An Unusual Case of Birdshot Embolism

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There are numerous cases of arterial and venous bullet embolism to the heart. An unusual case of birdshot embolus to the right ventricle from the femoral vein caused diagnostic confusion. Distant migration of the foreign bodies via blood vessels has to be taken into consideration after gunshot wounds. (*Circ J* 2002; 66: 707–708)

Key Words: Birdshot; Embolism; Heart

Embolization to the right ventricle after a gunshot wound is exceptional^{1,2} and although foreign bodies, such as bullets, have been the cause of embolization,^{1–4} we have not seen any previous reports of birdshot emboli. We report an unusual case of birdshot emboli to the right ventricle from the femoral vein.

Case Report

A 32-year-old man sustained an injury to the right inguinal region from a distance of about 2 m after simultaneous discharge of a pump-action shotgun. The lead pellets were No.8, which corresponds to diameter of 2.28 mm. There were multiple entrance holes in the inguinal region with tissue destruction involving an area of 15×15 cm in diameter (Fig 1). He was in hypovolemic shock from severe bleeding and underwent emergency surgery. Exploration revealed multiple holes as well as tissue destruction of both the artery and vein. Continuity of these vessels was restored by interposition of autogenously contra lateral saphenous vein graft to the femoral vein and a Gore-Tex graft to the femoral artery. The short and bifurcated saphenous vein could not be used as an arterial autograft because its length was sufficient only for venous bypass.

The patient survived and had a good clinical course. No complications occurred, although a few birdshot pellets remained free in the abdominal cavity. In the postoperative chest X-ray, there was a suspicious metallic foreign body projecting from the inferior vena cava and right atrium, requiring further investigation. Birdshot was localized in the right ventricle (RV) by fluoroscopy first and then confirmed to be located in the intersection of the septum and free wall at the inlet of the RV by multi-planar reconstruction tomography (Fig 2). Echocardiographic evaluation was equivocal in demonstrating the exact location of the birdshot.

We speculated that the birdshot migrated to the heart through the inferior vena cava after entering the femoral vein, with subsequent embolization to the RV. Because it did not move at all during the clinical course, no surgical intervention was indicated. The patient received oral anti-coagulants and his clinical and hemodynamic condition

remained stable. No further movement of the birdshot was observed during the follow-up period of 9 months.

Discussion

A shotgun consists of one or more metal barrels of wide diameter. The type known as ‘birdshot’ is the smallest one with 1.27 (No.12) and 4.06 (No.1) mm, and those using buckshot or bullets are bigger.

Various non-invasive or invasive procedures may be required to localize birdshot emboli in the heart.^{1,2} In the present case, after suspicious chest X-ray findings, the

Fig 1. X-ray of pelvic region shows multiple birdshot pellets.

Fig 2. Axial image clearly demonstrates birdshot in the right ventricle.

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exact location and the diagnosis were confirmed with fluoroscopy and multi-planar reconstruction tomography.

Therapeutic approaches, including medical therapy, embolectomy and surgery, have been described with different results.^{1,4} Surgical removal of the foreign body, even if it is small, is recommended in symptomatic and complicated cases^{1,2} such as repeated pulmonary embolism and intractable infection. Medical management and follow up should be considered in asymptomatic patients such as the present case.

In conclusion, birdshot embolization through the venous system can cause diagnostic confusion. Distant migration of the foreign bodies via blood vessels has to be taken into

consideration after gunshot wounds. We must also emphasize that these types of events may lead to legal processes.

References

1. Grewal KS, Sintek CF, Jorgensen MB. Bullet embolism to the heart. *Am Heart J* 1997; **133**: 468–470.
2. Howanitz EP, Murray KD, Galbraith TA, Myerowitz PD. Peripheral venous bullet embolization to the heart: Case report and review of the literature. *J Vasc Surg* 1988; **8**: 55–58.
3. Kaushik VS, Mandal AK. Non-surgical retrieval of a bullet embolus from the right heart. *Catheter Cardiovasc Interv* 1999; **47**: 55–57.
4. Nagy KK, Massad M, Fildes J, Reyes H. Missile embolization revisited: A rationale for selective management. *Am Surg* 1994; **60**: 975–979.