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Case Report

A pediatric case of hypertrophic cardiomyopathy with mid-ventricular obstruction incidentally detected by electrocardiography

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Pathology

Summary A 13-year-old girl was admitted to our hospital because mitral P wave and ST depression in leads II, III, aVF, and V3-6 were incidentally detected on electrocardiography at a school health examination. Although she had noted no cardiac symptoms during club volley ball games, the treadmill exercise test induced chest discomfort in the absence of obvious electrocardiographic changes. B-type natriuretic peptide was elevated at 685 pg/ml. Echocardiography revealed left mid-ventricular hypertrophy and obstruction, sparing of the apical ventricle at end-systole, and severe left atrial dilatation. Continuous-wave Doppler echocardiography clarified a peak pressure gradient of about 40 mmHg between the apical and basal sites of the left ventricle. Swan-Ganz catheterization suggested elevated atrial pressure and left ventricular end-diastolic pressure. Left ventriculography showed an ''hourglass'' appearance. Endomyocardial biopsy revealed cardiac muscle cell disarray. We diagnosed a rare pediatric case of hypertrophic cardiomyopathy with mid-ventricular obstruction. This case reconfirms that electrocardiography during school health examinations is a very important screening tool for the detection of asymptomatic or mild symptomatic cardiac diseases.

Introduction

Hypertrophic cardiomyopathy (HCM) is a genetic disorder characterized by primary myocardial hypertrophy. HCM occurs in about 0.2% of the general population and is the most common and important cause of sudden death in children and young adults [1]. Mid-ventricular obstruction (MVO) is a rare subtype of HCM characterized by the presence of a pressure gradient between the basal and apical sites in the left ventricle. This obstruction is generated by mid-ventricular myocardial hypertrophy or anomalous insertion of papillary muscles [2]. MVO-HCM has been occasionally

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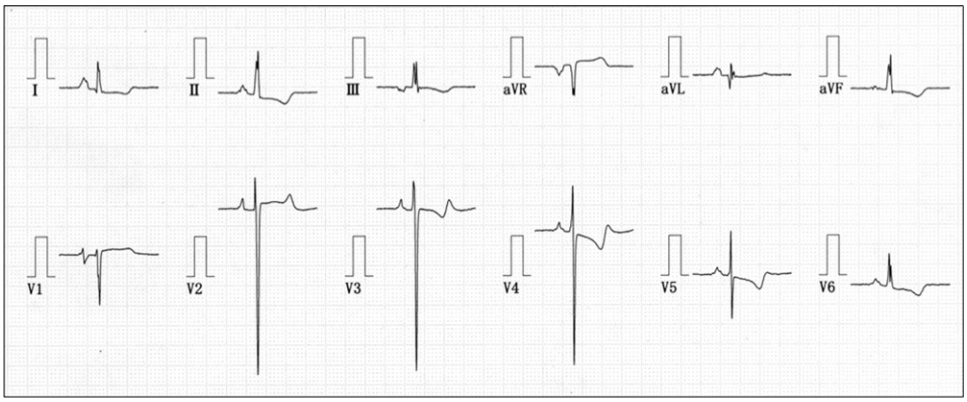

Figure 1 Electrocardiogram showing mitral P wave and ST depression in leads II, III, aVF, and V3-6.

reported in adults but rarely in children. Moreover, many MVO-HCM patients do not come to medical attention until they develop cardiac symptoms such as chest pain, dyspnea, palpitation, faintness, or syncope. We present a rare pediatric case of MVO-HCM incidentally detected by electrocardiography at a school health examination.

Case report

A 13-year-old girl was admitted to our hospital because of abnormal findings first discovered on an electrocardiogram (ECG) recorded at a school health examination. She had no significant past medical history such as rheumatic fever or Kawasaki disease. Furthermore, her family history was negative for heart disease, sudden death, and premature death. She noted no cardiac symptoms such as chest pain, dyspnea, palpitation, faintness, or syncope. Although she was not an athlete, she enjoyed playing volleyball after school for 2—3 h, 3 times a week. Her pulse rate was 76 beats/min in a regular rhythm, and the blood pressure was 102/54 mmHg. Cardiac auscultation showed no obvious murmur or gallop, and pulmonary auscultation showed normal respiratory sounds and no rales. External malformations, skeleton abnormalities, and the characteristic skin mani-

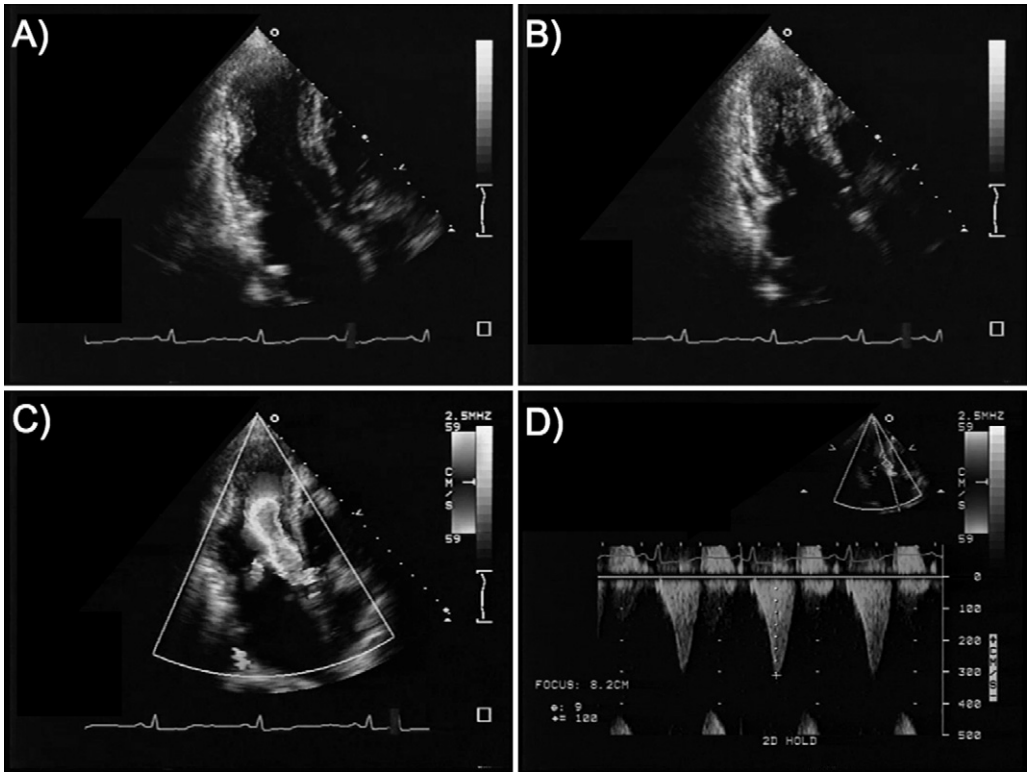

Figure 2 Echocardiogram images at diastole (A) and systole (B), showing left mid-ventricular hypertrophy and obstruction, and sparing of the apical ventricle during systole. Color Doppler echocardiogram image (C) showing the jet flow near the mid-ventricular hypertrophied myocardium. Continuous-wave Doppler echocardiogram image (D) showing a peak pressure gradient of about 40 mmHg between the apical and basal sites of the left ventricle.