# Papillary Muscle Rupture after Benttal Operation: Is It Necessary to Do CABG in High-Risk Patients?

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## Abstract

Papillary muscle rupture following acute myocardial infarction (AMI), which rarely occurs, leads to catastrophic outcomes. A 56-year-old man with sudden dyspnea and palpitation, one episode syncope, and left sided hemiparesis was admitted to our hospital and diagnosed as type A dissection with extension to the aortic arch and descending aorta. The patient underwent the Benttal and hemiarch procedure.

On the 16th postoperative day, he suddenly developed hypotension and respiratory distress. Urgent echocardiography showed severe acute mitral regurgitation due to the rupture of the posteromedial papillary muscle. Urgent mitral valve replacement was done but unfortunately the patient died two weeks after the second surgery because of sepsis. We propose that during urgent cardiac surgery in a patient with coronary risk factors, concomitant coronary artery bypass graft be performed as thoroughly as possible**(*Iranian Heart Journal 2011; 12 (2):49-51).***


**Key words:** **Aor**tic dissection■papillary muscle rupture■ echocardiography

Papillary muscle rupture is a rare but generally fatal mechanical complication of acute myocardial infarction (MI). Papillary muscle rupture (PMR) occurs in 1 to 3% of patients with acute MI and leads to severe mitral regurgitation (MR), pulmonary edema, cardiogenic shock, or some combination of these findings. [1,2] If this rupture is surgically untreated, the prognosis is poor: approximately 80% mortality rate in the first 24 hours.[1,2]

**Case report**

A 56- year-old hypertensive man was admitted to our hospital with sudden onset dyspnea, palpitation, one episode syncope, and left-sided hemiparesis. On physical examination, asymmetrical hypertension (SBP= 190 mmHg in right arm, and 160 mmHg in left arm) with signs of bilateral hemispheric dysfunction were noted. An early to mid diastolic murmur was audible in the aortic area.

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motion abnormality, dilated ascending aorta with a dissecting flap through the ascending aorta just at the right coronary sinus with prolapse to the LVOT and extension to the aortic arch and descending aorta with partially thrombosed false lumen.

The patient was urgently taken to the operating room and the Benttal operation without coronary artery bypass grafting was done. The patient had uneventful course in the ICU until the 16 th postoperative day, when he suddenly developed severe hypotension with respiratory distress, which resulted in repeat intubation. On examination, he had no audible new murmur in auscultation probably due to diffuse crackles of both lungs and mechanical ventilation.

Under inotropic agent, blood pressure was 80/40 mmHg and pulse rate 100 bpm and regular. Due to unstable hemodynamic state, transthoracic and transesophageal echocardiographic examinations were done, which showed severe LV systolic dysfunction, akinesia of inferior and posterior walls, and severe mitral regurgitant jet along the anterior wall of the left atrium with a ruptured papillary muscle prolapsing into the left atrium (Figs 1, 2).

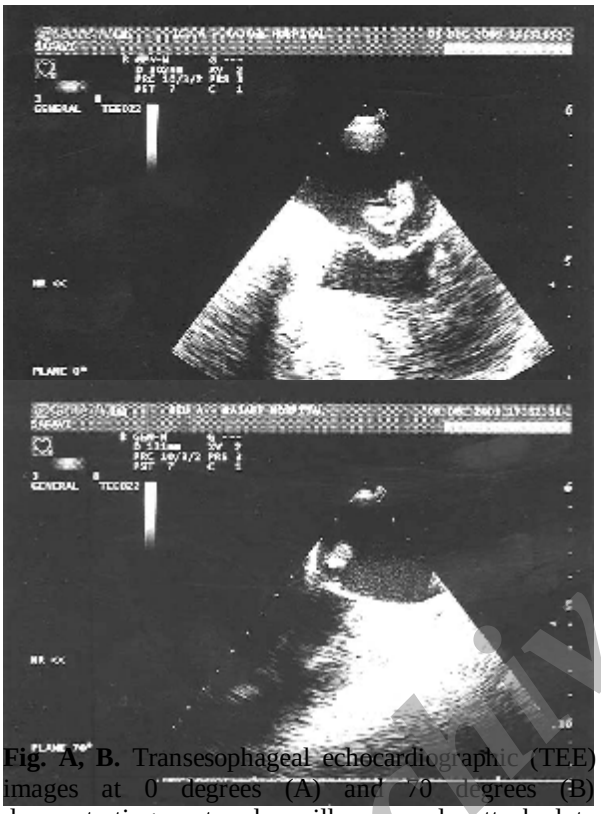

**Fig. A, B.** Transesophageal echocardiographic (TEE) images at 0 degrees (A) and 70 degrees (B) demonstrating ruptured papillary muscle attached to the posterior mitral leaflet and prolapsed into the LA during systole

The prosthetic aortic valve and aortic conduit graft were normal. In electrocardiography, new Q wave in the inferior leads and dynamic ST-segments depression and T wave inversion were found. The patient was candidated for emergent operation and was taken to the operating room. The patient underwent mitral valve replacement. After the operation, he had clinical improvement in the first several days, but due to sepsis and septic shock he died two weeks after the second operation.

## Discussion

We report an unusual case of the rupture of the papillary muscle without obvious symptoms and signs of recent MI. Papillary muscle necrosis with rupture and acute severe MR is a life-threatening complication of MI that requires surgical intervention. In patients with cardiogenic shock after MI, the presence of MR predicts a poor outcome.[3] In the Olmsted Country study, MR also predicted heart failure and mortality.[4] In a recent review of papillary muscle rupture, 15 of 17 cases occurred in patients with inferior infarction and posterolateral papillary muscle.[5]

The more frequent involvement of the posteromedial papillary muscle is the result of its blood supply from a single coronary artery supply of the anterolateral papillary muscle .Chordae to both leaflets arise from each of the papillary muscle so that in cases of complete rupture of the entire trunk of a papillary muscle, both leaflets are affected. In less severe cases, the rupture is incomplete and only a single head is torn. In our patient, the rupture was complete and associated with electrocardiographic changes.

## Conclusion

We propose that during urgent cardiac surgery in a patient with coronary risk factors without previous evaluation of coronary arteries, concomitant coronary artery bypass graft be performed as thoroughly as possible.

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