

Department of Cardiology, Medical University of Lublin
1st Department of Radiology, Medical University of Lublin

ANDRZEJ TOMASZEWSKI, ELŻBIETA CZEKAJSKA-CHEHAB,
ANDRZEJ DROP, TERESA WIDOMSKA-CZEKAJSKA

*Giant left atrial thrombus in advanced mitral stenosis diagnosed
by echocardiography and multislice CT – case report*

In the natural development of mitral stenosis, the left atrial thrombus may be formed. As a potential source of the embolic material, the thrombus poses an extremely serious risk for the patient. The formation of the thrombus is mainly caused by hemostasis in the enlarged left atrium – the more constricted the mitral ostium the bigger the thrombus – and atrial fibrillation which is usually present (1,2).

CASE REPORT

The female patient (J.K.), aged 60 has known about her heart defect for 38 years. In 1970, after the diagnosis of mitral stenosis had been established, she was subjected to mitral commissurotomy using the closed method on the beating heart. Since that time, despite the gradually increasing clinical signs she was treated pharmacologically. At present, she is in the III functional stage according to the New York Heart Association classification. She does not give her consent for operative treatment. The successive echocardiographic examinations showed growing mitral restenosis. In 1996, the presence of the thrombus in the left atrium (2.8 x 4.1cm) was found / the valve area of 1cm² / and the antithrombotic drug (Sintrom) was introduced. Despite this treatment, in 2002 the patient was hospitalized due to slight right hemiparesis. The CT scan of her head revealed two small hypodense ischaemic foci. The neurological symptoms completely subsided and the patient is still professionally active.

EKG: atrial fibrillation with ventricular action – 78/min. The echocardiographic examination (SONOS 5500, Philips) demonstrated the presence of advanced mitral stenosis with the valve area of 0.7cm² with the giant left atrium, containing a very big oval and immobile thrombus, about 6 x 9cm (Fig. 1, 2). Both ventricles were not enlarged, the ejection fraction of the left ventricle – 52%, secondary pulmonary hypertension – max. 60mm Hg, I° mitral, aortic and tricuspid insufficiency.

Chest X-ray: cor bovinum in which the left atrium dominates. MSCT: Spiral computed tomography of the chest was conducted using the 8-row Light Speed Ultra scanner (General Electric). Pre-contrast and after iv bolus of nonionic contrast medium (130ml) scanning was performed with the following parameters: 0.8s rotation time, 8 x 1.25mm collimation and 13.5mm/s table feed. The optimum delay time was determined using the test bolus option with the successive measurements of density in the left atrium. The EKG gating was not used due to rapid heart beat and atrial fibrillation. The images were assessed on the basis of axial scan series

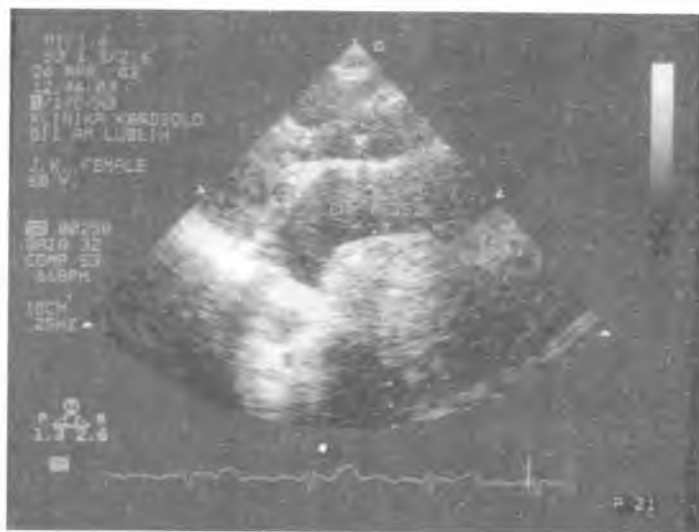


Fig.1. Echocardiography, parasternal long axis view: giant left atrial thrombus, arrows: thrombus location, A – aorta, PK – right ventricle, LK – left ventricle, ZM – thickened, calcified mitral valve

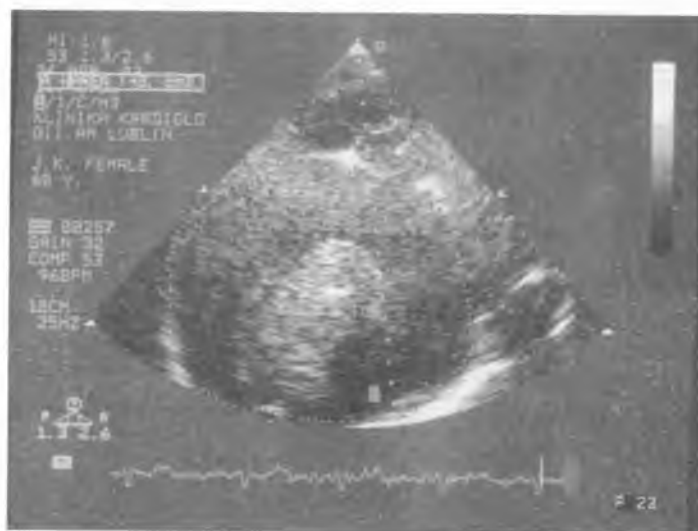


Fig. 2. Echocardiography, modified four-chamber view: giant left atrium with big thrombus inside. Planimetric left atrial area = 143 cm² (!), left ventricle area 20 cm². Sluggish echogenic blood movement around is present

and then secondary multiplanar reconstructions (MPR) in sagittal, frontal and oblique projections and 3D reconstructions with volume rendering mode were performed.

It was observed that almost all right lower and central chest was occupied by the left atrium enlarged to the giant size (17x14x12cm), which compressed and dislocated all the remaining mediastinal structures and adjacent parenchyma of the right lung. The thrombus filling the medial-inferior part of its lumen from the dorsal side was 10.3x8.1x8.4cm in size and contained numerous microcalcifications corresponding to the chronic character of the lesion (Fig. 3). The contrast medium, most likely due to sluggish blood flow in the left atrium, was

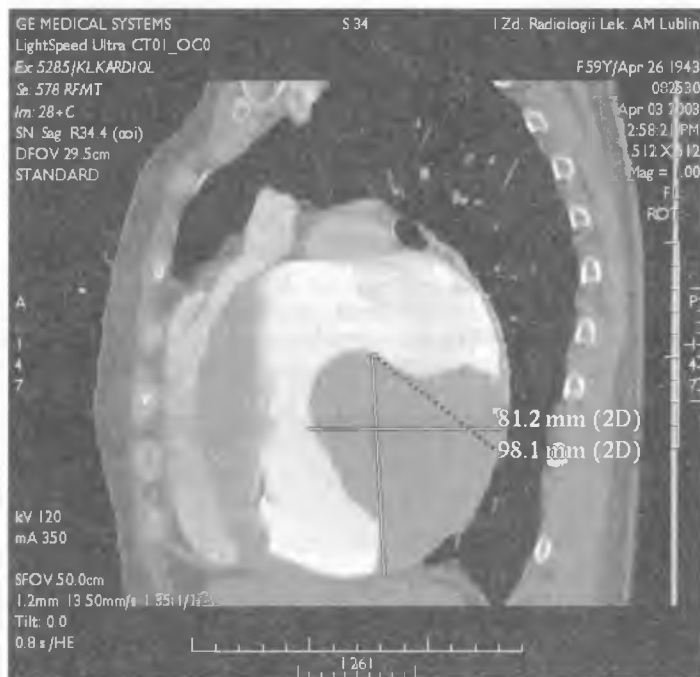


Fig.3. MSCT, sagittal MPR view presents a substantially enlarged heart silhouette with the spherical giant atrium. A partial contrast defect of the atrial cavity caused by the thrombus attached to the posterior wall. The contrast medium leveled

distributed unequally leaving the frontal leveling blood layers uncontrasted (Fig. 4). Additionally, the examination enabled us to evaluate the properly contrasted lumen of the coronary arteries in their proximal and medial parts. The cusps of the substantially thickened mitral valve were thickened to about 2mm and small calcification foci were visible on them (Fig. 5). The pulmonary venous and arterial vessels were dilated in the region of main branches with the symptoms of chronic pulmonary hypertension.



Fig.4. MSCT, 3D coronal volume rendering view shows the right part of the thoracic cavity filled with the enlarged heart. Fine calcifications visible within the thrombus

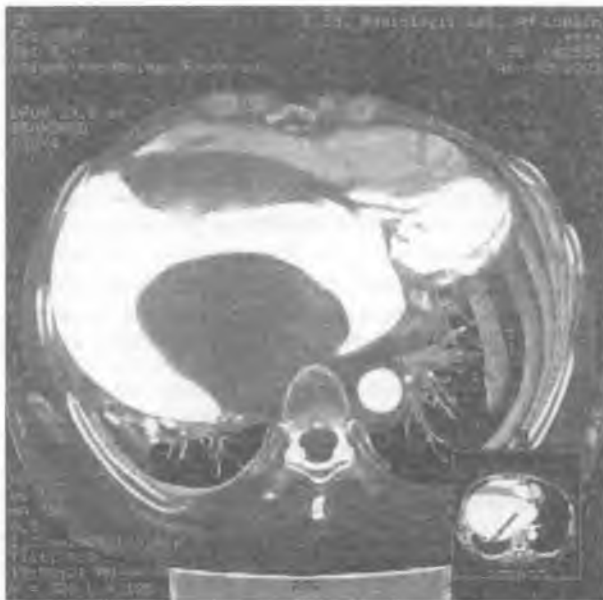


Fig. 5. MSCT, 3D oblique volume rendering view presents the level of the left venous ostium. Discrepancies in the sizes of the left atrium and left ventricle and markedly thickened cusps of the stenotic mitral valve

DISCUSSION

At the current phase of cardiosurgical development, such a late stage of mitral defects is extremely rare. After successful mitral commissurotomy performed in 1970 mitral stenosis gradually increased reaching a drastically low level of 0.7cm^2 . It is accompanied by the giant left atrium markedly filling the thoracic cavity with the $7\times 8\times 10\text{cm}$ – thrombus (!). In such complex and advanced lesions both echocardiography and MSCT provide excellent diagnostic possibilities (4,5). Unlike echocardiography, MSCT facilitates the analysis (also the retrospective one) in the unlimited number of sections and the evaluation of other chest structures. Thanks to its very short scanning time and 1-mm collimation, the method enables us to perform various types of spatial reconstructions. These reconstructions ensure excellent evaluation of the anatomical structures of the heart, including the mitral valve (5) and facilitate determination of the changes of severity in the pulmonary circulation. In our opinion, due to its advantages, MSCT seems to be a very useful method of diagnosing heart defects and may be used in planning cardiosurgical procedures.

This case illustrates that a patient with a critical mitral stenosis may lead a normal life with moderately limited physical activity. It is important to notice that the patient herself decided to refuse surgical treatment.

REFERENCES

1. Braunwald E.: Heart Disease. A Textbook of Cardiovascular Medicine. W.B. Sanders Comp., V Edition, 1007, 1997.
2. Hoffman M. et al.: Wady serca. PZWL, 290, Warszawa 1989.
3. Kornacewicz-Jach Z.: Wada mitralna. Kiedy leczyć? Kard. Pol., 48, 45, 1998.
4. Ohnesorge B. et al.: Cardiac imaging by means of electrocardiographically gated multisection spiral CT: initial experience. Radiology, 217, 564, 2000.
5. Willman J.K. et al.: ECG-gated multi-detector row CT for assessment of mitral valve disease: initial experience. Eur. J. Radiol., 12, 2662, 2002.

SUMMARY

The paper presents a rare case of the giant left atrial thrombus in the advanced stage of mitral stenosis. The clinical course of the disease was analyzed and the possibilities of imaging the lesions by echocardiography and multi-slice computed tomography were compared.

Olbrzymia skrzeplina w lewym przedsionku w przebiegu zaawansowanej postaci zwężenia lewego ujścia żylnego, oceniana w echokardiografii i tomografii wielorzędowej – opis przypadku

W pracy przedstawiono przypadek rozpoznania olbrzymiej skrzepliny w lewym przedsionku w przebiegu zaawansowanej postaci zwężenia lewego ujścia żylnego. Poddano analizie przebieg kliniczny choroby oraz porównano możliwość obrazowania przy pomocy echokardiografii i wielorzędowej spiralnej tomografii komputerowej.