The Role of Transesophageal Echocardiography in the Acute Onset of Paraplegia

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Background and Purpose: Acute paraplegia must be investigated promptly to exclude reversible causes. In this report we illustrate the usefulness of transesophageal echocardiography in identifying the vascular etiologies of acute paraplegia.

Case Descriptions: Two patients presented with acute paraplegia, one spontaneously and the other after removal of an intra-aortic balloon pump catheter. Through the use of transesophageal echocardiography, we excluded aortic dissection and identified protruding atherosclerotic plaques in the descending thoracic aorta of each patient. Embolization of atheromatous material from the thoracic aorta was considered the most likely etiology of paraplegia in both cases.

Conclusions: Embolization from atherosclerotic plaques in the thoracic aorta may be an underestimated cause of acute paraplegia. Transesophageal echocardiography provides a safe, rapid, and reliable tool for investigating a vascular etiology of acute paraplegia. (Stroke 1992;23:1660-1661)

KEY WORDS • cerebrovascular disorders • echocardiography • embolism • paraplegia

The causes of acute paraplegia include malignant metastases to the spinal cord, trauma, aortic dissection, and spinal artery occlusion from thrombosis and embolism. Identification of the etiologic mechanism of acute paraplegia is not difficult when dealing with trauma or malignancies; for example, a magnetic resonance imaging (MRI) scan can quickly identify a compressive lesion. However, identifying a vascular etiology can be more challenging. Angiography has been the standard diagnostic test when a vascular cause, especially an aortic dissection, is suspected. However, less-invasive techniques such as transesophageal echocardiography (TEE) have been shown to be as reliable as angiography. In this report, we describe two patients with acute paraplegia in whom TEE was useful for demonstrating the probable etiology for the acute paraplegia.

Case Reports

Case 1

A 77-year-old woman with a history of hypertension and coronary artery disease was admitted to a local hospital with sudden onset of epigastric pain radiating to her back, followed by paraplegia. Aortic dissection was suspected, and an emergency computed tomographic (CT) scan was performed and interpreted as normal. Upon transfer to our institution, her neurological examination was significant for sensory deficits at the T12 level on the left and at the T4 level on the right, with areflexia and marked motor weakness of her lower extremities.

The patient underwent emergency aortography that showed a normal aorta, without evidence of aneurysm or dissection. A TEE was performed to investigate a cardiac source of embolism. TEE demonstrated no intracardiac thrombus or evidence of aortic dissection, but it did reveal extensive, protruding atherosclerotic plaques in the aortic arch and descending thoracic aorta. An MRI of the spine performed approximately 1 week after admission revealed infarction in the spinal cord from T6 through T9. The patient had some recovery of neurological function and was transferred to a rehabilitation facility for further care.

Case 2

A 70-year-old woman with a history of diabetes mellitus, peripheral vascular disease, hypertension, and coronary artery disease was transferred to our institution with unstable angina. Emergency cardiac catheterization revealed severe three-vessel coronary artery disease, with mild-to-moderate left ventricular dysfunction. During the procedure, the patient developed chest pain refractory to medical management, and an intra-aortic balloon pump catheter was placed percutaneously through the right femoral artery. The patient underwent emergency coronary artery bypass surgery.

The intra-aortic balloon pump catheter was removed postoperatively, 27 hours after its insertion. Several hours later, the patient was found to have flaccid, areflexic lower extremities, with a sensory deficit extending caudally from the level of the 4th thoracic vertebrae, and incontinence of bowel and bladder. A TEE was performed to investigate the possibility of an aortic dissection; it demonstrated extensive mobile, protruding atherosclerotic plaques in the descending thoracic aorta, with no evidence of dissection (Figure 1).
The patient's hospital course was prolonged and involved multiple complications, including acute renal failure requiring dialysis and respiratory difficulties that contributed to her death 3 months after surgery. An autopsy request was denied.

Discussion

Aortic dissection presents as acute paraplegia in 2-8% of patients. TEE diagnosis of dissection is made by identifying a consistent linear echo representing an intimal flap, both true and false lumens, and most often a communication between the true and false lumens by Doppler techniques. Compared with CT scanning and angiography, transesophageal echocardiography has increased sensitivity and specificity for the diagnosis of aortic dissection. In both of our reported cases, TEE was able to exclude the diagnosis of aortic dissection with certainty.

Embolization from atherosclerotic plaques within the thoracic aorta has been considered a rare cause of acute paraplegia. Wolman and Bradshaw have reported two cases of paraparesis from spinal artery emboli. The plausible explanation for this reduced incidence of spinal artery embolization in the presence of extensive aortic atherosclerosis is probably the lack of meticulous attention to the spinal cord during autopsies.

Protruding atherosclerotic plaques are common in the thoracic aortas of older patients with atherosclerosis. TEE has been shown to be an excellent tool for detecting protruding atherosclerotic plaques in the thoracic aorta; when detected, the risk of stroke or peripheral embolism is high. Karalis and colleagues found a 31% incidence of embolism in patients with protruding atherosclerotic plaques detected by TEE in the thoracic aorta. Furthermore, patients with protruding atherosclerotic plaques are at increased risk for embolic events during invasive procedures (e.g., femoral artery catheterization, intra-aortic balloon pump) involving the aorta compared with patients with minimal or no aortic atherosclerosis. When acute paraplegia occurs during or after an invasive procedure involving the aorta, TEE provides a means for detecting aortic dissection or protruding atherosclerotic plaques in the aorta, the two most likely etiologies in this setting.

The two cases presented in this report illustrate the usefulness of TEE in the initial management of patients with acute paraplegia of suspected vascular etiology. TEE can be performed quickly at the bedside and is associated with only minimal discomfort. If TEE is performed as the initial diagnostic procedure in patients suspected of having aortic dissection, the risks related to invasive diagnostic angiography, especially potential embolization from physical dislodgement of atheromatous plaques in the aorta, administration of contrast dye, and radiation exposure are avoided. TEE also offers the advantage of visualization of the intimal surface of the aortic wall, not feasible with CT scan, MRI, or aortography. This allows recognition of protruding atherosclerotic plaques and thrombi, both of which can embolize and cause paraplegia. As the use of TEE in this clinical setting increases, we may find that protruding atheromatous plaques in the thoracic aorta are an underrecognized etiology of acute paraplegia.

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References
