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Case Report

Intra-operative diagnosis in an adult patient operated with the pre-diagnosis of ventricular septal rupture after acute infero-posterior myorcardial infarction: Congenital posterior ventricular septal defect.

Akut infero-posterior miyokard enfarktüsü sonrası ventriküler septal rüptür ön tanısı ile ameliyat edilen erişkin bir hastada intraoperatif tanı: Konjenital posteriyor ventriküler septal defekt.

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Abstract

Ventricular septal rupture is one of the most important and life-threatening mechanical complications of myocardial infarction. In particular, infero-posterior ventricular septal defect occurring after posterior myocardial infarction is a more catastrophic clinical condition and surgical treatment is more difficult. In an adult patient with myocardial infarction, a ventricular septal defect was found in the posterior ventricular septum. The patient developed pulmonary edema was diagnosed with ventricular septal rupture as a mechanical complication in addition to myocardial infarction. However, while it was observed that ventricular septal rupture did not occur as a mechanical complication due to myocardial infarction in surgical treatment, and it was determined that the patient had a congenital ventricular septal defect accompanying coronary artery disease. Congenital posterior ventricular septal defect was successfully closed with a Dacron patch via right atriotomy. Since we have not encountered such a case in the literature before, we want to present this case.

Keywords: Congenital ventricular septal defect; post MI ventricular septal defect; coronary arterial disease; surgical treatment.

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ÖZ

Ventriküler septal rüptür, miyokard enfarktüsünün en önemli ve hayatı tehdit eden mekanik komplikasyonlarından biridir. Özellikle posterior miyokard enfarktüsü sonrası oluşan infero-posterior ventriküler septal defekt daha ağır bir klinik durumdur ve cerrahi tedavisi daha zordur. Miyokard enfarktüslü erişkin bir hastada posterior ventriküler septumda ventriküler septal defekt bulundu. Pulmoner ödem gelişen hastaya, miyokard enfarktüsüne ek, mekanik komplikasyon olarak gelişen ventriküler septal rüptür tanısı konuldu. Ancak cerrahi tedavide miyokard enfarktüsüne bağlı mekanik bir komplikasyon olarak ventriküler septal rüptür izlenmezken, hastanın koroner arter hastalığına eşlik eden doğuştan ventriküler septal defekt olduğu belirlendi. Konjenital posterior ventriküler septal defekt sağ atriyotomi yaklaşımıyla Dacron yama kullanılarak başarılı bir şekilde kapatıldı. Literatürde daha önce böyle bir vaka ile karşılaşmadığımız için bu vakayı sunmak istedik.

Anahtar kelimeler: Konjenital ventriküler septal defekt; MI sonrası ventriküler septal defekt; koroner arter hastalığı; cerrahi tedavi.

Introduction

Detection of congenital posterior ventricular septal defect (VSD) in a patient operated with the diagnosis of coronary artery disease and ventricular septal rupture (VSR) is the important emphasis of this presentation. Second, the management of the surgical intervention to be performed is also important. Although several surgical interventions have been developed for posterior VSD (post MI or congenital), mortality and complications due to surgical treatment remain high, especially in relation to the trans-ventricular approach. For this reason, we performed VSD repair with a right atrial approach to our patient. And we discharged our patient without any complications.

This presentation shows us that the cause of ventricular septal damage detected after myocardial infarction involving the posterior wall of the heart is most likely a mechanical cause related to coronary artery disease. However, it should be kept in mind that patients may have a congenital ventricular septal defect not associated with a complication of coronary artery disease and previously undiagnosed.

Case

A 57-year-old farmer, who previously had no cardiac symptoms, was admitted to a rural hospital with the complaints of sweating, chest pain and severe shortness of breath. The electrocardiogram showed ST segment elevations in the inferior leads (Figure 1A). Also, on the telecardiography, there was a pulmonary ground glass image indicating intense pulmonary edema (Figure 1B). The ejection fraction was found 35% by the echocardiography. In addition, blood flow passage was detected in the ventricular septum between the right and left ventricles of the heart in the basal segment in the posterior part of the heart (Figure 1C). The patient was diagnosed with posterior post MI VSR due to right ventricular myocardial infarction. Coronary angiography showed that complete occlusion in the middle of the right coronary artery, 90% stenosis in the obtus marginal branch of the circumflex artery and normal the left anterior descending coronary artery (Figure 2). Stent placemend was made in the right coronary artery with percutaneous coronary intervention (PCI). However, distal perfusion of the right coronary artery was insufficient and the artery diameter was thin. No attempt was made to the obtus marginal artery (Figure 2). The patient was referred to our hospital for coronary artery bypass surgery and VSR repair. Intra-aortic balloon pump (IABP) was inserted immediately. A median sternotomy was performed and cardiopulmonary bypass (CPB) was created through the ascending aorta and bi-caval cannulation. Simultaneously, 2 the saphenous vein was harvesting from the left calf. The right atrium was opened along the edge of the atrio-ventricular groove. Anterior and septal tricuspid leaflets were removed, and the right ventricle was made visible. A septum defect with a diameter of about 1.5 cm was seen in the basal lower septum. Due to myocardial infarction, necrotic remnants in the defect in the muscle layer of the posterior septum, ecchymotic discoloration in the tissue, the prominence of the weakened muscle layer and the easily ruptured tissue was supposed to be observed. The absence of these findings and images that made the diagnosis of post MI VSR showed us that this defect was a congenital ventricular septal defect. It was understood that the congenital septal defect in addition to the myocardial infarction and the impaired ventricular functions rapidly put the patient into pulmonary edema and right heart failure. It was decided to perform coronary bypass and ventricular septal defect closure procedures. 12 pledged stitches supported with 2-0 prolene were sutured along the edge of the VSD using the interrupted horizontal mattress method (Figure 3). Sutures near the septal leaflet were sewn along the

ring of the septal leaflet, and the stitches for the lower margin were sewn from the lower free wall of the right ventricle as in the surgical practice of Cicekcioglu et al. [1]. Although stent placement was made to a right coronary artery, we performed right coronary artery bypass for the risk of acute thrombosis. Then, bypass grafting was performed on the optus marginal artery with 2nd saphenous vein. The patient was weaned from CPB without any complications. Right ventricular dysfunction was detected in the immediate postoperative transthoracic echocardiogram (TTE). IABP was removed from the patient on the postoperative 3rd day. The patient was discharged 20 days after the operation. There was no evidence of residual VSD and right ventricular function was normal.

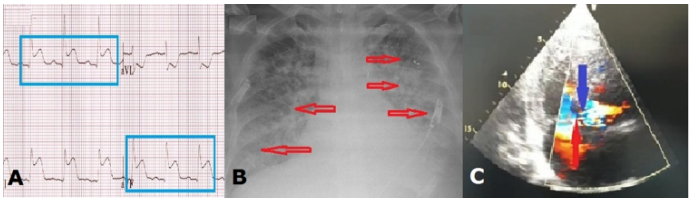

Fig. 1A. Electrocardiogram. Figure showing ST segment elevations showing for ventricular myocardial infarction (blue frames).

1B. Telecardiogram. The picture of intense pulmonary edema (red arrows).

1C. Echocardiography. A preoperative TTE reveals shunt flow through the ventricular septal rupture (red and blue arrow).

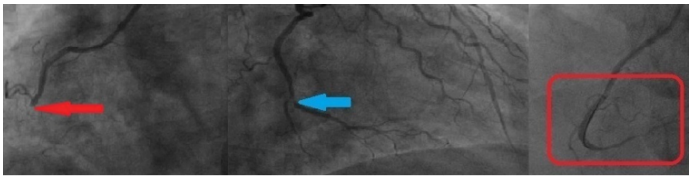

Fig. 2. Preoperative angiography. Left anterior oblique cranial view shows near total occlusion at the middle right coronary and stenosis in the obtus marginal artery (red and blue arrows). In addition, the PCI procedure to the middle segment of the right coronary artery is seen (red frame).

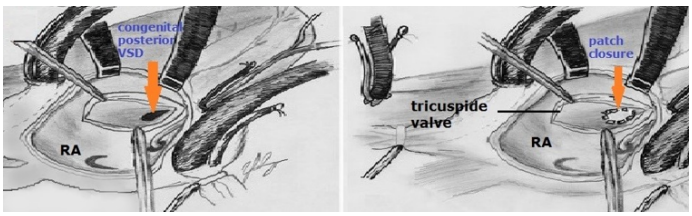

Fig. 3. Schematic view after repair. Closure of the posterior ventricular septal defect with a patch after removal of tricuspid valve leaflets from the right atrial tract [1].

Discussion

Post-infarction VSR occurs in only 1-2% of myocardial infarction patients. Several risk factors are associated with post-infarction VSR: initial infarction, inferior location, transmural infarction, complete and sudden occlusion of a coronary artery, poor collateral blood flow, and left ventricular hypertrophy. With the development of percutaneous coronary intervention, the incidence of post-infarction VSR has decreased; however, mortality remains high [2,3]. In addition, there are rare cases of VSD that survive until adulthood and do not affect hemodynamic findings. These patients can sometimes continue their lives without any clinical symptoms.

Many surgeons delay surgery while waiting for myocardial fibrosis to occur, because this makes surgical repair easier in post-MI VSR cases. Our patient underwent emergency surgery because of acute myocardial infarction, pulmonary edema, signs of right heart failure, significant left-to-right shunt and hemodynamic impairment. However, at the operation, it was determined that it had congenital VSD, not post MI VSR as expected. The patient's inadequate hemodynamic condition and poor clinical picture led us to emergency surgery. Post MI VSR table has played an important role in saving the patient's life by bringing the patient's time to surgery earlier. If the hemodynamic status was stable, we would have wanted to wait for the operation for improvement in VSR tissue and ventricular function. In this case, the patient's condition could worsen. Early surgery and repair resulted in a successful surgery for the patient.

Most surgeons perform the VSR operation through left ventriculotomy or free wall with infarction. However, in the case of posterior VSR, access via left ventriculotomy or free wall with infarction is difficult. Ventricular incision also has several disadvantages: increased postoperative bleeding, ventricular dysfunction, and ventricular arrhythmia. Filgueira et al. described the transatrial approach to repair VSR to avoid some of the problems of ventricular incision [4]. Led to this information, we decided that the transatrial approach would be more appropriate. Few studies have reported on the transatrial approach. Massetti et al. found that posterior VSR could be successfully repaired via the transatrial approach [5]. By avoiding additional damage to the ventricle, it reduces the risks of postoperative bleeding and enhances survival. Lee et al. also reported a successful right atrial approach for post-infarction posterior VSR [6].

Tricuspid valve injury is a possible danger in patients with a right atrial approach. Another potential challenge is postoperative residual shunt. Frassani et al. reported that residual defect is seen in 10% to 25% after traditional operative repair [7]. In the

control performed at the end of the operation in our patient, no insufficiency was detected in the tricuspid valve and there was no residual shunt.

Conclusion

If a defect in the posterior ventricular septum is detected in a patient with myocardial infarction, this defect is probably a septal rupture, but it should be kept in mind that there may be a congenital posterior ventricular septal defect.

Declaration of conflict of interest

The authors received no financial support for the research and/or authorship of this article. There is no conflict of interest

*Study approval was obtained from the Local Ethics Committee. Informed consent was obtained from the patient's parents and the principles of the Declaration of Helsinki were followed.

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