

# Acute Inferior Myocardial Infarction in a Patient with Corrected Tetralogy of Fallot with Normal Coronary Arteries

## Normal Koronerlere Sahip Düzeltilmiş Fallot Tetralojisi Olan Vakada Akut Alt Duvar Miyokard İnfarktüsü Gelişmesi

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**ABSTRACT** Patients with Tetralogy of Fallot (TOF) and similar cyanotic congenital heart diseases can survive to late adulthood depending on the advances in surgical procedures. As they get older they become at risk for coronary artery disease as frequently as the general population. Normally, the pathophysiologic mechanism of myocardial infarction (MI) in this group is similar to the general population. Theoretically, acute MI may also be seen in TOF patients. However, within our knowledge, there is no acute MI reported in TOF patients with normal coronary arteries. Here, we wanted to share a case of exception to this.

**Keywords:** Tetralogy of Fallot; acute myocardial infarction; normal coronary arteries

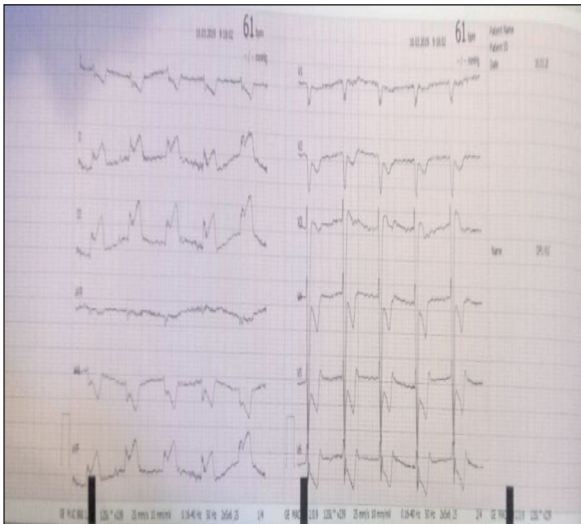
**ÖZET** Fallot Tetralojisi (FT) ve benzeri siyanotik konjenital kalp hastalıklarında gelişmiş cerrahi tekniklerin de etkisiyle geç erişkinliğe kadar hayatta kalabilir. Bu grup hastalarda yaş ilerledikçe ateroskleroz sıklığı normal popülasyonla benzer oranlara ulaşmaktadır. Normalde bu grupta miyokard infarktüsünün (MI) patofizyolojik mekanizması genel popülasyona benzer. Teorik olarak akut MI FT hastalarında da görülebilir. Bilgimiz dahilinde normal koroner arterleri olan FT'li hastalarda akut miyokard infarktüsü hiç bildirilmemiştir. Bu yazıda, bunun bir istisnası olan bir olguyu paylaşmak istedik.

**Anahtar Kelimeler:** Fallot tetralojisi; akut miyokard infarktüsü; normal koroner arterler

**T**etralogy of Fallot (TOF) constitutes approximately 7-10% of congenital heart diseases (CHDs) and is the most common cyanotic CHD with 0.23-0.63 cases per 1,000 births. Thanks to advanced surgical procedures, lifetime is increased in these patients, but they are at greater risk for coronary artery disease as they get older. There are only a few TOF patients with acute myocardial infarction (MI) in the literature. We aimed to share a case with corrected TOF and normal coronary arteries who also had acute inferior MI.

### CASE REPORT

A 59-year-old male who had surgically corrected TOF at the age of 22 and secondary polycythemia with no cardiovascular risk factors was admitted to hospital with squeezing chest pain lasting for 2 hours. His electrocardiogram (ECG) showed persistent ST-segment elevation in inferior leads and reciprocal ST depression in D1, aVL and anterior leads (**Figure 1**). His



**FIGURE 1:** ECG shows obvious ST segment elevation in inferior leads and reciprocal ST segment depression in D1 and aVL and also in anterior leads.

echocardiogram showed no abnormality other than typical postsurgical TOF appearance and akinesia of inferior and posterior walls. His right ventricular function was mildly depressed, and there was only mild pulmonary regurgitation. He was diagnosed as acute inferoposterior MI according to universal definition of MI guidelines.<sup>1</sup> He was quickly transferred to catheterization laboratory, and coronary angiography was performed immediately. His right and left coronary arteries were completely patent, and there was no thrombus formation (Figures 2a, Figure 2b). His control troponin level was extremely high (>27 000), and there was no other factor to cause troponin level elevation or acute ischemic changes in ECG such as pulmonary thromboembolism or acute ischemic cerebrovascular event. He was discharged from the hospital and followed-up uneventfully for 1 month with dual antiplatelet therapy (DAPT) and optimal medical treatment. Informed consent was obtained from the patient.<sup>2</sup>

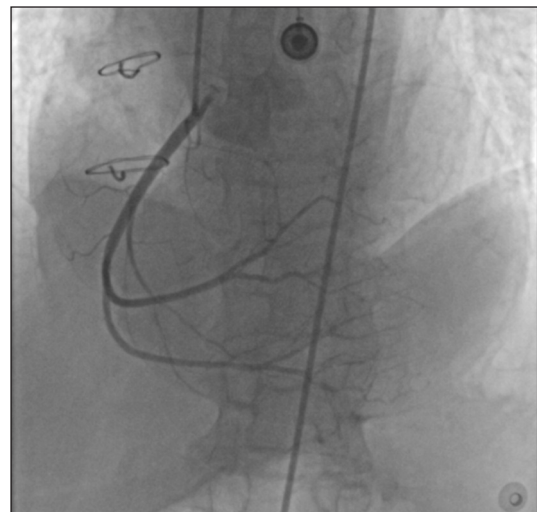
## DISCUSSION

Tetralogy of Fallot is a cyanotic CHD characterized by outlet ventricular septal defect (VSD), overriding of the aorta (>50%), obstruction to right ventricular (RV) outflow and RV hypertrophy. Survival to adult life is rare without palliation and

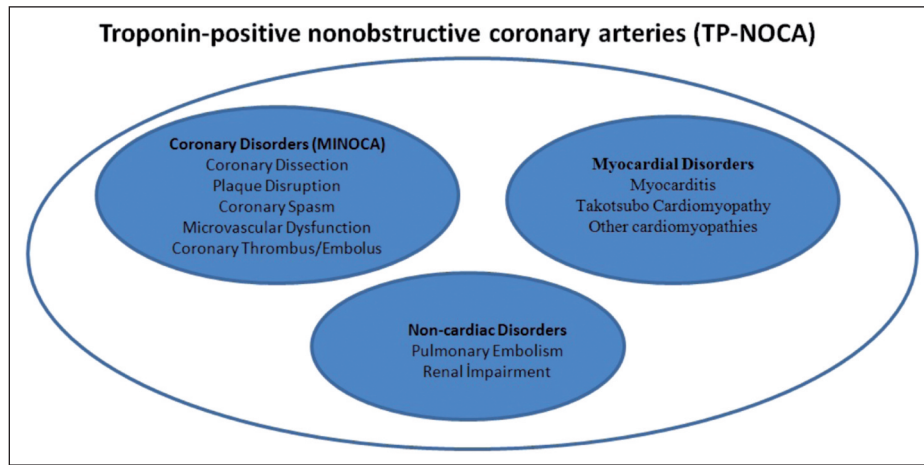
correction.<sup>3</sup> Fortunately, many patients can reach older ages since the first open-heart surgery performed by Lillehei et al. in 1954.<sup>4</sup> Prevalence of atherosclerosis increases with age in the general population and TOF patients. Giannakoulas et al. reported that coronary artery disease (CAD) was present in adult congenital heart disease patients with cardiovascular risk factors such as high blood pressure and high cholesterol.<sup>5</sup> Bradley et al. found the cardiovascular disease prevalence in TOF patients to be similar to the general population (%40 to 36%,  $p=0.3$ ).<sup>6</sup> Akcevin et al. reported successful combined coronary artery bypass surgery with total correction of TOF in a 56-year-old male pa-



**FIGURE 2a:** Left system coronary angiography shows patent left anterior descending and circumflex arteries.



**FIGURE 2b:** Completely patent right coronary artery.



**FIGURE 3:** Troponin-positive nonobstructive coronary arteries.

tient with pink Fallot and multivessel CAD.<sup>7</sup> Although atherosclerosis is still the leading cause of coronary obstruction in the normal population, thromboembolism, erythrocytosis, anomalous coronary anatomy and hyperviscosity syndrome may play a role in acute MI in TOF patients. Besides, coronary vasospasm, coronary thrombosis and emboli, cocaine abuse, aortic dissection and carbon monoxide poisoning may cause acute MI in patients with normal coronary arteries. Myocardial infarction with nonobstructive coronary arteries (MINOCA) is clinically defined by the presence of the universal acute myocardial infarction (AMI) criteria, absence of obstructive coronary artery disease ( $\geq 50\%$  stenosis) and no overt cause for clinical presentation at angiography (e.g., classic features for takotsubo cardiomyopathy) (Figure 3).<sup>8</sup> Differently from the causes, above the coronary vessels of our patient were patent, and no other etiology to cause acute MI was found in detailed evaluation and examination, though, we have not further utilized comprehensive modes of coronary imaging such as coronary angiography via tomography, intravascular ultrasonography etc. Within our knowl-

edge, this is the first case in our country where acute inferior MI occurred in a TOF patient with normal coronary arteries.

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#### **Conflict of Interest**

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.*

#### **Authorship Contributions**

**Idea/Concept:** Fatih Kahraman, Ökkeş Uku; **Design:** Fatih Kahraman; **Control/Supervision:** Fatih Kahraman, Ökkeş Uku; **Data Collection and/or Processing:** Fatih Kahraman; **Analysis and/or Interpretation:** Fatih Kahraman, Ökkeş Uku; **Literature Review:** Fatih Kahraman, Ökkeş Uku; **Writing the Article:** Fatih Kahraman, Ökkeş Uku; **Critical Review:** Fatih Kahraman, Ökkeş Uku; **References and Fundings:** Fatih Kahraman, Ökkeş Uku; **Materials:** Fatih Kahraman, Ökkeş Uku.

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