

Extension of Liver Tissue into the Thorax Following a Right Extrapleural Pneumonectomy for Malignant Pleural Mesothelioma

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A 56-year-old male underwent a right extrapleural pneumonectomy for malignant pleural mesothelioma. Two years after the operation, an intrathoracic mass was suspected of recurrence by imaging, however, biopsy revealed that the mass was actively proliferating liver tissues. We discussed this condition in terms of ectopic liver proliferation. (Ann Thorac Cardiovasc Surg 2006; 12: 355–7)

Key words: ectopic liver, malignant pleural mesothelioma, extrapleural pneumonectomy

Introduction

Ectopic liver tissue is rarely reported as an accessory liver, and this tends to occur more often in the abdominal cavity than in the supradiaphragmatic position. Several early reports have shown an ectopic liver to be located in the mesenteries or stalks with a connection to either the liver,^{1,2)} spleen, adrenal glands, pancreas or retroperitoneum with no connection to the main body of the liver.^{3,4)} A supradiaphragmatic ectopic liver is usually disconnected to the main body of the liver.^{5,6)} There has so far only been one case report of an extension of liver tissue in the thorax following injury.⁷⁾

We herein report a case who demonstrated a growing liver in the thorax during a follow-up of malignant pleural mesothelioma, after a right extrapleural pneumonectomy, which was suspected as recurrent.

Case Report

A 56-year-old Japanese male underwent a right extra-

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pleural pneumonectomy in July of 2000 for stage I malignant pleural mesothelioma. The tumor was completely resected with an adequate margin including the total right diaphragm and pericardium. It was reconstructed with a teflon sheet and marlex mesh, respectively. During the operation, the liver was exposed in the thoracic cavity since the peritoneum had been opened. Minor bleeding from the liver was stopped by coagulation with an electric cautery. The patient was followed up as an outpatient after being discharged. Two years after the operation, a computed tomography (CT) to screen for recurrence, demonstrated an intrathoracic mass. This was suspected to be a recurrence when compared with a previous CT image taken 1 year and 6 months after the operation (Figs. 1A and 1B). In May of 2003, a thoracotomy was performed to resect the mass. On entering the thoracic cavity through the 7th rib bed, an ill defined brownish mass (Fig. 2A) was found, and a defect of the teflon sheet, which we had used to reconstruct the right diaphragm during the first operation. A biopsy from the chest wall revealed the presence of almost normal liver tissue demonstrating Glisson's sheath and a central vein (Fig. 2B). However, a high magnification view indicated an active proliferation of hepatocytes with multiple nuclei (Fig. 2C). In an immunohistochemical analysis, proliferating cell nuclear antigen (PCNA) was strongly expressed in the majority of the hepatocytes in the specimen (Fig. 2D), indicating that proliferating potential of the intrathoracic liver. Postoperative ultrasonography and an

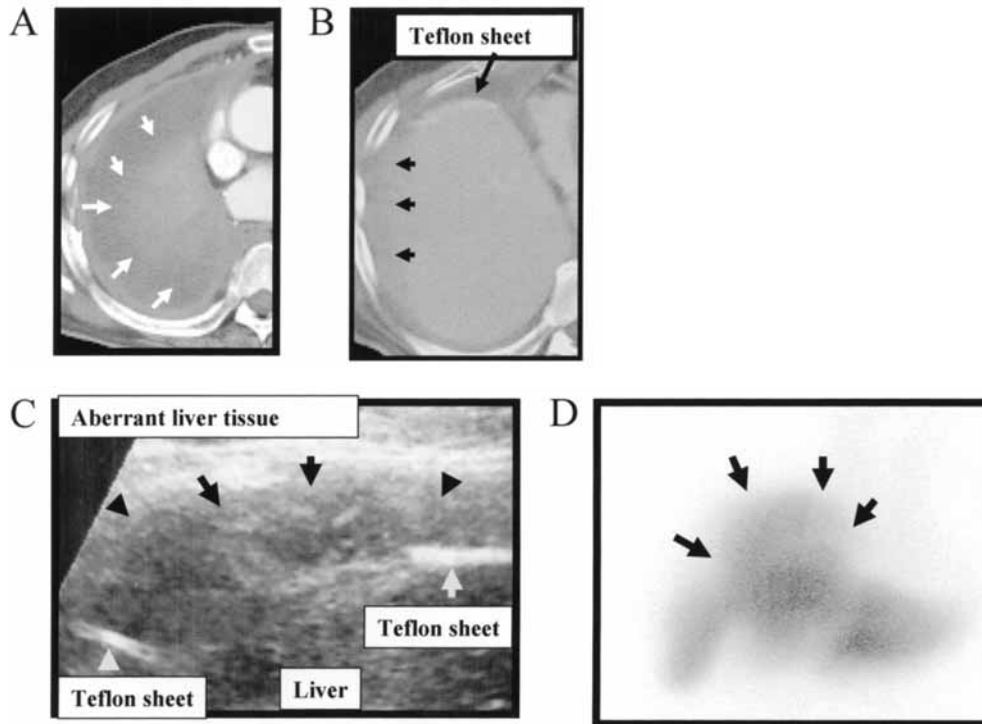


Fig. 1. Imaging findings of the intrathoracic liver.

A, B: Preoperative CT showed the ill-margined liver and a defect in the diaphragm.

C: Postoperative ultrasonography revealed the liver tissue to extend to the right thoracic cavity through a defect in the artificial diaphragm (teflon sheet).

D: ^{99m}Tc-asialoscintigram. The intrathoracic liver, which was a part of the hepatic right lobe, appeared to be demarcated by the reconstructed diaphragm.

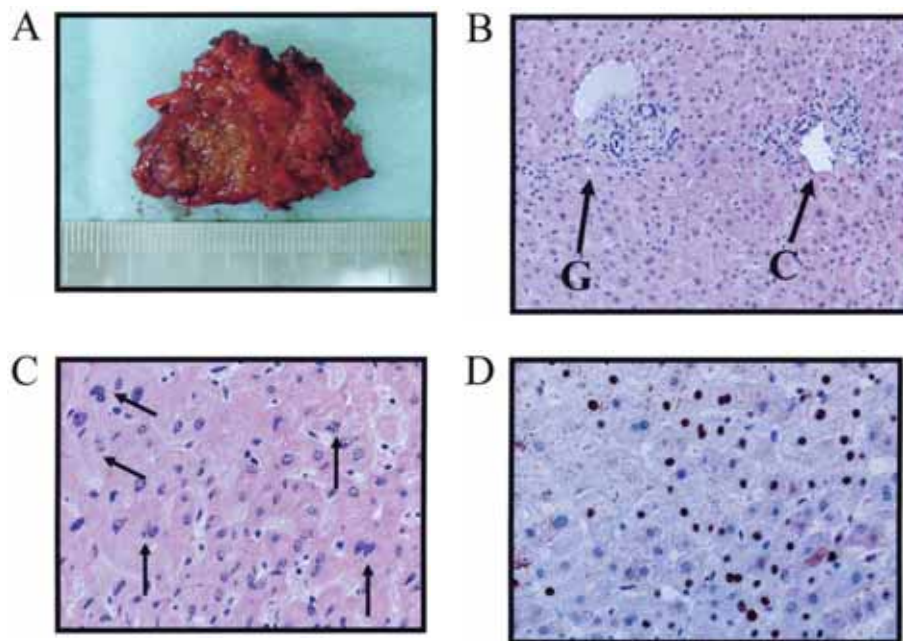


Fig. 2. Findings of the resected specimen.

A: Macroscopic findings.

B: Low magnification view of HE stain (×200).

Normal morphologic appearance such as Glisson's sheath (G) and central vein (C) was observed.

C: Microscopic findings of HE stain (×400).

Five hepatocytes possessing two nuclei (arrows) were observed in the specimen.

D: Immunohistochemical analysis for PCNA of the liver specimen (HE stain: ×400).

Remarkable expression of PCNA was recognized in the majority of hepatocytes in the specimen.

asialo-liver scintigram confirmed an intrathoracic extension of the liver from the right lobe through the defect of the reconstructed diaphragm (Figs. 1C and 1D). The postoperative course was uneventful without any transient increase of transaminases. He was discharged on the 14th operative day.

Discussion

The regenerative potential of liver tissue is well preserved in the non-chirrotic liver.⁸⁾ Following a hepatectomy, the remnant liver usually regenerates well until the dead space in the upper abdomen is occupied. In

this case, the liver grew into the right thorax through the defect of the reconstructed diaphragm. The histological findings exhibited a substantial proliferative potential of the hepatocytes in the resected material, similar to that seen in a regenerative liver. The thoracic dead space after a pneumonectomy usually maintains a negative pressure, and evacuates any aseptic serous effusion and fibrinous materials from the chest wall. It is well known that drainage fluid from a surgical site⁹⁾ or pleural effusion¹⁰⁾ associated with malignancy includes cellular growth factors such as epidermal growth factor or vascular endothelial growth factor. An extrapleural pneumonectomy is a highly invasive procedure, and a thoracic cavity after the operation might remain in an inflammatory state. Such conditions as a dead space, negative pressure and possible growth factors in pleural effusion might lead the aberrant hepatic tissue from the main body of the liver through the defect of the diaphragm.

Despite the unusual findings in our patient, this case reminds us to be aware of the fact the liver can grow in the thorax following a right extrapleural pneumonectomy for malignant pleural mesothelioma.

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