New Segmental Regional Wall Motion Abnormalities on TEE Following Mitral Valve Annuloplasty

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Introduction: New regional wall motion abnormalities (NRWMA) are frequently observed following cardiac surgery. Whether or not these truly represent ischemia can be difficult to decipher. We present a rare case of NRWMA due to inadvertent surgical occlusion of the circumflex artery during mitral valve annuloplasty.

Case Presentation: A 50-year-old male presented with shortness of breath. Transesophageal echocardiography (TEE) revealed moderate mitral regurgitation due to a flail P2. A repair was performed through a right mini-thoracotomy, which included chordal resuspension of P2, closure of a posterior cleft, and insertion of a flexible ring. At the completion of the procedure, TEE revealed marked inferolateral left ventricular akinesis. There were also new persistent ST elevations observed on the ECG in lead II. Air emboli in the coronary arteries were suspected, and intravenous vasoconstrictors were administered. Unfortunately, the NRWMA did not improve. The possibility of surgical interruption of a coronary artery was discussed with the surgeon but no diagnostic intervention was pursued at this time. The patient remained on cardiopulmonary bypass (CPB) for over an hour while being monitored closely via TEE. Eventually, the patient was weaned from CPB and transferred in stable condition to the ICU. A 12 lead ECG revealed large ST elevations in the inferolateral leads. Troponin T levels were also substantially elevated. The patient recovered well and was discharged home twelve days later but returned to the ER just hours after discharge with chest pain. A diagnostic coronary angiogram was emergently performed and revealed complete occlusion of the circumflex artery. He was discharged home six days later in stable condition.

Discussion: NRWMA following mitral valve surgery are common and are most often due to air emboli. A less common cause may be due to an injury of a coronary artery. Initial treatment involves administering therapy to increase coronary perfusion pressure as well as myocardial contractility. In this case, there were NRWMA that did not improve with time or therapy. An angiogram revealed what was suspected, which was a complete occlusion of the circumflex artery; a normal circumflex was visualized in an angiogram just a month prior. The angiogram also revealed that this patient was one of approximately 15% of patients who have left dominant coronary anatomy. These patients are at much higher risk than right dominant patients of undergoing injury to their circumflex coronary artery during mitral valve surgery.¹ This is most likely due to a narrower distance between the mitral annulus and the circumflex artery found in left dominant patients. One study found the distance to be as little as 1 mm in these patients.² Although this is a documented phenomenon, it has only been reported a handful of times in the literature with only one case report involving right dominant anatomy.³ In conclusion, left dominant patients are at higher risk of circumflex injury during mitral valve annuloplasty, and this potential complication should be considered when there are persistent NRWMA seen on TEE.

References: