

Management of a Patient with a Single Coronary Artery Anomaly During the Heart Attack

Oya güven, Dilay Satılmış
Sağlık Bilimleri Üniversitesi Sultan Abdülhamid Han Eğitim ve Araştırma Hastanesi

Abstract

The presence of coronary arteries originating from the single coronary orifice is a rare congenital anomaly. In case of obstruction, the whole heart's nutrition is disrupted and diagnosis, intervention, and treatment are important as there is a risk of encountering high-risk clinical conditions, especially sudden cardiac death at a young age. In this article, we present a patient with coronary artery anomaly originating from a single coronary orifice and presenting to the emergency department with angina.

Keywords: Coronary artery anomaly, single coronary artery, angina, emergency medicine

Introduction

The right coronary artery (RCA) and the left coronary artery (LMCA) originate from the right and left sinus Valsalva of the aortic root. The right coronary artery (RCA) is an artery that flows blood to the right atrium, right ventricle, and left ventricular posterior wall. The left coronary artery (LMCA) is an artery located in the left half of the posterior part of the pulmonary trunk and separated from the left anterior descending artery (LAD) and the left circumflex artery (LCx), and the right coronary artery originates at a lower level than the origin of the left coronary artery.

The term single coronary artery is a congenital anomaly in which both the right and left coronary arteries originate from a single ostium in the aorta and feed the whole heart, and its incidence has been reported to be between 0.02-0.04% in various angiographic series¹.

Patients with coronary artery anomalies may also present a wide range of symptoms from chest pain to sudden death. These varying symptoms are depending on the affected area of the heart, usually asymptomatic until congestion, and are responsible for approximately 20% of sudden deaths in young athletes.

For this reason, it should be considered and well known by all physicians who are interested in coronary artery anomalies in order to make correct diagnosis and treatment decisions and to avoid problems that may occur during coronary interventions².

In this study, we aimed to draw attention to the management of a case with coronary artery anomaly originating from

a single coronary orifice which is detected in coronary angiography of a case who apply to the emergency room with typical chest pain and positive electrocardiogram changes.

Case Presentation

A 68-year-old male patient applied to our emergency room with complaints of chest pain that started 1-2 hours ago. He had a history of diabetes and hypertension. On arrival examination, the general condition was good, cooperative, orientated and sudden onset of chest anterior wall pain was described. In the physical test performed in the emergency room; blood pressure was 180/80 mmHg, pulse: 100/minute, there was minimal ral in bilateral lower zones of thorax, Electrocardiography showed that ST-segment depression in leads D2-D3-AVF and V2-V6 (Figure 1). All other systemic examinations were normal. Acetylsalicylic acid 300 mg (oral), heparin 5000 units (intravenous), ticagrelor 180 mg (oral) were administered in the emergency room and immediate coronary angiography was planned. Coronary angiography (Figure 2) revealed a left main coronary artery (LMCA), a left descending artery (LAD), a circumflex artery (Cx), and a right coronary artery (RCA), which was rarely seen that emerged from a single orifice (originating from the right coronary artery). A stent was applied to the obstructed RCA. No additional congenital anomaly was detected and the patient was discharged with medical treatment.

Discussion and Conclusion

In a study performed by Yıldız et al. about coronary artery anomaly cases, out of 12457 patient's angiography reports, only 2 (0.016%) had coronary arteries originating from a single coronary artery³. In an angiography study of 10239 patients performed by Çilingiroğlu, only 2 patients (0.01%) were detected⁴. In both studies, coronary arteries originated from the right coronary sinus in coronary angiography reports. In our case, the coronary arteries originated from the right coronary sinus as in these studies.

In postmortem studies, Nethan et al. found this anomaly in 3 cases out of 216 patients. In this study, the coronary arteries originated from the left coronary sinus⁵.

In the study of Taylor et al., 44 patients had a single coronary artery among 256 patients with a congenital anomaly. It has been observed that the risk of sudden death is greater when a single coronary artery originates from the right coronary sinus⁶.

In our case, all coronary arteries originated from a single coronary sinus (right coronary sinus). This is very rare in the literature. There are two possibilities for single coronary sinus anomaly; the arteries of the opposite side may leave this main coronary artery after hatching and go to their irrigation area or this artery will circulate the whole heart and blood. There are two types of risk in this anomaly. First, when a single coronary artery emerges from the aorta, the blood supply of the whole heart is disrupted at the same time in the stenosis on this root⁷. The second is a risk of sudden death, if the coronary artery from the opposite side passes between the aorta and the pulmonary artery while passing into its irrigation area⁸.

As a result, "coronary artery originating from a single coronary orifice" anomaly causes symptoms like other coronary artery diseases and the same treatment protocols are

applied. However, although they are rare anomalies, they should be planned carefully because they cause life-threatening conditions. We believe that effective management of the cases should be experienced in large centers where coronary angiography is performed frequently, especially in order to make the correct diagnosis, treatment decisions, and avoid the problems that may arise during the coronary angiography procedure and surgical intervention.

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