

Utility of echocardiographic paravertebral approach for detection of endoleaks after thoracic endovascular aortic repair: a case report

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Abstract

We report a case of chronic type B aortic dissection in a 70-year-old man. At an outpatient hospital, he was found to have an expanded dissecting descending aortic aneurysm and was transferred to our hospital for thoracic endovascular aortic repair (TEVAR). A stent graft was successfully placed in the proximal descending thoracic aorta (DTA) to close the primary entry. Postoperative computed tomography (CT) revealed persistent contrast enhancement of the false lumen in the DTA that was suggestive of an endoleak. However, the origin and flow direction of the endoleak were uncertain, and classification of the endoleak was difficult. Hence, the echocardiographic paravertebral approach (PVA) was performed. Both the true lumen and false lumen were clearly visualized and retrograde flow from the intercostal artery into the false lumen was demonstrated by color Doppler examination. These findings suggested that the endoleak originated from the intercostal artery (type II) rather than the proximal end of the stent graft (type Ia). Hence, it was concluded that the patient should be observed conservatively. Follow-up CT at 8 months post-TEVAR showed no expansion of the maximal diameter of the DTA. In this case, the utility of PVA for detection and classification of an endoleak after TEVAR was confirmed.

Keywords

aortic dissection, two-dimensional transthoracic echocardiography, paravertebral approach, thoracic endovascular aortic repair, endoleak

1. Introduction

Thoracic endovascular aortic repair (TEVAR) has been shown to be a valid and minimally invasive treatment for patients with chronic type B aortic dissection complicated with an expanding descending aortic aneurysm¹⁻⁴. Endoleak is the most common complication after TEVAR and is classified into types I to V according to its cause⁵. Accurate detection and classification of an endoleak are needed for appropriate management since it can be associated with aneurysm enlargement and rupture. Thus, repetitive surveillance of stent grafts is necessary to detect an endoleak. Contrast-enhanced computed tomography (CT) is the most widely used modality for surveillance after TEVAR. However, the risk of contrast-induced nephropathy, radiation exposure, and increased costs are limitations of its use as a lifelong surveillance modality. Furthermore, evaluation of the flow direction of an endoleak by contrast-enhanced CT is often difficult.

The echocardiographic paravertebral approach

(PVA), which is radiation-free, non-nephrotoxic, less expensive, and allows real-time flow visualization, is useful for diagnosis of descending thoracic aortic dissection⁶⁻⁸; however, the utility of this approach for detection and classification of an endoleak after TEVAR has not been reported. Here, we report a case in which PVA was useful for detection and classification of an endoleak after TEVAR.

2. Case Report

A 70-year-old man with a history of hypertension and chronic type B aortic dissection with epigastric pain was transferred to our hospital for TEVAR of an expanded dissecting descending aortic aneurysm. He had been diagnosed with acute type B aortic dissection 2 years before, and annual CT follow-ups at an outpatient hospital were planned. Contrast-enhanced CT showed an increase in the maximal diameter of the descending thoracic aorta (DTA), from 44 mm to 50 mm in the past 3 weeks, and a patent false lumen (**Fig. 1**). CT angiography revealed an entry at the proximal DTA. On admission, his blood pressure

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