

A bullet in the heart: incremental value of three-dimensional echocardiography

Kalp içinde mermi: Üç boyutlu ekokardiyografinin artan değeri

A foreign body in heart can be diagnosed with simple tests such as chest X-ray or more sophisticated diagnostic methods including computed tomography. Nevertheless, echocardiography is a most commonly used method for the diagnosis. Unfortunately, two-dimensional echocardiography (2D-echo) has some important limitations when a structure with high reflective surface presents in the scanning area. Three-dimensional echocardiography (3D-echo) with its inherent advantage of multiple scanning planes may overcome this problem.

A 26 years old male patient applied to our clinic with a complaint of chest pain. He had had gunshot wound fifteen years ago. He reported that a bullet in his chest left untreated because it had been claimed as not life-threatening at that time. Indeed, left lateral chest X-ray film revealed a bullet in the thorax (Fig. 1). Further performed 2D-echo imaging with a Phillips EnVisior machine was unsatisfactory because of acoustic shadowing (Fig. 2). We tried to show the bullet with aid of 3D-echo (Phillips I33, X3-1 matrix array transducer). Full-volume three-dimensional dataset targeting right ventricle was obtained from modified apical view. Cropping of this dataset from apex yielded an image of the bullet localized within myocardium of right ventricular inferolateral wall (Video 1. See corresponding video/movie images at www.anakarder.com). The patient was advised for surgery but he preferred another center for surgical intervention.

3D-echo has been used in clinical practice especially for ventricular volume and mass measurements. However, artifacts such as acous-



Figure 1. Lateral chest X-ray film showing the bullet



Figure 2. Two-dimensional echocardiographic image with acoustic shadowing (white arrows)

tic shadowing may cause diagnostic problems even in 3D-echo, but out-of-plane image acquisition may aid better localization of object as in our case.

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Dynamic obstruction of inferior vena cava flow caused by right-sided diaphragmatic elevation

Sağ-tarafli diyafram yükselmesinin neden olduğu vena kava inferior akımının dinamik tıkanıklığı

A 74-year-old woman was admitted to our clinic for 3-month history of shortness of breath evolving on exertion. She did not have any cardiovascular risk factors but untreated hypertension. Physical examination and electrocardiogram were normal. The postero-anterior chest X-ray revealed right-sided diaphragmatic elevation (Fig. 1). Subcostal echocardiographic examination showed that the right atrium

(RA) was compressed by the liver. Narrowing of the inferior vena cava (IVC)-RA junction, at deep inspiration was remarkable (Video 1. See corresponding video/movie images at www.anakarder.com). A 72 mm Hg peak gradient emerging at deep inspiration and disappearing at expiration was documented with the pulsed-wave Doppler (Fig.2). Magnetic resonance imaging revealed that the liver was displaced due to the right-sided diaphragmatic elevation and was compressing the IVC and its entrance to RA in a temporal fashion (Fig.3). After excluding the probable underlying causes, the patient was diagnosed to have idiopathic unilateral diaphragmatic paralysis. Interestingly, the dynamic pattern of this obstruction changing with respiration prevented the right sided heart failure symptoms and signs; thus, the patient did not require treatment other than antihypertensive therapy.

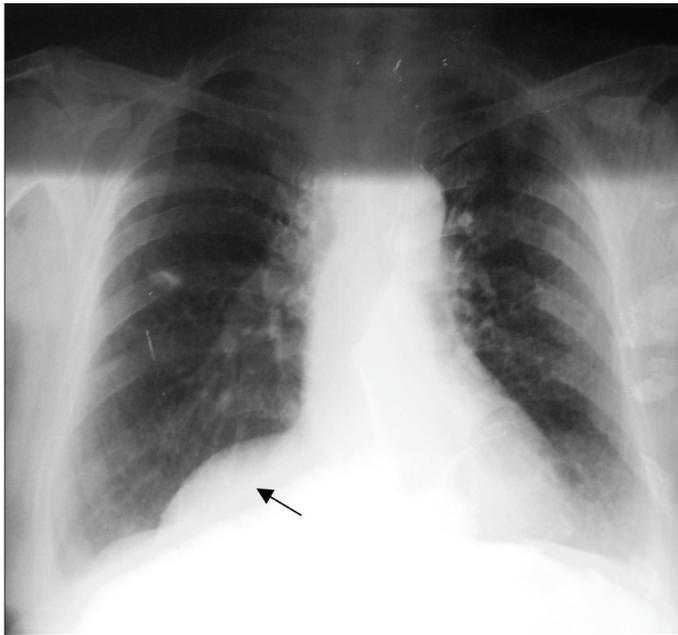


Figure 1. Chest X-ray view of right-sided diaphragmatic elevation

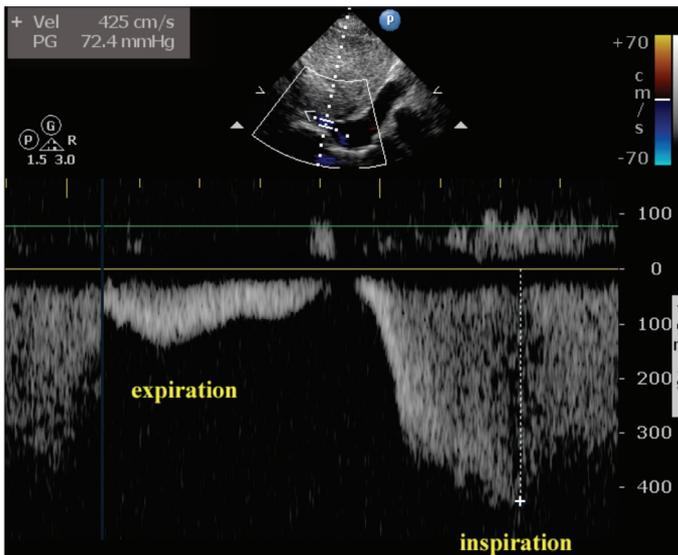


Figure 2. Doppler echocardiography view of dynamic obstruction at deep inspiration with peak pressure gradient of 72 mm Hg gradient and remarkable reduction of pressure gradient at expiration

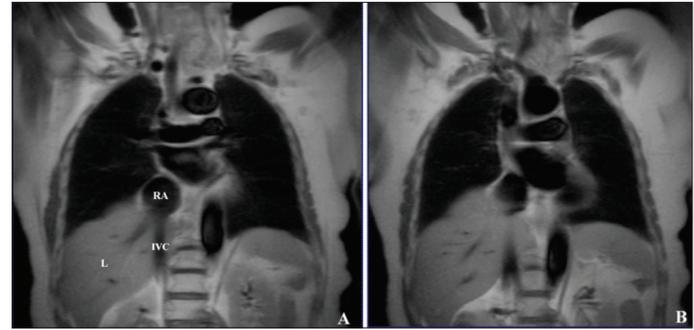


Figure 3. Magnetic resonance imaging coronal views of displaced liver due to the right-sided diaphragmatic elevation, with compression of the IVC and its entrance to RA

IVC - inferior vena cava, L - liver, RA - right atrium

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Intrapericardial paraganglioma

İntraperikardiyal paragangliyom

A 70-year-old woman applied to our hospital with complaints of shortness of breath and fatigue. The laboratory tests and physical examination were insignificant. Contrast enhanced lung computerized tomography was performed after depiction of mediastinal enlargement at the chest X-ray. A large, strongly enhancing mass encasing major vessels arising from the heart and hardly discriminated from the atrium was seen (Fig. 1A). Magnetic resonance (MR) imaging was performed before and after contrast material administration in order to better demonstrate the anatomical origin of the mass and its relationship with the neighboring structures. On MR images, intrapericardially located mass with dimensions of 6x5 cm was detected. The borders were easily discerned from the mediastinal borders. The mass encased proximal portion of ascending aorta and pulmonary trunk anteriorly and displaced aorta to posterior and pulmonary artery to the left. (Fig. 1B-D). After contrast material administration, intense peripheral enhancement and centrally located non-enhancing portion was seen. Surgical resection was planned but only sampling for histopathological diagnosis could be made due to high vascularization and myocardial invasion of the tumor. Histopathological diagnosis was paraganglioma (Fig. 2). An 18F-fluorodeoxyglucose positron emission tomography revealed no other focus. The treatment protocol involved radiotherapy.

Paragangliomas (glomus tumor or chemodectoma) are rare neuro-endocrine tumors arising from chromaffin cells. Pericardial or cardiac paragangliomas are even rare. Some lesions may show unenhancing areas due to hemorrhage or necrosis. The differential diagnosis com-