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Venous bullet embolism to the right ventricle: Case report

Abstract

It is extremely rare for venous-injured gunshot wounds to cause cardiac embolism. Removal of cardiac embolism is essential in these patients. But there are also cases where it is not possible to remove the pellet for various reasons. In this case report, we aimed to present a case that we followed without removing pellets that did not damage important heart structures.

Keywords: Gunshot, embolism, vascular injury

INTRODUCTION

Intravascular bullet embolism to the heart after a firearm is a very rare, and it can lead to life-threatening complications and death (1,2). Although 10% of patients with gunshot wounds close to peripheral vessels have arterial injury, intravascular bullet embolism is rare. Usually, there are no specific symptoms or signs of bullet migration. Therefore, the bullet can be easily undiagnosed. We present a case of bullet migration to the heart from pelvis vessels.

CASE REPORT

A 24-year-old male patient was admitted to our hospital with a rifle wound to the right posterior pelvis and knee region. The patient's blood pressure was 120/90 mmHg, heart rate was 96 beats/min, and respiratory rate was 16 breaths/min. All vital signs were stable. There were no wounds or shot entry/exit sites in the chest and upper abdomen. The right posterior pelvis and the lateral aspect of the right posterior knee region had multiple rifle pellet entry sites. The skin adjacent to the entry sites was red and swollen, but there was no active bleeding. Electrocardiography and upper abdominal/chest radiographs appeared normal. X-ray

of the pelvis and right thigh showed multiple spherical metal silhouettes approximately 3 mm in diameter (Figure 1).



Figure 1. Multiple spherical metal pellet silhouette views on pelvis and right thigh

The patient with stable vital signs and no active bleeding was hospitalized for control purposes. The patient's findings were

stable in the first day of follow-up. In the control posteroanterior chest X-ray radiograph taken 24 hours later, a silhouette of a metal object with a diameter of approximately 3 mm, which was not found in previous chest radiographs, was seen. On chest tomography (CT), a metal object with a diameter of 3x3 mm was detected in the right ventricle between the trabecular muscles under the sepal leaflet (Figure 2).



Figure 2. Silhouette of the pellet in the right ventricle

Echocardiography showed that an immobile metal body located under the septal leaf of the tricuspid valve in the right ventricle did not affect valve function. Our cardiology department reported that it is not possible to remove the metal mass percutaneously. Our cardiac team recommended the patient to surgically remove the metal mass in the right ventricle due to concerns about possible embolism. However, the patient did not accept this procedure. Regular examinations and CT of the patient were obtained, and all vital signs were stable.

The next day's CT showed a new pellet with a diameter of 3 mm located peripherally in the lower lobe of right lung, in addition to the pellet in the trabecular muscles under the right ventricular septum leaf (Figure 3). Confirmation by ECHO that the pellet in the right ventricle was fixed in place the previous day suggested that the pellet in the lung was a new embolism. Since there was right ventricular and pulmonary embolism, prophylactic anticoagulant prophylaxis for 12 months was planned. Considering the patient's pelvic injuries, subcutaneous enoxaparin sodium 40 mg was started twice a day for the first days. During the hospital follow-up, no increase in bleeding was observed in pelvic injuries. The patient was discharged with warfarin sodium. Endocarditis prophylaxis was performed with first generation cephalosporin and aminoglycoside for first 48 hours.

No new embolism was detected in the follow-up. The hospital period was uneventful. Then patient was discharged on the 7th day. In the control CT and echo performed on the 15th day, 3rd month, and 6th month of the follow-up, it was observed that the pellets were stable and the patient had no additional complaints.

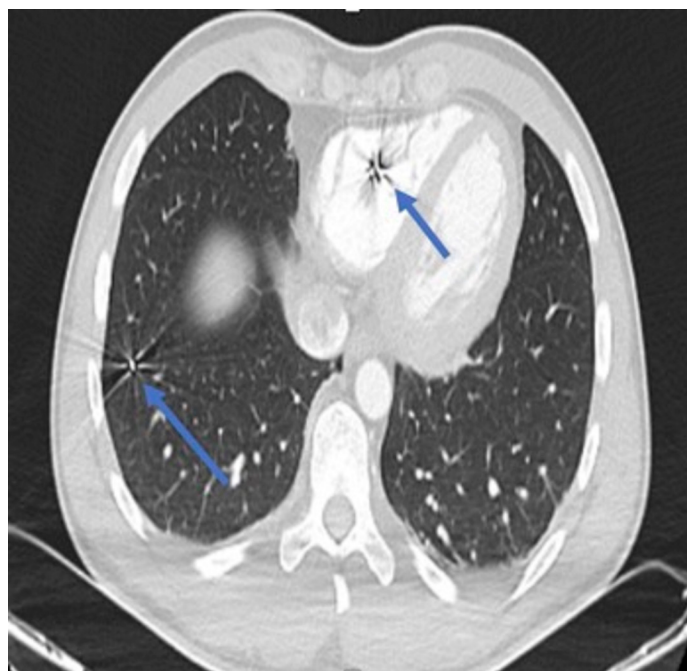


Figure 3. Silhouette of the pellet in the right ventricle and right lung lower lobe

DISCUSSION

Intravascular bullet embolism to the heart after a firearm is a very rare condition, and it is reported in the literature at a rate of 0.3% (3). It is more common in the younger age group. Because the venous vein wall is thinner, cardiac embolism is more common in venous injuries than in arterial injuries (4,5). Our case is 24 years old and caused right ventricular and pulmonary embolism as a result of lead pelvic venous injury.

The diagnosis can be made easily by seeing the silhouette of the bullet in the chest X-ray taken after a gunshot injury, but it should be kept in mind that there may be a bullet embolism later, especially in cases with venous injuries. Tamponade, bleeding, valve dysfunction, and intra-cardiac shunts are the most common acute clinical manifestations of retained cardiac missiles. Late signs include pulmonary embolus, endocarditis, dysrhythmia, and pericarditis. Endomyocardial trabeculations of the right heart chamber can capture missiles, which are then covered with fibrous tissue (6,7).

For right-heart and pulmonary vascular foreign bodies, 12 months of prophylactic anticoagulation and 48 hours of endocarditis prophylaxis are recommended (8,9). No signs of endocarditis or new embolism were found in our case. Lead toxicity may be considered, however, it has been reported that bullet tracking

with cardiac or vascular bullets does not occur lead toxicity except with exposure to synovial fluid or bone marrow (10).

Intracardiac bullet embolisms can be removed endovascularly, but the location of the bullet in the heart is important (11). Our case was not in a suitable location for endovascular excision. Since it was not accepted by the patient, it could not be surgically removed and a follow-up decision was made. There are studies reporting that pellet cases that are immobile and stable in the heart and are not close to important structures such as the coronary artery and conduction system can be followed. (12).

CONCLUSION

In conclusion, the case we presented is important in terms of showing that embolism can develop in gunshot wounds accompanied by peripheral venous injuries.

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REFERENCES

1. Hink AB, Bonne S, Levy M, et al. Firearm injury research and epidemiology: A review of the data, their limitations, and how trauma centers can improve firearm injury research. *J Trauma Acute Care Surg.* 2019;87:678-89.
2. Richardson EG, Hemenway D. Homicide, suicide, and unintentional firearm fatality: comparing the United States with other high-income countries, 2003. *J Trauma.* 2011;70:238-43.
3. Rich NM, Collins GJ Jr, Andersen CA, et al. Missile emboli. *J Trauma.* 1978;18:236-9.
4. Lu K, Gandhi S, Qureshi MA, et al. Approach to Management of Intravascular Missile Emboli: Review of the Literature and Case Report. *West J Emerg Med.* 2015;16:489-96.
5. Shannon FL, McCroskey BL, Moore EE, Moore FA. Venous bullet embolism: rationale for mandatory extraction. *J Trauma.* 1987;27:1118-22.
6. Symbas PN, Picone AL, Hatcher CR, Vlasits-Hale SE. Cardiac missiles. A review of the literature and personal experience. *Ann Surg.* 1990;211:639-47;discussion 647-8.
7. Lundy JB, Johnson EK, Seery JM, et al. Conservative management of retained cardiac missiles: case report and literature review. *J Surg Educ.* 2009;66:228-35.
8. Schroeder ME, Pryor HI 2nd, Chun AK, et al. Retrograde migration and endovascular retrieval of a venous bullet embolus. *J Vasc Surg.* 2011;53:1113-5.
9. Santucci RA, Chang YJ. Ballistics for physicians: myths about wound ballistics and gunshot injuries. *J Urol.* 2004;171:1408-14.
10. Pollak S, Ropohl D, Bohnert M. Pellet embolization to the right atrium following double shotgun injury. *Forensic Sci Int.* 1999;99:61-9.
11. Charniot JC, Cluzel P, Leprince P, Demondion P. Percutaneous Transjugular Extraction of Venous Bullet Embolism to the Right Ventricle. *Ann Thorac Surg.* 2018;106:281-3.
12. Henderson L, Wachsman A, Chikwe J, Esmailian F. Venous bullet embolism to the right ventricle: Case report and review of management. *Clin Case Rep.* 2020;9:917-21.