A lucky cardiac shotgun?

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A 34-year-old woman was admitted to our institution after attempted murder with a pellet shotgun. At arrival, the patient was haemodynamically unstable with many wounds in the anterior region of thorax, legs, and arms due to pellets. Computed tomography detected numerous foreign bodies in subcutaneous cellular tissue, thorax wall, prosthetic breast, lungs, liver, right arm, and proximal left thigh; one of them was sited in the interventricular septum with minimal pericardial effusion (Figure 1).

The patient suffered from multiple acute complications after admission; right haemothorax and pneumothorax treated with drainage, liver laceration, bone and muscle mass loss, and serious right arm and left leg vascular damage with acute ischaemia. No femoral and axilar nerves were directly affected.

Transthoracic and transoesophageal echocardiography ruled out an interventricular shunt and confirmed minimal cardiac involvement without another acute cardiac complication (Figures 2 and 3 and Supplementary data online, Videos S1, S2, and S3). Troponin-I showed a two-fold rise of upper normal limit in our laboratory, without another signs of myocardial ischaemia. This information was very useful before vascular damage treatment.

Hypovolaemia due to haemorrhage required expansion of the intravascular volume by fluid administration, including blood products, before urgent femoro-femoral and humero-radial by-pass grafting to treat vascular damage. Following surgery, ischaemia symptoms were no longer present. However, no intervention for cardiac injury was necessary.

Nine months after discharge, even with persistence of the foreign body in the interventricular septum, she was completely asymptomatic (Figures 4 and 5 and Supplementary data online, Videos S4 and S5).

This report illustrates an extremely rare situation due to penetrating firearm pellets, in which surgery is usually necessary for repairing major cardiac complications like heart failure related with valve and coronary damage, tamponad, ventricular septal defect, arrhythmias, or embolic phenomena.1,2,3 Transthoracic and transesophageal echocardiography (TEE) were very useful in assessing cardiac involvement before vascular surgery and changed the

Figure 1 Computed tomography (CT) with multiple pellets in thorax and right arm. One of them is located in the interventricular septum (black arrow).

Figure 2 Transthoracic echocardiography (TTE) after admission; subcostal view of a foreign body in the interventricular septum (white arrow).

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surgical approach. Although computed tomography locates projectiles with accuracy, transthoracic echocardiography (TTE) is able to assess haemodynamic impact in cardiac function and is widely available. Unlike TTE, TEE is not always available and requires trained staff, but provides an adequate echocardiographic window, particularly in patients with chest trauma. It is superior to TTE in the exhaustive assessment of locating cardiac foreign bodies, especially in the right and posterior regions of the heart, as well as in investigating the proximal and distal aorta.4,5,6 Echocardiogram must be performed specially in patients with suspicions of cardiac injury.7

This is one of the first cases published in the international literature with successful conservative cardiac management and no complications at 9-month follow-up.8 Because of the fact that wounds due to pellets have an enormous variability and multiple locations, diagnosis must be accurate and treatment for each patient must be individualized, without ruling out conservative management in some cases.

**Supplementary data**

Supplementary data are available at *European Journal of Echocardiography* online.

**References**