

## Repair of chronic type 1 dissection in a patient with coronary artery anomaly

*Koroner arter anomalili bir hastada kronik tip 1 diseksiyonun onarımı*

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### ABSTRACT

Although surgical intervention is considered to be the most appropriate therapeutic choice for acute type 1 dissection even in asymptomatic cases, the diameter of ascending aorta is critical for decision in chronic asymptomatic cases. In this article, we report a 50-year-old male case of chronic type 1 dissection with left main coronary artery originating from the right coronary sinus. Acute type 1 dissection probably occurred two months ago and the patient was misdiagnosed with pulmonary edema. During surgery, the dissection flap fenestration at the level of proximal aortic arch, the Bentall procedure with one button re-implantation, and the left anterior descending coronary artery-left internal thoracic artery anastomosis was done. After an uneventful postoperative period, the patient was discharged with full recovery on the 10<sup>th</sup> day.

**Keywords:** Aortic dissection; coronary vessel anomaly; surgery; fenestration.

Type 1 aortic dissection takes place under the title of acute aortic syndrome along with aortic intramural hematoma and penetrating aortic ulcer.<sup>[1]</sup> There are few reports on early and long-term survival of chronic type 1 aortic dissection cases receiving either medically or surgically treatment. Early and accurate diagnosis and treatment of acute form of the disease are the most important components to reduce mortality.<sup>[1]</sup>

When the coronary artery passes between the aorta and pulmonary artery, sudden death may occur due to the extrinsic coronary arterial occlusion. In addition, coronary circulation arising from anomalous origin

### ÖZ

Akut tip 1 diseksiyonda olgular asemptomatik olsa dahi, cerrahi tedavi en önemli tedavi seçeneği olarak düşünülmesine rağmen, kronik asemptomatik olgularda cerrahi tedavi kararı için çıkan aortun çapı önem arz etmektedir. Bu yazıda, sol ana koroner arterin sağ koroner sinüsten çıktığı kronik tip 1 diseksiyonu olan 50 yaşında bir erkek olgu sunuldu. Akut tip 1 diseksiyon muhtemelen iki ay önce gelişmişti ve pulmoner ödem ile yanlış tanılanmıştı. Ameliyat sırasında arkus aorta proksimal seviyesinde diseksiyon flep fenestrasyonu, tek buton reimplantasyonu ile Bentall işlemi ve sol ön inen koroner arter-sol internal torasik arter anastomozu yapıldı. Sorunsuz ameliyat sonrası dönemi takiben, hasta tam şifa ile 10. günde taburcu edildi.

**Anahtar sözcükler:** Aort diseksiyonu; koroner damar anomalisi; cerrahi; fenestrasyon.

of coronary ostium from the opposite sinus may cause myocardial ischemia due to the exit angle or intramural course of coronary artery.<sup>[2]</sup> In our case, we present a case diagnosed with chronic type 1 dissection with an anomalous origin of a coronary artery.

### CASE REPORT

A 50-year-old male patient was hospitalized with a misdiagnosis of pulmonary edema in another clinic two months ago based on his symptoms of coughing and dyspnea. He was, then, admitted to our emergency service with angina. Thoracoabdominal



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contrast-enhanced computed tomography (CT), echocardiography, and CT angiography were performed after hospitalization.

The ascending aorta was measured to be 5.9 cm and a dissection flap in the ascending aorta was reported in CT. The false lumen was large enough to compress the true lumen and left renal artery was supplied from the false lumen. In echocardiography, the aortic root width and the widest part of the aorta were measured to be 4.1 cm and 5.9 cm in diameter, respectively, and severe aortic valve insufficiency was detected. The chest and abdominal CT angiography revealed type 1 dissection originating from the ascending aorta.

Cardiology team hesitated to perform conventional angiography due to the dissection flap at the level of ascending aorta and therefore coronary CT angiography was done which showed right coronary artery (RCA) and left main coronary artery (LMCA) originating from the right coronary sinus sharing a common root. The left main coronary artery was moderately stenotic after arising from the right coronary sinus due to the compression between the aortic root and pulmonary artery with a 50% stenosis in the proximal portion of the left anterior descending artery (LAD). Circumflex artery was non-dominant. There was no lesion in the right coronary artery.



**Figure 1.** Perioperative appearance of single coronary button and aortic root.

### Operative technique

The procedure was performed under cardiopulmonary bypass (CPB) with deep hypothermic circulatory arrest (DHCA) at 18 °C, right axillary artery, and right atrial cannulation for CPB.

While the patient was cooled to 18 °C, ventricular distension occurred. After cross-clamping for a short time, cardioplegia was given, cross-clamp was, then, removed and DHCA was started. The ascending aorta was opened longitudinally where both the left and right coronary arteries separately originated from the right coronary sinus (Figure 1). The dissection flap was originated above the coronary ostium toward the mid ascending aorta. There was a tear in the middle part of the aorta which allowed the false lumen to be supplied from the true lumen. The dissection flap was fenestrated about 1 cm at diameter at the beginning of the aortic arch to maintain the relationship between the false and true lumens.

The aortic tube graft (No: 30) was sewn to the distal aorta with Teflon pledgets using open anastomosis technique. The time of DHCA was 28 minutes. Cerebral perfusion was not used during DHCA. After putting a clamp to the distal part of the graft, re-warming was initiated. The left internal thoracic artery (LITA)-LAD anastomosis was done. The Bentall procedure was also performed with a No 25 mechanical valve conduit. The mechanical valve conduit was sewn to the aortic annulus with Teflon pledget sutures.

The single coronary button arising from the right coronary sinus was anastomosed to the anterior surface of the graft. The tube graft inserted into distal aorta and the valved conduit graft were, then, sewn together. The procedure was completed in a routine fashion.

The patient had an uneventful recovery and was discharged on 10<sup>th</sup> day postoperatively. The patient is still in his first year after surgery and in Class 1 functional capacity.

### DISCUSSION

Limited number of cases with acute aortic dissection can survive and become chronic dissection. The survival in this patient population usually depends on their tolerance ability for acute aortic regurgitation and the absence of malperfusion and rupture. In chronic cases, the blood supply of the organs may depend on the false lumen flow and, therefore, proximal repair is done in a way to sustain this flow. During surgery, we created a fenestration on the false lumen in proximal aortic arch to maintain blood flow to these organs.

A small number of patients with a confirmed diagnosis of chronic dissection should be surgically treated. Indications for surgery in these patients are based on the aortic diameter and the presence of aortic valve insufficiency.<sup>[3]</sup>

Chronic aortic dissection with persistent false lumen may lead to chronic thoracic aneurysms. There has been an increase in the number of patients with chronic dissections requiring treatment of late complications. Although symptoms such as chest pain, dyspnea, fatigue, back pain, and stroke may present, some patients may be asymptomatic. In a recent study with 131 cases (37 chronic and 94 acute), the authors represent that the patients who refused surgery were treated medically with anti-hypertensives to control blood pressure and the heart rate. Overall in-hospital mortality was 34.4% including 42.6% in acute cases and 13.5% in chronic cases.<sup>[4]</sup>

To the best of our knowledge, there is a limited number of cases with coronary anomalies in combination with aortic dissections in the literature. In a recent case report, the Sun's procedure is done to a chronic type 1 dissection case.<sup>[5]</sup> There was also coronary anomaly in which the left and right coronary arteries originated from the left coronary sinus.<sup>[5]</sup>

Recent anatomical classification made by Roberts and Shirani is associated with the distribution pattern and the aortic sinus origin of the coronary artery. Subtypes are defined according to the course of the coronary arteries. Some of coronary artery anomalies have clinical significance and may cause sudden death in young population, in particular.<sup>[6]</sup>

In conclusion, the most effective treatment of chronic type 1 dissection, even in asymptomatic

patients, is surgical intervention. Some of coronary artery anomalies have clinical significance, especially in young people, which they may cause sudden death.

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