REFRACTORY HEPATIC HYDROTHORAX WITHOUT ASCITES: A CASE REPORT

Kuan-Chun Lin¹, Gian Lee¹, Chang-Tin Lai¹, Ni-Ko Jao²

Abstract

Hepatic hydrothorax is defined as the presence of significant pleural effusion in a cirrhotic patient without primary pulmonary or cardiac disease. Furthermore, Hepatic hydrothorax in the absence of ascites is a rare complication in decompensated liver cirrhosis. We report a patient with refractory hepatic hydrothorax in the absence of ascites. Successful treatments include medication, pig-tail insertion and video-assisted thoracoscopic surgery (VATS).

Key Words: Hepatic hydrothorax, Ascites, Liver cirrhosis

Introduction

Hepatic hydrothorax is defined as the presence of significant pleural effusion in a cirrhotic patient without primary pulmonary or cardiac disease. Hepatic hydrothorax in the absence of ascites is a rare complication in decompensated liver cirrhosis. Its pathogenesis is still unknown. The incidence of hydrothorax due to liver cirrhosis was 5 to 7%. We report a patient with refractory hepatic hydrothorax in without ascites. Chest radiography showed massive right pleural effusion. The ultrasonography documented the diagnosis of liver cirrhosis without ascites. Successful treatments include medication, pig-tail insertion and VATS.

Case Presentation

A 48-year-old male had presented with intractable dyspnea, orthopnea and cough for months. On physical examination, decrease breath sound and dullness on percussion involving the right lower hemithorax. The liver and spleen were not palpable. There was no shifting dullness also. Normal heart sound and regular heart beat were found. The laboratory data on admission are shown in (Table 1). There was negative hepatitis B surface antigen. Meanwhile, hepatitis C antibody was detected. Chest radiography showed massive right pleural effusion (Fig. 1). Pig-tail was inserted and clear yellowish 2000 ml of fluid was drained immediately. The effusion was transudative. The pleural biopsy and effusion cytology were all negative for malignancy or pulmonary tuberculosis. The daily volume of drained fluid was 1000 ml to 1500 ml. The follow-up CXR revealed no evidence of tumor or pleural lesion (Fig. 2). The abdominal ultrasonography documented the diagnosis of liver cirrhosis, but no ascites or focal hepatic lesion (Fig. 3). Despite of diuretics (spi...
Refractory hepatic hydrothorax

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Fig. 3. Abdominal ultrasonography documented liver cirrhosis, but no ascites or focal hepatic lesion.

Table 1. Laboratory data on admission

<table>
<thead>
<tr>
<th>Biochemistry</th>
<th>Serological test</th>
<th>Peripheral blood</th>
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<tbody>
<tr>
<td>Bil(T) 2.1 mg/dl</td>
<td>HBs Ag (-)</td>
<td>WBC 5890/mm³</td>
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<tr>
<td>Alb 2.5 g/dl</td>
<td>HBs Ab (-)</td>
<td>RBC 390×10⁹/mm³</td>
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<tr>
<td>GOT 83 IU/L</td>
<td>HCV Ab (+)</td>
<td>Hb 11.9 g/dl</td>
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<tr>
<td>GPT 71 IU/L</td>
<td></td>
<td>Plt 6.5×10⁹/mm³</td>
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<tr>
<td>BUN 5.9 mg/dl</td>
<td>Tumor markers</td>
<td>Coagulation test</td>
</tr>
<tr>
<td>Cr 0.9 mg/dl</td>
<td>AFP 11.97 ng/ml</td>
<td>PT 12.6</td>
</tr>
<tr>
<td></td>
<td>CEA 5.2 ng/ml</td>
<td>aPTT 30.3</td>
</tr>
</tbody>
</table>

Fig. 1. Chest X-ray showed massive right pleural effusion.

Fig. 2. Chest X-ray demonstrated no evidence of tumor or pleural lesion.

Fig. 3. Abdominal ultrasonography documented liver cirrhosis, but no ascites or focal hepatic lesion.
rolactone, furosemide) and low salt diet, the daily drained fluid did not seemed decreased. Tracing back his medical history, He received three times of supportive treatments including medications and chest tapping before this admission at other hospitals. Refractory hepatic hydrothorax was impressed. VATS was performed later. Electrocauterization in combination with mechanical abrasion for intraoperative pleurodesis were used. No more fluid drainage following VATS was noted. The pigtail was removed and the patient was discharged uneventfully. Follow-up chest radiography showed no recurrence of the hepatic hydrothorax 3 months later.

**Discussion**

When massive pleural effusion is present, malignancy is the most common etiology. Empyema, congestive heart failure, hemothorax and tuberculosis are the most frequent non-malignant cause. Hepatic hydrothorax is defined as the presence of significant pleural effusion in a cirrhotic patient without primary pulmonary or cardiac disease. The incidence of pleural effusion in patients with cirrhosis is 5-7%. Most reported cases of hepatic hydrothorax have ascites. Talking about the mechanism, the movement of fluid from the peritoneal space into the pleural space could be through congenital or acquired diaphragmatic defects, as well as the diaphragmatic lymphatics, circulation of peritoneal fluid, or oncotic pressure differences between the right and left diaphragms. The diaphragmatic "openings" can be classified into four types. Type 1 is described as no openings, type 2 is small blebs, type 3 is small fenestrations, and type 4 is multiple gaps at the diaphragm. Hepatic hydrothorax without ascites is a rare clinical manifestation. Kirsch et al. proposed the formation of pleural fluid was probably a result of fluid movement from the peritoneal to the pleural space across a diaphragmatic defect before the formation of ascites. This patient belongs to the type 1, no definite openings.

Initial treatments of patients with hepatic hydrothorax include restriction of sodium intake or diuretics. More invasive procedures such as repeated thoracentesis or pig-tail insertion, continuous positive airway pressure (CPAP), transjugular or surgical porto-systemic shunts, pleurodesis or diaphragmatic repair through VATS or thoracotomy, can be considered for patients refractory to conservative treatments (about 10% of these patients). Shunt procedure is relatively contraindicated in patients with severe liver dysfunction (Child C or encephalopathy). Pleurodesis with talc through VATS or chest tube, or combination of both, can be effective, around 50% to 85% of successful rates in patients with hepatic hydrothorax. Because talc is no longer permitted to be used in human body since 2000 in Taiwan, we use pleural electrocauterization for pleurodesis combined with postoperative minocin pleurodesis for some of our patients and can achieve equivalent results. The cauterization is applied most densely on the diaphragmatic surface and lower parietal pleura, and also applied on upper parietal pleura, but with less dense electrocauterization spots. Little mechanical abrasion, instead of electrocauterization, over some areas of mediastinal pleura is used to avoid the risk of massive bleeding from great vessels rupture. This patient received electrocauterization and mechanical abrasion, but no tetracycline injection. Tetracycline intrapleural injection would be administered for additional pleurodesis if large amount (>300ml/d) of pleural fluid drainage persisted over 7 days after VATS.

Finally, the most important thing about the treatment of hepatic hydrothorax is to determine whether they can undergo liver transplantation, which is the only choice of definite therapy for severe cases. The presence of significant hepatic hydrothorax plays an important role for respiratory infections, renal failure and mortality. Especially, treatment failure after VATS pleurodesis is directly related to the severity of liver dysfunction and the degree of portal hypertension, which will influence the rate of ascites accumulation. In conclusion, patients with hepatic hydrothorax can be treated with conservative treatment. Refractory medical hepatic hydrothorax represents a therapeutic challenge. VATS can be an effective
tool compared to transjugular intrahepatic portal systemic shunt (TIPS). Intraoperative pleurodesis with electrocauterization can be an alternative therapy if talc is unavailable.

References

頑固性無腹水之肝性胸水：病例報告

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摘要
治療肝性胸水是臨床上棘手的問題，肝性胸水定義為肝硬化病人出現肋膜積水，且已排除其他會造成積水之心肺疾病。而肝硬化病人出現沒有腹水之肝性胸水更是少見，目前機轉仍不明。我們報告一位以藥物、豬尾巴導管及胸腔鏡手術等方式成功治療頑固性無腹水之肝性胸水的案例。

關鍵詞：肝性胸水，腹水，肝硬化

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