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CASE REPORT

New type of left ventricular rupture during redo mitral valve replacement. A case report

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ABSTRACT

We report the case of a 41 years old woman who presented with massive bleeding after redo mitral valve replacement.
A Left ventricular rupture, different from the three known types of wall rupture was hardly identified and controlled with extreme difficulty.
The patient died eight days postoperatively due to disseminated intravascular coagulopathy.
Retrospective analysis of the Echocardiographic examination was highly suggestive of abnormal position of the previously implanted mitral valve bioprosthesis with left ventricular outflow tract obstruction and weakness of the posterior wall of the left ventricular outflow tract.

Keywords: *cardiac surgery, mitral surgery, ventricular rupture.*

INTRODUCTION

Posterior leaflet and chordae preservation prevent left ventricular (LV) rupture and preserve LV geometry.
Age > 60 years, reoperation, and resection of the posterior leaflet, are significant risk factors for posterior LV wall rupture during mitral valve replacement (1).

CASE REPORT

We operated a 41 year old female with severe mitral regurgitation 6 years after mitral valve replacement (MVR) with a high profile bioprosthesis size 31 (we could not identify the type and or the manufacturer of the bioprosthesis). The echocardiography showed abnormal position of the bioprosthesis strut, with narrowing of the left ventricular outflow tract (LVOT) = 1.7 cm and a mean systolic gradient of 35 mmHg. (*Figures 1 and 2*).
The left ventricular (LV) cavity was smallish. Intraoperatively, it was noted that one of the bioprosthesis struts was pressing against the posterior wall of the LVOT. Redo MVR with a mechanical valve size 29 Carbomedics was performed.
Posterior MV leaflet had to be resected because of severe calcification. Ten hours postoperatively, before extubation, significant bleeding from the chest tubes was associated to hemodinamic instability. Surgical re-exploration for bleeding was performed

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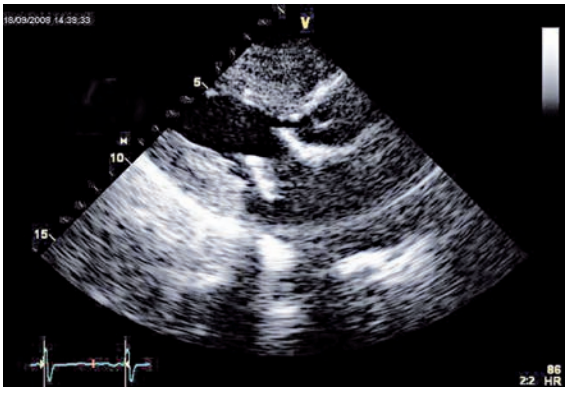

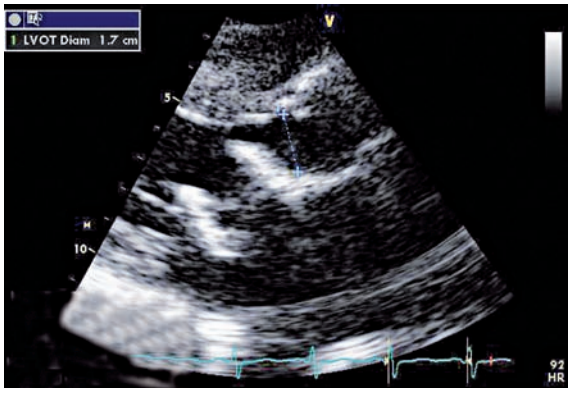

Figures 1 and 2
Pre operative echocardiogram showing the bioprosthesis malpositioned with left ventricular outflow tract obstruction.

and, although there was significant amount of bleeding coming from the area posterior to the aortic valve annulus, it was difficult to identify the bleeding site. Therefore, cardiopulmonary bypass was instituted with aortic cross clamp and cardioplegia.
Left atrium was opened and there was no problem with the new mechanical mitral valve and no tears were identified. The tear was in the posterior wall of the LVOT just below the left coronary cusp and opposite to the intertrigonal area nearer to the left fibrous trigone.
It was repaired after completely transecting the aorta above the aortic valve for proper visualization.
The tear was repaired with multiple pledgeted sutures. The patient was transferred to intensive care unit in stable condition, but unfortunately died eight days after, due to sepsis associated disseminated intravascular coagulopathy.

DISCUSSION

"Prevention is better than cure" best applies in our case report. Position of the mitral valve prosthesis is very important during MVR, especially if dealing with a bioprosthetic valve. As described in literature, posterior leaflet and chordae preservation prevents LV rupture and preserve LV geometry. There are three known types of LV rupture: Type I is located at the atrioventricular groove and remains the most common site; Type II occurs at the base of the papillary muscles, primarily due to excessive resection of the posterior papillary muscle, with local hemorrhage and rupture; Type III is located between Type I and Type II lesions, and is most often related to posterior left ventricular wall trauma, due to a high profile or large prosthetic valves, often in combination with a small left ventricular cavity (1).
To the best of our knowledge, this is the first report of a posterior LVOT wall rupture after redo MVR. From our point of view, this new type of LV rupture may be due to the abnormal position of the previously implanted mitral valve bioprosthesis strut, causing significant thinning and weakness to the posterior wall of the LVOT (2).
We think that the cause of the mitral valve improper positioning may be due to over preservation of the posterior mitral valve leaflet leading to abnormal position of the bioprosthesis. New York University experience to reduce the LV tear during mitral

valve surgery advised avoidance of undue traction on the valve leaflets during removal, careful insertion of sutures into the mitral annulus, avoidance of deeper sutures that penetrate the ventricular muscle beneath the annulus, avoidance of left ventricular vents, avoidance of lifting of the apex of the heart once the prosthetic valve had been inserted, use of translucent obturators constructed so the position of the posterior post of the prosthetic valve could be observed before the prosthesis is inserted (3, 4).

CONCLUSIONS

Rupture of the left ventricle after MVR is an infrequent but serious complication. Early diagnosis, resumption of cardiopulmonary bypass, proper exposure and complete repair of the tear is necessary to have a better outcome.

Endoventricular repair is better than epicardial approach. We advise not to over-preserve the posterior leaflet at the expense of the position or size of the prosthesis and or the LVOT.

No conflict of interest exists.

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