural fluid in the urine culture. Since we did not detect any cardiac or pulmonary conditions causing the pleural effusion, we diagnosed the case as hepatic hydrothorax.

Pleural effusion was exudative according to Light criteria (0.6). However, we checked the serum-pleural effusion albumin gradient (1.4). It was possible that this was a false exudative result due to prolonged use of diuretics; however, the exudative was evaluated to be compatible with transudate. We drained the fluid by means of pleurocan catheter. We then used rifampicin for and terminated the pleurocan catheter.

**DISCUSSION**

The development of pleural effusion without ascites with liver cirrhosis is a rare clinical situation. Hepatic Hydrothorax is an uncommon manifestation of portal hypertension occurring in approximately 5 to 12% of patients with cirrhosis of the liver. The diagnosis of hepatic hydrothorax is usually suspected in a patient with advanced cirrhosis presenting with a unilateral pleural effusion, most commonly in the right side. Patient usually present with symptoms related to shortness of bre-
ath, cough, hypoxemia and chest discomfort. Ascites is not always present.\textsuperscript{5-7} In addition, pleural effusion is generally encountered on the right side in hepatic hydrothorax, where it was found in our case. Left pleural effusion (16\%) and bilateral pleural effusion (16\%) are rare.\textsuperscript{8,9} Our patient had dyspnea and hypoxemia. There was no fever other signs of infection.

There are many proposed mechanisms for the occurrence of hepatic hydrothorax, including the following: direct passage of peritoneal fluid into the pleural space via diaphragmatic defects, azygous vein hypertension with leakage of plasma, passage of fluid from the peritoneal to the pleural cavities via transdiaphragmatic lymphatics, hypoalbuminemia and decreased colloid osmotic pressure, and thoracic duct lymphatic leakage.\textsuperscript{5,6} But of these mechanisms, the direct passage of peritoneal fluid via diaphragmatic defects appears to explain most but not all cases of hepatic hydrothorax. Hepatic hydrothorax occurs when the accumulation of ascites in the pleural cavity surpasses the absorptive capacity of the pleura. The negative intrathoracic pressure favours the transfer of fluid across these defects and patients usually have minimal or mild ascites.\textsuperscript{10,11} This mechanism has been corroborated with nuclear medicine studies using 99 m Tc-human albumin or 99 m Tc sulphur colloid and dye dye studies that show a unidirectional passage of these markers from the abdominal to the pleural cavity in the first 24 h administration.\textsuperscript{3,6} But we did not use this nuclear medicine technique. The patients pleural effusion cytological and microbiological examination of the biochemical analysis of the malignancy, tuberculosis and other infection wasn’t detected. 2.5 years before liver biopsy of patients were diagnosed with cirrhosis liver. It was hepatic hydrothorax evaluated because of the etiology of pleural effusion not any cardiac and liver problem.

Upon the occurrence of false exudative results arising from the increase in protein content in the fluid, we discussed the use of serum-pleural effusion/ascite gradients method in patients with pleural effusion and ascites who use diuretics. It was evident that the albumin level difference between the serum-pleural effusion and/or ascite fluids are superior to the Light criteria for the differentiation of exudate and transudate.\textsuperscript{12,13} Furthermore, we found the effusion to be exudative according to the Light criteria; however, later it became evident that the effusion qualified as transudate according to the serum-pleural effusion albumin gradient method due to prolonged use of diuretics. This condition prevented further invasive diagnostic procedures for the patient.

Talk, tetracycline, bleomycin are common used agents against to recurrent pleural effusions. But non of them is ideal. Features of ideal agents are cheap, effective, easy found and minimal side effects. Because of it explorations go on to find alternative agent. Kinakin and iodopovidone were showed as alternative agents. But these are not in routinely practice.\textsuperscript{14} Talc, rifampicin and autolog blood were compared in a study which aimed pleurodhesis effectiveness of these agents. Pleurodhesis effect of rifampin was similar with talc. Yilmaz et al used rifampicin, talc, and autolog blood in 56 patients with hydrocell. They affirmed talc as the most effective agent in pleurodhesis.\textsuperscript{15} We got succesful response from our patient who had poor renal functions pleurodhesis with rifampin as alternative agent.

In the medical treatment of hepatic hydrothorax, several methods can be included: thorasynthesis, transjugular intrahepatic portosystemic shunt, videothoracoscopic diaphragmatic defect repair, and tube thoracostomy. However, tube thoracostomy is undesirable due to serious fluid-electrolyte loss.\textsuperscript{15} Thorasynthesis is the first method of preference for the improvement of pulmonary symptoms in cases with hepatic hydrothorax. However, the risk of pneumothorax increases during drainage by thorasynthesis.\textsuperscript{16,17} Furthermore, we believe that subsequent thorasynthesises also further increase the risk of empyema. Therefore, our preferred method for was the insertion of the pleurocan catheter.

CONCLUSION

Our case provided evidence that where the pleural effusion is not associated with cardiac and pulmonary conditions in diuretic-using patients with li-
ver cirrhosis, the preferred course of action for the differentiation of exudative and transudative characteristics of pleural effusion is the use of the serum-pleural effusion gradient method, instead of the Light criteria. This course of action will also protect the patient from. Hepatic hydrothorax should be remembered in hepatic cholestatic patient with pleural effusion and without cardiopulmonary pathology. Differential diagnosis of effusion should be done with microbiologic, biochemical and cytologic tests. Pleurocan as a less invasive operation can used in treatment. We affirmed rifampin as pleurodhesis agent in these selected patients.

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REFERENCES