Bilateral Bochdalek Hernias in an Elderly Patient Diagnosed by Magnetic Resonance Imaging

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An elderly patient with asymptomatic bilateral Bochdalek hernias is reported. The chest roentgenogram showed dome-shaped supradiaphragmatic masses about 6 cm in diameter in the posteromedial regions of both sides of the lungs. Computed tomography showed a discontinuity of the lines of diaphragmatic musculature in the left thorax, and a mass with a homogenous low density area indicative of fatty tissues in the right thorax. The magnetic resonance imaging, coronal and sagittal T1-weighted images revealed interruptions of the diaphragmatic musculature adjacent to the masses and protrusion of retroperitoneal fat into the thoracic cavity. The lesions were therefore diagnosed as bilateral Bochdalek hernias of the diaphragm.

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Key words: diaphragmatic hernia, retroperitoneal fat

Introduction

Bochdalek hernia of the diaphragm is considered to be much more common in newborn infants than in adults. However, since the advent of computed tomography (CT), small asymptomatic Bochdalek hernias have been detected with much greater frequency. Here, we report a case of bilateral Bochdalek hernias in an elderly adult. The findings of magnetic resonance imaging (MRI) are considered to be very useful for the definite diagnosis of diaphragmatic mass lesions.

Case Report

An 85-year-old man with a history of hypertension and myocardial infarction was admitted to our hospital for evaluation of chest mass lesions. The first indication of mass shadows on chest X-ray film was in 1982, but he had no symptoms at that time. In February 1989, he had leg edema and mentioned an oppressive sensation in the left flank which lasted for about 1 month and the chest mass lesions were again noted in June. On July 3, 1989 he was referred to our hospital for further examination of the abnormal shadows. Findings at the physical examination on admission were all within normal limits

except for fine crackles in the posteroinferior region of both lungs. Laboratory data showed mild renal dysfunction and a slight obstructive pattern in the spirometry findings (Table 1).

Posteroanterior and lateral views of the chest X-ray films are shown in Fig. 1. Dome-shaped mass lesions (about 6 cm in diameter) abutting the superior surface of the diaphragm were seen in the posterior thorax bilaterally. The size of the mass lesion in the right lung was slightly increased, compared to that seen 7 years earlier. The CT showed a paravertebral round mass with a smooth outline and a homogenous low density area indicative of fatty tissues separated by some linear soft tissue lines in the right vertebral area (Fig. 2, upper), and discontinuity of the diaphragmatic musculature in the left (Fig. 2, lower). These findings suggested the presence of bilateral Bochdalek hernias. To confirm this possibility, we performed an examination employing MRI (Siemens Magnetom, 1.5 Tesla). Figure 3 shows coronal and sagittal views of the thorax on MRI. The coronal and sagittal T1-weighted images revealed discontinuity of the soft tissue lines of the diaphragm adjacent to the masses and protrusion of retroperitoneal fat into the thoracic cavity through diaphragmatic defects. Therefore, the patient was diagnosed to have bilateral

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Table 1. Laboratory Data

Blood cell count		Serum protein	Tumor marker
WBC	6100/ μ l	TP 6.6 g/dl	AFP 3.6 ng/ml
RBC	392×10^4 / μ l	Alb 3.8 g/dl	CEA 3 ng/ml
Hb	13.1 g/dl		
Hct	38.5%	Kidney function	Tuberculin test
		BUN 19 mg/dl	0 $\times$ 0 mm
		Cr 1.4 mg/dl	
Liver function		Ccr 27 ml/min	Spirometry
GOT	18 IU/l	Na 138 mEq/l	%VC 93.3%
GPT	14 IU/l	K 4.1 mEq/l	FEV ₁ % 61.0%
ALP	199 IU/l	Cl 107 mEq/l	
LDH	529 IU/l		
ZTT	16.7 Kunkel		
TTT	6.5 Kunkel		

Urinalysis: normal

Fig. 1. The posteroanterior and lateral views of the chest roentgenograms, showing dome-shaped masses above the diaphragm bilaterally (arrows).

Bochdalek hernias.

Discussion

A patient with bilateral Bochdalek hernias, first noticed by conventional chest roentgenography and later confirmed by MRI, is reported.

Bochdalek hernia, with signs or symptoms related to cardiovascular and respiratory systems, is considered to be much more frequently encountered in newborn infants than in adults. However, recent reports have indicated that the small Bochdalek hernia is not so rare and is frequently identified on routine chest and abdominal CT images even in asymptomatic adults (1, 2). By reviewing the chest and abdominal CT scans of 940 patients, Gale detected 60 Bochdalek hernias in 52 patients; an overall prevalence of 6% which is more than 100 times more frequent than previously reported (1). In addition, the majority of these small Bochdalek hernias in adults are composed of retroperitoneal fat (1–3). The patient presented here is of interest because

relatively large diaphragmatic hernias were seen bilaterally on chest roentgenography and were confirmed by MRI to have definite protrusion of retroperitoneal fat through both sides of the hernias. Moreover, this patient is the oldest case (85 years old) of Bochdalek hernia reported in Japan (4).

CT is a useful modality for evaluating masses at the lung base. Differential diagnoses of fat density masses in the posteromedial area at the lung base include Bochdalek and traumatic hernias of retroperitoneal fat, intrathoracic lipoma, supradiaphragmatic fat, and partial diaphragmatic eventration (1). When the discontinuity of the diaphragmatic musculature is obtained from CT imaging, the diagnosis of diaphragmatic hernia may be readily differentiated from other conditions (1–3). However, direct coronal or sagittal plane is difficult to obtain and the relationships between such a mass and the diaphragm cannot be clearly demonstrated by CT imaging. In contrast, MRI enables one to reconstruct an arbitrary imaging plane and has high contrast resolution in soft tissues. In the present case, sagittal and coronal

Fig. 2. The computed tomographic scans of pulmonary bases. Upper panel shows a low-density mass separated by some linear lines in the right thorax (arrow). Lower panel shows a discontinuity of the diaphragmatic musculature in the left side (arrow).

sections obtained by MRI clearly showed the discontinuity of the diaphragmatic musculature and herniated retroperitoneal fat through diaphragmatic defects. A case of asymptomatic Bochdalek hernia (5), and a case of traumatic diaphragmatic rupture diagnosed by MRI have also been reported (6).

In summary, the coronal and sagittal imagings obtained by MRI can provide more information for the differential diagnosis of paradiaphragmatic mass lesions compared to CT imaging.

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Fig. 3. The magnetic resonance imaging obtained by spin echo (SE) pulse sequences (T1-weighted imaging). Pulse sequences are as follows: repetition time 1100 msec; echo time 15 msec (TR/TE = 1100/15) in the coronal (left) and TR/TE = 990/15 in the sagittal plane (right). Discontinuities of the soft tissue lines of the diaphragm (arrows) and protrusions of fat into the thoracic cavity are seen.