CASE REPORT

Right atrial wall hematoma following percutaneous mitral valvuloplasty

Osama Rifaie (MD), Wail Nammas (MD) *

Cardiology Department, Faculty of Medicine, Ain Shams University, Cairo, Egypt

Received 18 August 2008; received in revised form 9 October 2008; accepted 17 October 2008
Available online 16 December 2008

KEYWORDS
Atrial intramural hematoma;
Mitral valvuloplasty

Summary A 50-year-old male underwent successful percutaneous mitral valvuloplasty for restenosis after surgical commissurotomy. Trans-septal puncture was difficult. Following the procedure, the patient developed chest pain and signs of systemic venous congestion, yet no hemodynamic collapse. Echocardiographic evaluation revealed a cystic mass compressing the right atrium, not communicating with the atrial cavity, mostly an intramural hematoma. The case was managed conservatively, and serial echocardiographic follow-up showed gradual reduction in size until ultimate disappearance of the mass 1 month later. In conclusion, right atrial intramural hematoma is a possible complication of mitral valvuloplasty, readily detected by echocardiography, and amenable for conservative management.

© 2008 Japanese College of Cardiology. Published by Elsevier Ireland Ltd. All rights reserved.

Case description

A 50-year-old male with history of closed surgical commissurotomy of the mitral valve 5 years previously presented with recurrent progressive exertional dyspnea of 1-year duration, currently associated with orthopnea and paroxysmal nocturnal dyspnea. Examination revealed irregular pulse, scar of prior commissurotomy, accentuated first heart sound, loud pulmonary component of the second sound, an opening snap close to the second sound, and a long mid-diastolic rumble over the apex. Echocardiography revealed severe mitral stenosis [mitral valve area 0.9 cm² by pressure halftime method], mild mitral regurgitation, and a Massachusetts General Hospital score of 11/16. Mean pressure gradient across the right ventricular inflow tract was 2 mmHg. Trans-esophageal echocardiography showed no thrombi in the left atrium or left atrial appendage and a thin interatrial septum.

Percutaneous mitral valvuloplasty was performed using the double balloon technique through a right femoral vein puncture. Trans-septal puncture was somewhat difficult. Balloon sizes (18 and 20 mm) were chosen according to mitral annular...
size measured by trans-esophageal echocardiography. Trans-mitral pressure gradient dropped from 25 to 5 mmHg.

Immediately following the procedure, the patient noted mild chest pain, yet, he was hemodynamically stable with no clinical or electrocardiographic (ECG) abnormalities. Next day, jugular vein pressure was elevated and ankle edema started to make an appearance, however, his blood pressure was 110/70 mmHg and heart rate was 80 min⁻¹, irregular. Echocardiography revealed a large mass related to the right atrial anterior wall, causing marked compression of the right atrial cavity. The mass was smooth-contoured, oval, measuring 8.5 cm × 6 cm, cystic in appearance with a capsule-like outer wall and lucent content, except for irregular echodense shadows in its posterior part. No communication was found between the mass and the right atrial cavity by color flow mapping. The right atrial cavity was reduced to a narrow conduit with marked turbulence of flow across. Mean pressure gradient across the right ventricular inflow tract increased to 7 mmHg. Mitral valve area was 1.9 cm² with grade 2/4 mitral regurgitation, and no pericardial effusion. The patient was managed conservatively by stopping oral anticoagulants and regular follow-up echocardiographic evaluations. At 2 weeks, the mass was markedly reduced in size, and at 1 month, it almost completely disappeared with complete relief of systemic venous congestion. Six months later, the patient underwent mitral valve replacement for symptomatic mitral regurgitation and no mass was found related to the right atrium intraoperatively (Figs. 1–4).

Discussion

Atrial intramural hematomas have been most frequently encountered in the left atrium [1–3], or related to the inter-atrial septum [4], with those of the right atrium being the least frequent [5,6]. The most common conditions associated with atrial wall hematomas are cardiac surgery, annular abscesses, cardiac trauma, atrial wall hemangioma, aortic dissection, spontaneous hematomas, and very rarely intramural hematomas may complicate myocardial infarction [7–9]. Recently, left atrial wall hematomas occurred as a complication of percutaneous radiofrequency catheter ablation of atrial fibrillation [10,11], most probably related to trans-septal puncture [11].

In the past two decades, percutaneous balloon mitral valvuloplasty (PBMV) has emerged as the procedure of choice in most patients with symptomatic mitral stenosis [12]. Trans-septal puncture is a pivotal step to accomplish the procedure with the trans-venous approach. In our case, trans-septal puncture was relatively difficult; however, the procedure was successfully
completed with adequate hemodynamic outcome, and a final mitral valve area 1.9 cm². Immediately following the procedure, no abnormal clinical or radiologic signs were found to explain chest pain experienced by the patient; nevertheless, the day after, signs of elevated systemic venous pressure developed without hemodynamic collapse. Echocardiographic evaluation was crucial for diagnosis of a cystic mass related to the right atrial wall, as well as for exclusion of pericardial effusion. The differential diagno-

Figure 3 Below: Apical four-chamber view after 2 weeks of conservative management showing the mass remarkably reduced in size and the right atrial cavity restored back to normal size. Above: A crop from the image below showing the size of the mass now measuring 1 cm × 3 cm.

Figure 4 Apical four-chamber view 1 month later showing the mass almost completely disappeared with normal appearance of the right atrium.

gnosis of a cystic mural mass includes hydatidosis, cystic myxomas, pseudocysts of the right atrial wall related to ventriculo-peritoneal shunts, external compression by neoplasms (for example, pleuro-pericardial cysts), hematic cysts, atrial dissection, and intramural hematomas [7]. In view of the preceding echocardiographic evaluation before the procedure, the last two possibilities are the most likely, yet, the absence of communication between the cyst and the atrial cavity makes intramural hematoma the most probable diagnosis.

To our knowledge, this is the first case reported to date in the literature of a right atrial hematoma complicating percutaneous mitral valvuloplasty procedure. Previously, one case of right atrial intramural hematoma was reported following coronary artery bypass surgery [5], and a case of right atrial wall hemangioma was treated by emergency surgery [6]. Conservative management in the form of withholding oral anticoagulants was adequate in our case — without the need for surgical evacuation — both for symptomatic relief and eventual resolution. Echocardiographic follow-up revealed gradual decrease of the hematoma size until its ultimate disappearance 1 month following the procedure. Finally, mitral valve replacement was done 6 months later for symptomatic mitral regurgitation, and the surgeon was oriented with the formerly encountered cystic mass, yet, no masses were found in relation to the right atrium intraoperatively.
Conclusion

Right atrial intramural hematoma is a possible, although very rare, complication of percutaneous mitral valvuloplasty, mostly related to difficult trans-septal puncture. Conservative management can be adequate if there is no hemodynamic collapse. Echocardiographic evaluation is pivotal for accurate diagnosis, exclusion of cardiac tamponade, and thereafter, for serial follow-up.

References