Dissecting aortic aneurysm diagnosed by echocardiography

A pre- and postoperative study

P. Yuste, V. Aza, I. Minguez, L. Cerezo, and C. Martinez-Bordiu
From 'Servicio Nacional de Cirugia Toracica', Ciudad Sanitaria 'La Paz', Madrid, Spain

An echocardiographic study was performed in a 38-year-old man with a dissecting aortic aneurysm diagnosed clinically and by cardiac catheterization.

The echocardiograms showed normal aortic leaflets within two anterior and two posterior echoes indicating an abnormally dilated aortic root and the false lumen of the aneurysm.

After surgical repair the echocardiographic study showed a normal aortic root echogram without any false lumen in the aortic walls.

This technique may therefore be useful in the noninvasive diagnosis of this condition.

Although descriptions of the echoes originating from the aortic root and the aortic leaflets have been published (Feigenbaum, 1972; Feigenbaum and Chang, 1972; Gramiak and Shah, 1968, 1970), there have been few clinical applications of these observations apart from the evaluation of aortic stenosis and the presence of aortic calcification. The echocardiographic study of the aortic root might however be expected to be useful in the diagnosis of dissecting aneurysm of the aorta (Millward, Robinson, and Craigie, 1972): the patient to be described was a young man with a dissecting aneurysm of the ascending aorta diagnosed from the usual clinical features and by a cardiac catheterization procedure and an echocardiographic study. The pre- and postoperative findings using this noninvasive technique are described.

Case report

A 38-year-old man was referred to the 'Ciudad Sanitaria La Paz' for evaluation of chest pain. One year previously the sudden onset of retrosternal pain made him faint; this had happened three times and on the last occasion he was admitted to hospital.

Physical examination revealed a blood pressure of 65/40 mmHg on the right arm, and 95/40 mmHg on the left arm; the heart rate was 60 beats a minute. The neck veins were not distended. The praecordium showed hyperdynamic left ventricular movement. A 2/4 systolic ejection murmur and an immediate diastolic murmur were heard over the aortic area and along the left sternal border. Femoral pulses were present. The electrocardiogram showed an A QRS of 30° and left ventricular hypertrophy. The carotid pulse showed a normal ejection time. Chest x-rays showed an enlarged ascending aorta with normal pulmonary arteries and normal left ventricle.

Cardiac catheterization was performed and the results of pressure measurements are shown in the Table. Serial determinations of blood oxygen saturation were normal. Cineangiograms were obtained with selective injection of 1.5 ml/kg weight of 76 per cent Urogafin into the aortic root and left ventricle at 15 kg/cm² injection pressure. These showed (Fig. 1a and b) a dissecting aortic aneurysm and grade 2/4 aortic insufficiency.

Echocardiographic studies were performed with a Unirad, 100, 2mHz transducer with a repetition rate of 1000 impulses per second. Left ventricular function studies (Fortuin et al., 1971; Fortuin, Hood, and Craige, 1971, 1972).
Angiograms. a) The right anterior oblique projection: early phase of aortography shows the true lumen of the aortic root and mild aortic insufficiency. b) The right anterior oblique projection: ventriculography shows the aortic aneurysm.

Period, with a typical box-like configuration during systole, remain in a close position during diastole; these echoes can be recorded within the anterior and the posterior aortic root echoes.

Echocardiography of the aortic root was useful in the diagnosis of dissecting aortic aneurysm by showing an abnormally dilated aortic root with normal aortic leaflets which are separated from the main anterior and posterior walls of the aortic root; the walls show two separate dominant echoes due to the dissection of the walls by the aneurysm formation. The normal postoperative aortic root echogram endorsed this assessment.

References

Requests for reprints to Dr. Pablo Yuste, c/o Enrique Larreta no. 5, 70A, Madrid 16, Spain.
FIG. 2 Echograms. a) Preoperative echogram, showing an abnormally dilated aortic root, normal aortic leaflets, and the anterior and posterior false lumen of the aneurysm. AW = anterior wall of the aortic root. PW = posterior wall of the aortic root. b) Postoperative echogram showing the aortic leaflets within the anterior (AW) and the posterior (PW) echoes from the aortic root, without any false lumen in the aortic walls.