The medical approaching to a pellet injury of the heart

M.A. ELBEEY, C. YAVUZ*, H. CIL, Y. ISLAMOGLU

Department of Cardiology, School of Medicine, Dicle University, Diyarbakir (Turkey)
*Dicle University, Faculty of Medicine, Department of Cardiovascular Surgery, Diyarbakir (Turkey)

Abstract. – A 55-year-old man with multiple pellet injuries was brought to the Emergency room. In his physical examination, there were multiple wounds in face, neck, shoulders, arms, thorax and upper abdomen. The therapeutic options include pericardial drainage, conservative treatment, and surgical removal of the pellet. But, he was successfully managed with conservative medical treatment. This case showed that the treatment of heart injuries due to shotgun pellet should be individualized.

Key Words: Echocardiography, Gunshot pellets, Heart injury.

Introduction

Cardiac trauma can be caused by either penetrating or nonpenetrating injuries. The penetrating injuries most frequently seen are stab or gunshot wounds. Common cardiac results of such injuries, which are including myocardial contusion, laceration, rupture, pericardial and coronary injury, valvular damage, conduction abnormalities and arrhythmias. Echocardiography may be employed to assess patients with penetrating chest trauma when cardiac involvement is suspected. It has been shown to reduce the time to surgical intervention, and thus reduce the mortality risk. In this case, we describe a patient who received a gunshot wound to his heart.

Case Report

A 55-year-old man with multiple pellet injuries was brought to the Emergency room. He was wounded with a firearm from approximately 30 meters distance. His vital signs were as follows: blood pressure, 110/70 mmHg; pulse rate, 100 beats/min, and respiratory rate 18/min. The physical examination revealed multiple wounds caused by shotgun pellets in the face, neck, shoulders, arms, thorax and upper abdomen. There were no exit wounds.

One of pellet entrances was 0.5 cm in diameter on sternum. The lung examination showed decreased breath sounds in the left lung base. Results of the heart examination were normal except for the rapid rate. There was no jugular venous distention. He was hemodynamically stable.

The electrocardiogram showed sinus rhythm with no other alterations. Chest radiography showed multiple pellets in the chest, including one in the cardiac silhouette (Figure 1). Two-dimensional transthoracic echocardiography showed an echogenic density in anterior wall of right ventricle (RV) with intense reverberations (Figure 2). The echogenicity is most likely the pellet that punctured to the chest wall and continued inward to lodge in the right ventricular wall. The atrioventricular valves and biventricular functions appear normal. There was no regurgitation, regional wall motion abnormalities, and pericardial effusion. A computed tomographic (CT) scan of the chest confirmed the presence of a cardiac foreign body in right ventricular anterior wall (Figure 3). He was managed with conservative medical treatment. At the 2-weeks follow-up, he was asymptomatic and his control echocardiographies were normal. The patient was discharged at 15 days. At 3 months, there was no increase in pericardial effusion and any symptoms. He will continue to receive ongoing follow-up to assess for late complications (erosion, conduction, migration, disturbance, etc.).

Discussion

The clinical presentation of a penetrating cardiac injury depends on several factors, such as
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Size of the wound, type of object, structures damaged, the presence of pericardial tamponade, and associated noncardiac injuries. Various complications, such as laceration of the coronary artery, hemopericardium, coronary arteriovenous fistula, cardiac perforation, and pellet embolization, have been reported after pellet injury\(^1,4,5\). Cardiac wounds due to shotgun pellets are often, but there is no standard treatment protocol in clinical practice\(^6,7\).

Surgical examination and excision should be considered, if arrhythmias, heart failure, ventricular septal defect or cardiac tamponade occur. The case, shotgun pellets in the myocardium clinically and hemodynamically well-tolerated was reported before\(^8\).

The therapeutic options for this situation include pericardial drainage, conservative treatment, and surgical removal of the pellet\(^9\). We describe an adult with a firearm-related cardiac injury in which a shotgun pellet became lodged in the right ventricular anterior wall and was treated using a conservative approach.

Cardiothoracic injury causes 25% of deaths immediately following trauma and the majority of these fatalities involve cardiac or great vessel injury\(^10\). In our case, hemodynamic and respiratory variables remained stable, with no cardiovascular symptoms throughout hospitalization and there were no arrhythmias and any signs or symptoms of heart failure, conservative treatment was undertaken.

In shotgun pellet cardiac injuries, outcome may depend upon multiple factors including clinical status at arrival, time interval till management, nature of injury, and associated injuries. This case showed us that each patient's treatment should be individualized in cardiac pellet injury.
References


