Peripheral Arterial Embolism Due to a Left Ventricular Diverticulum in a Young Adult*

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A 32-year-old man was admitted to the emergency department of our hospital after experiencing a peripheral arterial embolism. Investigation of the possible embolic sources in an otherwise asymptomatic patient revealed the existence of a left ventricular diverticulum. The left ventricular diverticulum is a rare congenital anomaly, either isolated or as a part of a syndrome including other congenital malformations. The treatment of choice, especially in symptomatic patients, is surgical resection, while in asymptomatic patients anticoagulation therapy is indicated.

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Key words: arterial embolism; left ventricular diverticulum

Left ventricular diverticula are very rare congenital anomalies, first described in 1838, and may be either isolated or associated with other cardiac and extracardiac defects. Surgical resection is usually proposed in diverticula, which, though frequently asymptomatic, are accompanied by potentially lethal complications. We present the case of a 32-year-old man with a left contractile ventricular diverticulum originating from the left ventricular apex.

CASE REPORT

The patient was referred to the emergency department of our hospital because of an episode of acute pain in his left lower limb that had begun 2 h before. He had no history of cardiovascular disease. On physical examination, his heart rate was 120 beats/min, and his BP was 130/80 mm Hg. Cardiac sounds revealed no murmurs, and pulmonary auscultation findings were normal. The ECG showed sinus rhythm with high-voltage R waves and a T-wave inversion in leads II, III, avF, and V4-V6. The chest radiograph revealed no abnormalities. A careful examination of his left lower limb found it to be pulseless, with cool, pale skin, and delayed capillary filling. The peripheral pulse in the limb was inaudible to a hand-held Doppler device. IV heparin was administered immediately, and the patient was taken to surgery. He underwent a successful surgical thromboembolectomy from the left femoral artery, and his remaining hospitalization was uncomplicated. During the investigation for a possible embolic source, transthoracic echocardiography was performed, and it revealed a cavity at the left ventricular apex having free communication with the main left ventricular chamber (Fig 1, top A). The transesophageal echocardiogram clearly showed that this second cavity contracted simultaneously with the left ventricle, while no obvious thrombi were detected in the left atrium, left ventricle, or second cavity (Fig 1, bottom B). Left cardiac catheterization revealed normal coronary arteries, and left-sided ventriculography confirmed a cavity contracting simultaneously with the left ventricle (Fig 2). Tc-sestamibi scintigraphic imaging showed that this second cavity had normal perfusion, and the diagnosis of left ventricular diverticulum was confirmed. Although surgical resection of the diverticulum was proposed, the patient refused. He was discharged from the hospital while receiving anticoagulation therapy.

Discussion

Diverticula make up part of the broader class of subdviisions of the left ventricular cavity, which also includes aneurysms and the double-chambered left ventricle. The most frequently described classification of diverticula is into the muscular and fibrous types. The fibrous type is noncontractile and originates from the base of the left ventricle, while muscular diverticula usually arise from the left ventricular apex with a narrow neck and include all anomalies, first described in 1838, and may be either isolated or associated with other cardiac and extracardiac defects. Surgical resection is usually proposed in diverticula, which, though frequently asymptomatic, are accompanied by potentially lethal complications. We present the case of a 32-year-old man with a left contractile ventricular diverticulum originating from the left ventricular apex.
three cardiac layers. In contrast, cardiac aneurysms have a broad neck and are usually febrile. Diverticula are usually part of a syndrome that also includes other congenital defects involving the abdominal wall, sternum, diaphragm, pericardium, and heart, as first described by Cantrell et al in 1958. Isolated left ventricular diverticula are found in 30% of cases and are usually seen in children, probably as a defect in embryonic development that is discovered coincidentally.

In adults, an isolated diverticulum of a muscular type is very rare, and relatively few cases have been described in the literature. The etiology of this malformation is unknown. It is probable that a maldevelopment of the myocardial intratrabecular sinusoids is the primary underlying anomaly and that hemodynamic factors may be contributory in some cases. Other reports have mentioned diverticula that are associated with a history of hypertrophic cardiomyopathy, probably representing the end stage of a localized disease due to hemodynamic factors. Diverticula are associated with numerous serious complications, such as cardiac arrhythmias, sudden death, endocarditis, systemic emboli, heart failure, cardiac rupture, and intraventricular obstruction. Surgical resection is the treatment of choice in symptomatic patients, in order to prevent all these potentially lethal complications. The management of asymptomatic patients with diverticula often represents a therapeutic dilemma. While most specialists advocate resection, others recommend a conservative approach. In our case, left femoral embolism was the first clinical presentation of a left ventricular diverticulum in an otherwise asymptomatic young man. The findings of laboratory tests and imaging studies showed no other potential sources of the emboli.

**CONCLUSION**

Our patient was absolutely asymptomatic, and the diverticulum was only discovered after a life-threatening complication. This case strongly reinforces the view that, although controversial, surgical management of asymptomatic patients could be considered with a view to avoiding future serious complications. If surgical resection is not performed, anticoagulation therapy becomes obligatory.
Exercise Testing in Wolff-Parkinson-White Syndrome*

Case Report With ECG and Literature Review

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ECG changes during exercise stress testing, such as false-positive ST-segment depression and disappearance of the delta wave, are reported in patients with the Wolff-Parkinson-White (WPW) pattern. We present a case of exercise testing in a 53-year-old man with WPW syndrome with ischemic-appearing ECG changes and normal nuclear stress perfusion study findings who was thought to be at clinically low risk for having significant coronary disease. A literature review is discussed. Although ST-segment depression typical for ischemia occurs in half of the patients in whom WPW syndrome is reported, exercise testing is still an important tool in their evaluation. Data other than ECG response can be interpreted in the context of clinical history and physical examination findings to stratify the risk of coronary disease. Complete and sudden disappearance of the delta wave has been seen during exercise in 20% of patients with WPW syndrome and can identify those who are at low risk for sudden arrhythmic death.

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Key words: exercise test; preexcitation syndromes; Wolff-Parkinson-White syndrome

Abbreviations: EP = electrophysiology; WPW = Wolff-Parkinson-White

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