

# Journal of Surgery and Medicine

e-ISSN: 2602-2079

## Surgically managed gunshot injury of the heart; Bullet in the right coronary artery

### Kalbin ateşli silah yaralanmasında cerrahi yönetim; Sağ koroner arterde kurşun

Özgür Altınbaş<sup>1</sup>, Ömer Tanyeli<sup>2</sup>

<sup>1</sup> Konya Training and Research Hospital,  
Department of Cardiovascular Surgery,  
Konya, Turkey

<sup>2</sup> Necmettin Erbakan University, Meram  
Medical Faculty, Department of  
Cardiovascular Surgery, Konya, Turkey

#### Abstract

Gunshot injuries are one of the penetrating traumas of the heart and that require urgent intervention. Localization of the cardiac injury is important in terms of appropriate treatment approach. For this reason, rapid diagnosis and surgical intervention is life-saving in such patients. In our study, we present a surgical intervention of a patient with lesion on the right coronary artery that doesn't allow blood flow in coronary angiography due to cardiac injury with gunshot injury.

**Keywords:** Gunshot injury, Cardiac trauma, Surgery

#### Öz

Ateşli silah yaralanmaları, kalbin penetran travmalarından biridir ve acil müdahale gerektirmektedir. Kardiyak hasarın lokalizasyonu uygun tedavi yaklaşımı açısından önemlidir. Bu sebeple bu hastalarda hızlı tanı ve cerrahi müdahale hayat kurtarıcıdır. Çalışmamızda ateşli silah yaralanmasına bağlı kardiyak yaralanma nedeniyle koroner anjiyografide kan akışına izin vermeyen sağ koroner arter lezyon olan bir hastanın cerrahi müdahalesini sunduk.

**Anahtar kelimeler:** Ateşli silah yaralanması, Kardiyak travma, Cerrahi

#### Introduction

Penetrating cardiac traumas are rarely seen and life-threatening clinical situations. Rapid and correct diagnose and intervention are important. Although prognosis and outcome is often not good in cardiac gunshot injuries, here we presented a successful surgical management of right coronary injury due to gunshot.

#### Case presentation

A 42-year-old man was transferred our hospital with multiple penetrating wounds from a shotgun. The patient was conscious at the time of admission and physical examination revealed multiple pellet injuries in the skull, face, chest, abdomen and upper and lower extremities. The electrocardiogram showed changes indicating an acute inferior wall myocardial infarction. Multiple pellets in the chest and abdomen, including one in the heart was seen in CT images. Two-dimensional echocardiography showed minimally pericardial effusion near lateral wall. Emergent coronary angiography was performed to the patient and it was seen that there was a complete occlusion of the distal right coronary artery with a pellet embedded in the heart (Figure 1).

As the worsening of the vital signs urgent operation was decided. Aorto-right coronary bypass with saphenous vein was done. Bullet was untouched because for being deeply settled and the patient was discharged from hospital postoperatively 12th day without any cardiac problem.

Corresponding author / Sorumlu yazar:  
Özgür Altınbaş

Address / Adres: Konya Eğitim ve Araştırma  
Hastanesi, Kardiyovasküler Cerrahi Kliniği,  
Konya, Türkiye  
e-Mail: ozgur\_altinbas@yahoo.com

Informed Consent: The author stated that the  
written consent was obtained from the patient  
presented in the study.

Hasta Onamı: Yazar çalışmada sunulan hastadan  
yazılı onam alındığını ifade etmiştir.

Conflict of Interest: No conflict of interest was  
declared by the authors.

Çıkar Çatışması: Yazarlar çıkar çatışması  
bildirmemişlerdir.

Financial Disclosure: The authors declared that  
this study has received no financial support.  
Finansal Destek: Yazarlar bu çalışma için finansal  
destek almadıklarını beyan etmişlerdir.

Previous presentation: This study was orally  
presented in 66th International Congress of the  
European Society for Cardiovascular and  
Endovascular Surgery, 11-14 May, 2017  
Thessaloniki, Greece

Received / Geliş tarihi: 20.03.2018  
Accepted / Kabul tarihi: 12.04.2018  
Published / Yayın tarihi: 12.04.2018

Copyright © 2018 The Author(s)  
Published by JOSAM

This is an open access article distributed under the terms of the Creative  
Commons Attribution-NonCommercial-NoDerivatives License 4.0 (CC  
BY-NC-ND 4.0) where it is permissible to download, share, remix,  
transform, and buildup the work provided it is properly cited. The work  
cannot be used commercially without permission from the journal.



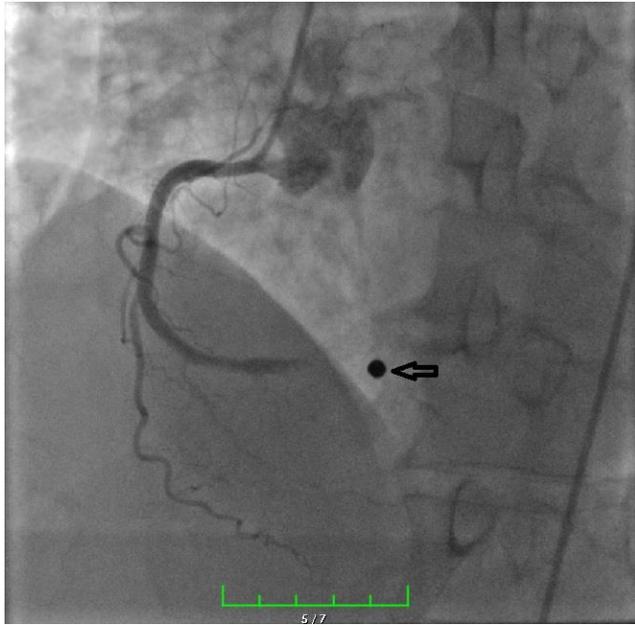


Figure 1: A foreign material caused total occlusion of right coronary artery in coronary angiography

## Discussion

Traumas result to cardiac injury can be classified as penetrating and nonpenetrating. Penetrating cardiac trauma is rarely seen and intravascular and intracardiac bullets are a diagnostic and therapeutic challenge. Myocardial rupture, contusion, laceration, pericardial insult, coronary injury, valvular damage, arrhythmias and conduction abnormalities can be seen after these traumas. Stab or gunshot wounds are the most frequent penetrating injuries [1]. Penetrating injury to the heart may result in intracardiac injury in different sites; the right ventricle is the most common (43%), followed by the left ventricle (33%), right atrium (15%), left atrium (6%) and intrapericardial great vessels (6%) [2].

Similarly in our case, various case studies reveal that trauma is one of the nonatherosclerotic factors associated with acute myocardial infarction [3]. Although there are few reports related to a gunshot injury to a coronary artery managed conservatively that ended with a favorable outcome, our patient had total occlusion of the right coronary artery, caused complicated inferior myocardial infarction, needed to surgery [4].

Although penetrating cardiac traumas are rarely seen, there is a short time lag to keep the patients alive [5]. Approximately 80-90% of the patients with gunshot wounds of the heart cannot be reached to the hospital [6]. Wall et al reported the hospital mortality of complex cardiac injuries (coronary, septal, valvular) up to 53% [7]. The most common causes of mortality are cardiac tamponade or bleeding [1].

Management decision depends on the cardiac chamber involved, the patients' symptoms and the projectile's size, shape and location within the chamber [8]. Small pericardial and myocardial wounds with tamponade can be treated by pericardiocentesis, but larger wounds of the pericardium and myocardium due to the bullets should be managed by thoracotomy and sternotomy [6].

Cardiac foreign bodies are challenging clinical entities with varied manifestations that all surgeons should be aware of

so, acute operations for complex injuries are important and necessity for saving lives.

## References

1. Bali HK, Vijayvergia R, Banarjee S, Kumar N. Gunshot Injury of the Heart: An Unusual Cause of Acute Myocardial Infarction. *Tex Heart Inst J*. 2003;30(2):158-60.
2. Kumar S, Moorthy N, Kapoor A, Sinha N. Gunshot Wounds Causing Myocardial Infarction, Delayed Ventricular Septal Defect, and Congestive Heart Failure. *Tex Heart Inst J* 2012;39(1):129-32.
3. Chun JH, Lee SC, Gwon HC, Lee SH, Hong KP, Seo JD, Lee WR. Left main coronary artery dissection after blunt chest trauma presented as acute anterior myocardial infarction: assessment by intravascular ultrasound: a case report. *J Korean Med Sci*. 1998;13(3):325-7.
4. Dawson J, Rodriguez Y, Pham SM, Ferreira A. Traumatic transection of the left anterior descending artery caused by a projectile. *Journal of Cardiology Cases*. 2012;5(3):140-2.
5. Kaya A, Caliskan E, Tatlisu MA, Hayiroglu MI, Tekkesin AI, Cakilli Y, et al. A Retained Bullet in Pericardial Sac: Penetrating Gunshot Injury of the Heart. *Case Rep Cardiol*. 2016;2016:2427681.
6. Wani ML, Ahangar AG, Wani SN, Irshad I, Ul-Hassan N. Penetrating Cardiac Injury: A Review. *Trauma Mon*. 2012;17(1):230-2.
7. Wall M J Jr, Mattox KL, Chen CD, Baldwin JC. Acute Management of Complex Cardiac Injuries. *J Trauma*. 1997;42(5):905-12.
8. Galante J, London JA. Left Ventricular Bullet Embolus: A Case Report and Review of the Literature. *J Emerg Med*. 2010;39(1):25-31.