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IMAGES IN INTERVENTION

Percutaneous Removal of a Bullet From the Right Ventricle

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A 36-year-old man was referred to our institution from a regional trauma center for management of a migratory bullet within the right ventricle. The patient sustained a gunshot wound to the abdomen. Upon arrival to the referring trauma center, he was taken for emergent exploratory laparotomy with repair of the left ureter and left external iliac vein and a small bowel resection. On follow-up radiography (**Figure 1A**), it was noted that a large bullet fragment had entered the venous vasculature and migrated to the right heart.

Chest computed tomography and transthoracic echocardiography demonstrated that the fragment was positioned along the lateral right ventricular wall, under the tricuspid annulus, but imaging was of limited quality because of significant artifact (**Figure 1B**, transthoracic echocardiography not included). Cardiac surgery and interventional cardiology were consulted, and a decision was made to proceed with percutaneous retrieval, using a simplified version of techniques previously described at our institution for intracardiac mass extraction.[1]

The procedure was performed under general anesthesia with transesophageal echocardiographic guidance.[2] On transesophageal echocardiography, the bullet was identified under the posterior leaflet of the tricuspid valve, near the anterior/posterior commissure (**Figure 2**). A 26-F sheath was introduced to the right femoral vein, through which a 13.8-F internal diameter Passport steerable sheath (Baylis) was advanced into the right atrium. The ÔNÔ endovascular retrieval (ÔNÔCOR Vascular) system was inserted through the steerable guide, with a 6-F internal mammary artery guide catheter within. A 25-mm single-loop snare was used to capture the bullet using transesophageal echocardiographic confirmation. The fragment was then guided away from the subvalvular apparatus, centralized in the valve, and pulled into the ÔNÔ in the right atrium (**Figure 3**). The entire system was then slowly withdrawn from the heart and to the orifice of the sheath. The bullet was too large to enter the sheath, and thus all equipment was removed en bloc with a buddy wire to maintain vessel access. Minor dissection of the soft tissues was required to free the bullet, which was successful (**Figure 4**), and the venotomy was closed with Perclose (Abbott Laboratories) sutures. There were no complications, and transesophageal echocardiography showed new mild tricuspid regurgitation.

To our knowledge, this is the first report of transfemoral extraction of an embolized, intracardiac bullet using the ÔNÔ device, which appears to be a safe and effective management pathway.

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Dr Elison has equity in Excision Medical. Dr Chung has received consulting fees from Boston Scientific, Edwards Lifesciences, and Medtronic. Dr Sheu has reported that he has no relationships relevant to the contents of this paper to disclose.

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The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

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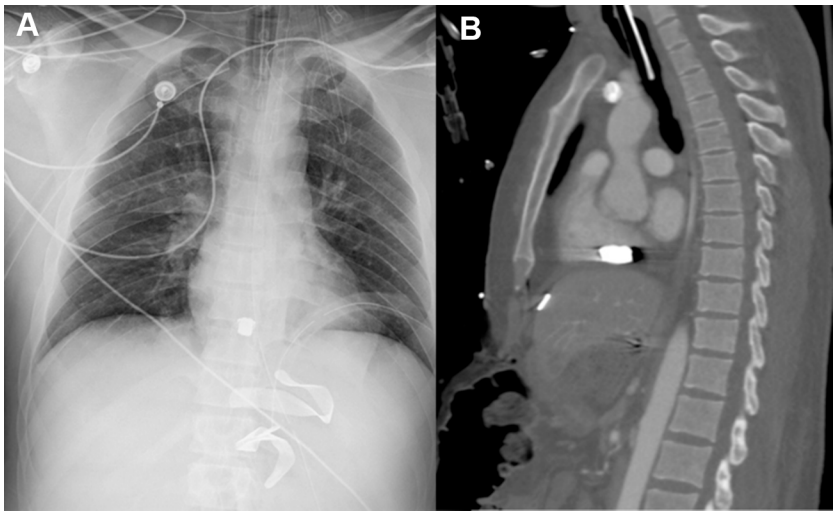
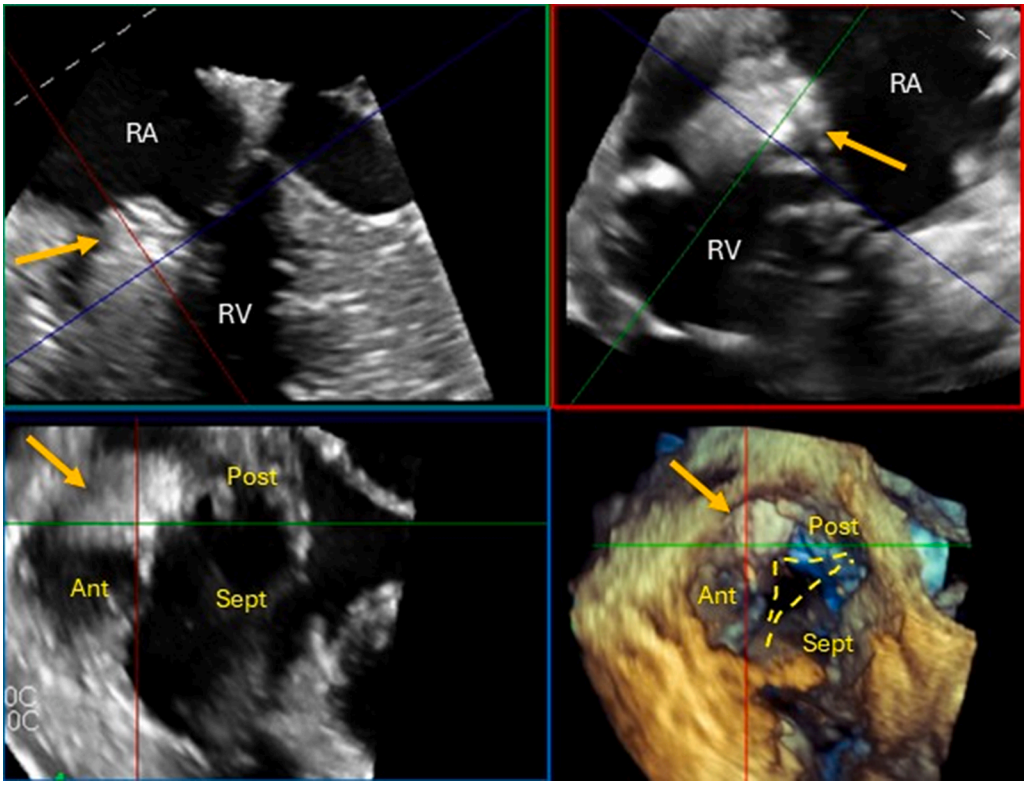
FIGURE 1 Cross Sectional Imaging of the Bullet Retained Within the Right Ventricle



The bullet is appreciated on chest radiography within the right heart (A), and on computed tomographic angiography (sagittal projection) abutting the inferior wall of the right ventricle, near the tricuspid annulus (B).

FIGURE 2 Multiplanar Reconstruction From the Intraprocedural Transesophageal Echocardiography Demonstrating the Appearance and Location of the Projectile Under the Anterior/Posterior Commissure of the Tricuspid Valve, Abutting the Free Wall of the Right Ventricle



Ant = anterior; Post = posterior; RA = right atrium; RV = right ventricle; Sept = septal.

FIGURE 3 Fluoroscopic Projection of the Bullet, Snared and Positioned Within the ÔNÔ Endovascular Retrieval Basket for Removal

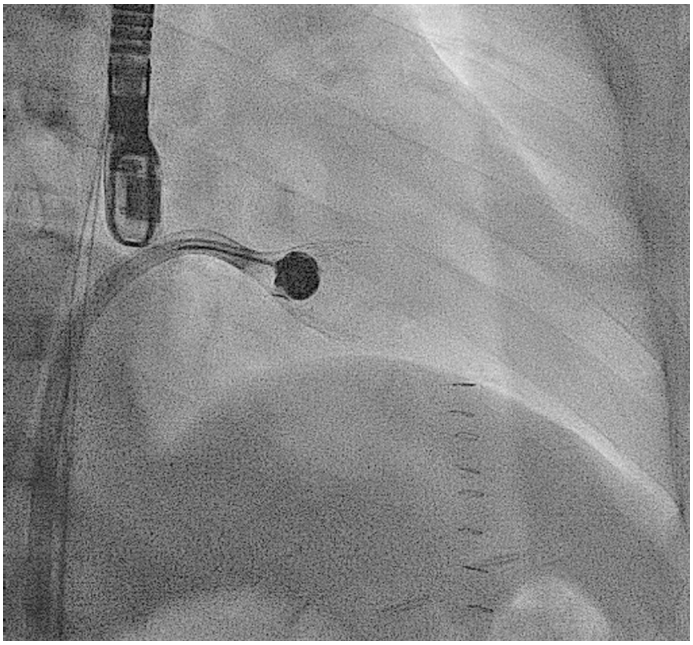
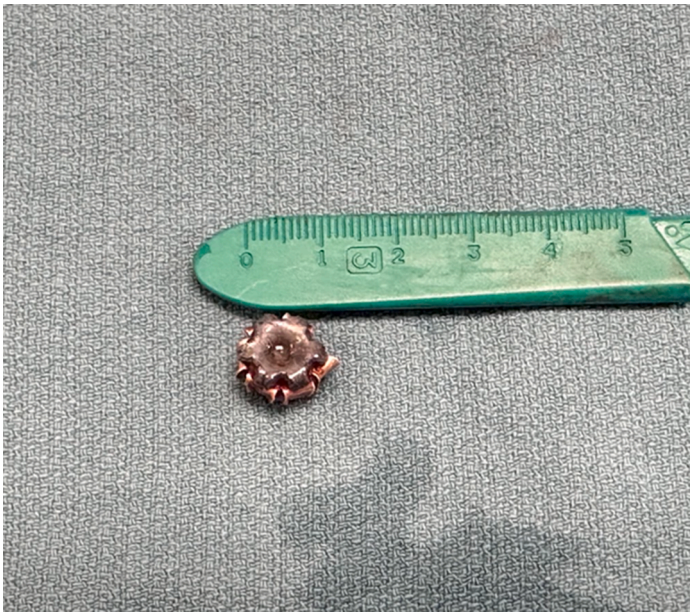


FIGURE 4 Gross Specimen of the Bullet Upon Removal



REFERENCES

1. Steinberg ZL, Elison D, Vincent LL, Oxorn D, McCabe JM. The simplified extraction of atrial tumor with targeted loop electricity (SEATTLE) procedure. *JACC Case Rep*. 2023;10:101758.

2. McFaul CM, Hill B, Sheu R. The use of transesophageal echocardiography in the diagnosis and management of an intracardiac missile embolism. *A A Pract*. 2020;14(12):e01326.

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