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Case report / Olgu Sunumu

Combined coronary artery bypass surgery with total correction of tetralogy of Fallot in a middle-aged patient

Fallot tetralojisinin total korreksiyonu ve koroner arter baypas cerrahisi ameliyatının birlikte uygulandığı orta yaşlı bir olgu

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Cyanotic congenital heart disease is rarely associated with coronary heart disease. In this article, we report a 56-years-old male patient who had a history of tetralogy of Fallot and coronary artery disease and underwent a combined procedure including total correction and coronary artery bypass grafting.

Key words: Combined coronary artery bypass grafting, tetralogy of Fallot, total correction.

Siyanotik doğuştan kalp hastalığı, koroner kalp hastalığı ile nadiren ilişkilendirilir. Bu yazıda, Fallot tetralojisi ve koroner arter hastalığı öyküsü olan ve kombine total korreksiyon ve koroner baypas ameliyatı uygulanan 56 yaşında bir erkek hasta sunuldu.

Anahtar sözcükler: Kombine koroner arter baypas greftleme, Fallot tetralojisi, total korreksiyon.

Coexistence of coronary artery disease and congenital heart diseases have been rarely reported. This might be due to the dilated coronary arteries or the paucity of atherosclerosis in the coronary arteries of patients with cyanotic congenital heart diseases. This is a case report of tetralogy of Fallot (TOF) with coronary artery disease that was successfully repaired with a combined surgical procedure that included total repair of TOF and coronary artery bypass grafting (CABG).

CASE REPORT

A 56-year-old male patient was referred to our hospital after a sudden onset of chest pain that was radiating to his left arm. His physical examination revealed dyspnea at rest and mild cyanosis of the lips. The vital parameters showed a heart rate of 92 beats/minute, a blood pressure of 150/80 mmHg in the upper extremities, and a saturation of 90% in the pulse oximeter monitoring. His cardiac examination showed a grade 4/6 holosystolic murmur that was most audible at the lower sternal border. An electrocardiographic study confirmed a normal sinus rhythm, a right ventricular hypertrophy, and ischemic changes at the lateral chest leads, and his chest X-ray showed a decrease in pulmonary vascular markings and enlargement of the cardiothoracic index. An echocardiographic exam revealed a subaortic ventricular septal defect (VSD) at a diameter of 28 mm, an overriding of the aorta at 50%, and a mild stenosis of the infundibulum at the right ventricular outflow tract with a predominantly left-to-right shunt through the VSD at rest ("pink" Fallot). Consequently, coronary angiography was confirmed by the following observations: 90% stenosis of the proximal segment of the left anterior descending coronary artery, 70-80% at the first obtuse marginal branch of the circumflex coronary artery, and 90% at

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the crux portion of the right coronary artery. A cardiac catheterization study also revealed a subaortic VSD, and a mild infundibular stenosis was observed in the right ventricular outflow tract, which was associated with a 40 mmHg gradient; therefore, a combined surgical procedure was planned.

After a median sternotomy, pericardial stay sutures were inserted. Following aortic and bicaval venous cannulation, cardiopulmonary bypass (CPB) was established and moderate hypothermia (28 °C) was achieved. A vent was placed into the right superior pulmonary vein for decompression of the left ventricle. After a single dose of cold blood cardioplegia, intermittent use of anterograde and retrograde blood cardioplegia was initiated for myocardial protection. The right ventricle was opened through a vertical incision in the midportion of the right ventricle infundibulum. Then the parietal and septal extensions of the infundibular septum were dissected and amputated. Ventricular septal defect closure was performed by the use of a Gore-Tex® patch and interrupted Teflon pledgeted 5/0 prolene sutures. The right ventricular outflow tract was reconstructed with a polytetraflouroethylene (PTFE) patch. The CABG was performed in three vessels, and the anastomosis included the left internal mammarian artery to the left anterior descending coronary artery, a vein graft from the aorta to the first obtuse marginal branch of the circumflex coronary artery, and another vein graft from the aorta to the right descending posterior branch of the right coronary artery. After completing the surgical procedure and de-airing the heart, reperfusion was started. Intravenous administration of inotropic agents, including dopamine at a renal dose of 4 μg/kg/min and dobutamine at 10 μg/kg/min, were started before completion of CPB. At the end of CPB, a measurement of the systolic pressures of the right ventricle and systemic aortic pressures revealed a ratio of 0.4.

DISCUSSION

This case report is unique in that it presents a middle-aged patient without any history of congenital heart disease and it manifests itself in a clinical presentation of ischemic heart disease. From 1969 until the present, there have been only a few reports of the coexistence of TOF and atherosclerotic coronary artery diseases. These reports include interventions such as medical management, percutaneous coronary interventions, and CABG.[1,2] In childhood, TOF is a common cyanotic heart defect, and in adults, it is the most prevalent cyanotic congenital heart defect.[3,4] In TOF, the degree of obstruction to the pulmonary blood flow determines the clinical state of the patient. An unrepaired TOF case at an older age is associated with mild pulmonary obstruction that allows survival beyond childhood. Patients with cyanotic heart diseases, including TOF, were known to have dilated ectatic coronary arteries and were traditionally believed to lack coronary atherosclerosis.[5] The proposed protecting factors against atherosclerosis in TOF were low cholesterol levels, hypoxemia (offering protection similar to hypoxemic erythrocytotic residents of high altitudes), upregulated nitric oxide, low platelet counts, and hyperbilirubinemia.[6] In a recent report of five patients with TOF and co-existing coronary atherosclerotic disease, a combination of several different techniques, including medical, interventional and surgical treatments, were reported.

In our case, the patient was fortunate to have had no surgical intervention due to the well-balanced TOF defect and adequate pulmonary stenosis. In addition, the presence of hypertension in middle-aged males, such as our patient, is a predisposing risk factor for coronary artery disease. The development of chest pain was a sign that caused the patient to seek medical attention. Diagnosing the patient early with the help of cardiac and coronary catheterization was the impetus for the medical staff to consider the combined surgical procedure comprised of total correction of TOF and CABG. This type of combined procedure is associated with more postoperative complications, thus causing a higher mortality rate. However, in this case, the postoperative course was uneventful, and the patient was discharged from the hospital within 10 days.

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