Repair of a traumatic aorto-right ventricular fistula following a stab wound

Penetran yaralanma sonrası gelişen travmatik aorto-sağ ventriküler fistül onarımı

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Introduction

Penetrating cardiac injuries are mostly seen on the anterior wall of the heart. Aorto-atrial and aorto-right ventricular fistulas rarely occur after penetrating injuries (1). This pathology was first reported in 1958 by King and Schumaeker (2). Samuels et al. (3) reported a total number of 41 cases in the literature between 1958-1998. We report a case of traumatic aorto-right ventricular fistula after a penetrating cardiac trauma.

Case Report

A 17-year-old boy referred to our clinic with a thoracotomy scar and a drain at left hemithorax. Primary intervention report showed that the patient was recalled to the emergency department because of a penetrating chest trauma due to stab in the 4th intercostal space and 1.5 centimeter defect on the free wall of the right ventricle was repaired three days ago in another hospital. The patient was hemodynamically stable at the time of admission. Transthoracic echocardiographic (TTE) examination showed a continuous flow between the aorta and the right ventricle and a dilated right ventricle (Fig. 1).

The patient underwent a second operation. After median sternotomy, organized hematoma around the heart was seen and removed. Aortobicaval cannulation performed and cardiopulmonary bypass was established with standard technique. The sutured stab wound was seen on the right ventricle free wall (Figure 2). After aortotomy, it was seen that the one centimeter long mouth of the fistula was opening to right coronary ostium and the laceration was extending to the aorta (Fig. 3). Aortic root was dissected entirely to see the right coronary part. The fistula at the base of right coronary artery which was extending to the right ventricle was ligated with pledgeted suture of 5/0 prolene. There was another laceration at the proximal part of the right coronary artery beginning from ostium, which was approximately one centimeter long. This part of the coronary arterial wall was thinner and injured. We decided to ligate the right coronary artery and performed a aorto-right coronary artery bypass with a saphenous vein graft. At postoperative follow-up, no hemodynamic problem or electrocardiographic abnormality were observed. Control TTE performed at 5th postoperative day showed complete closure of the fistula. The patient had an uncomplicated recovery and was discharged home on postoperative day 5 with complete remission.

Discussion

Traumatic aorto-right ventricular fistulas are rare lesions after penetrating thoracic injuries. Although aorto-right ventricular fistulas are well tolerated initially, most of them result in heart failure over a variable period. Once intracardiac injury is detected, early surgical repair is recommended to prevent cardiac decompensation and endocarditis (3, 4).

In penetrating chest trauma situations, the presence of continuous murmur in the physical examination requires further research. The absence of evident cardiac symptoms should not eliminate the probability of an underlying intracardiac lesion. The intracardiac pathology can be demonstrated and determined echocardiography (5- 7).

Definitive surgical intervention can be delayed until full cardiac catheterization and angiographic evaluation are completed. However, we recommend early surgical repair during the patient's hospital stay period. Early surgical repair has some advantages such as; prevention of cardiac decompensation, decrease of the risk for endocarditis, prevention of excessive adhesions which makes it difficult for reoperations, correction of a simple laceration easily beside repairing a long fistula tract, prevention of outpatient follow-up loss, and prevention of frequent patient follow up for determining the next operation's timing (3, 8). Moreover, the surgery, which was performed before worsening of the patient's general health status, reduced the risk of mortality and morbidity.

The isolated fistula becomes more tolerable after the treatment of cardiac tamponade and repair of damaged cardiac tissue with an emergent surgery (9). However, the absence of a complete remission in patient's general health status must direct the cardiologists and heart surgeons for further research. It is definitely mandatory to correct the determined fistula by any method, mostly surgically.

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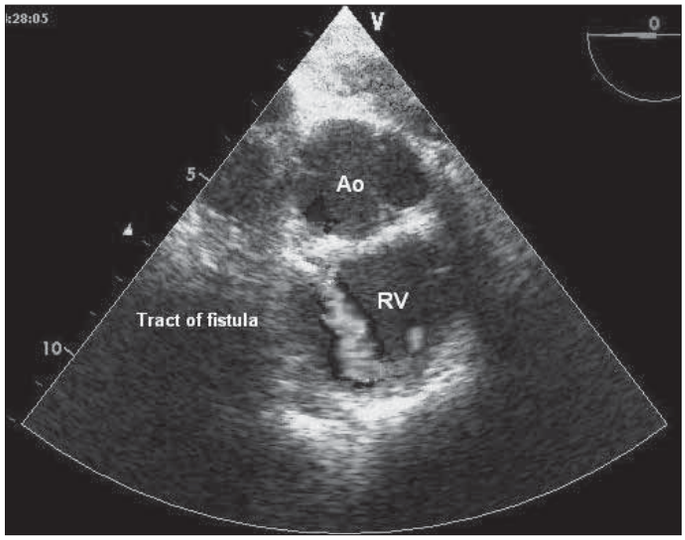

Figure 1. Transthoracic echocardiographic examination view of a continuous flow between the aorta and a dilated right ventricle

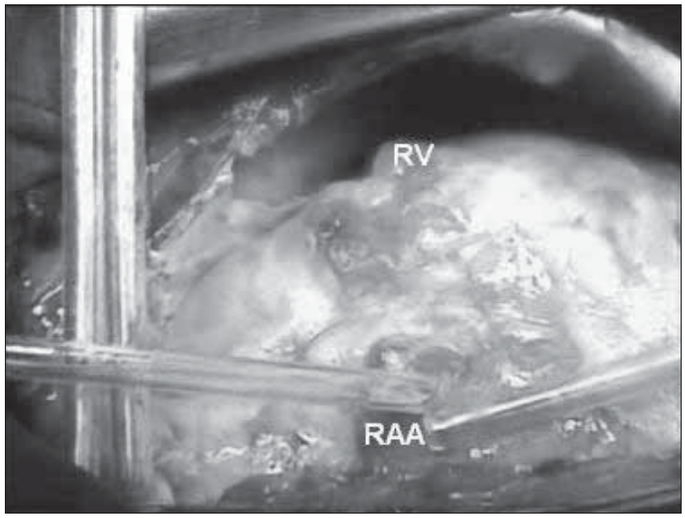

Figure 2. Intraoperative view of the sutured stab wound on the right ventricle free wall

Conclusion

Emergent surgery saves the patient's life in all cases but secondary risk for any other complications remain with problems. In penetrating chest trauma situations, transesophageal echocardiography performed at operation room for the evaluation of intracardiac pathologies prevented possible harms, which can occur at postoperative follow-up.

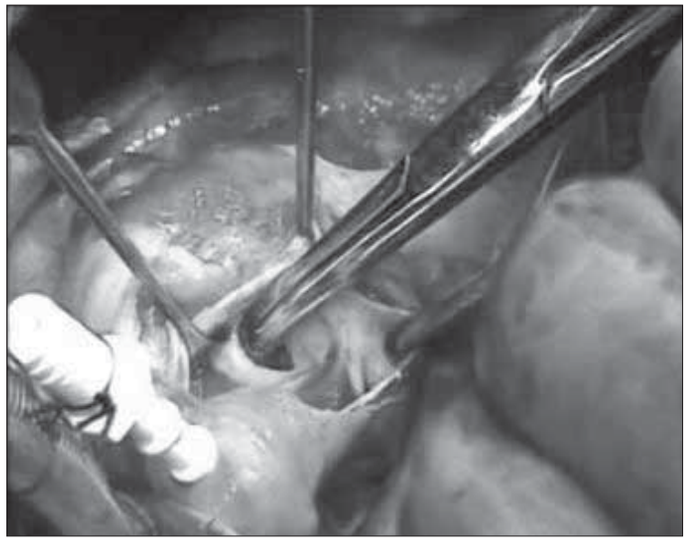

Figure 3. Intraoperative view of a one-centimeter long mouth of the fistula opening to right coronary ostium and the laceration extending to the aorta

Nevertheless, once an intracardiac fistula is detected after an emergent surgery, early surgical repair is recommended to prevent cardiac decompensation and endocarditis.

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