

Surgical-conundrum of a hiding ‘Bullet’: Echocardiographic artefact clues the concealed fact!

Sir,

Following a gun-shot trauma, a middle-aged male was conservatively managed for the resultant grade II hepatic injury only to eventually present for the surgical bullet extraction in our cardiothoracic operative suite. With the admission computed tomography of thoraco-abdomen scan delineating the ‘bullet’ as a foreign body lodging just lateral to the aorta at the D11-D12 vertebral level [Figure 1a and b], the surgical team planned a thoraco-abdominal incisional approach.

However, despite extensive exploration after the peri-aortic haematoma evacuation, surgical colleagues failed to discover the ‘bullet’. The reported proximity of the ‘bullet’ and the aorta motivated an intraoperative transoesophageal echocardiography (TEE) aortic examination performed with an X7-2t Philips ultrasound probe and machine (iE33 model; Philips, Bothell, WA, USA). Interestingly, we noticed an unusual echogenic-shadow extending behind the distal most thoracic-aorta to the front of the spinal-cord on TEE [Figure 2a-c]. It is noteworthy that the spinal-cord can be precariously difficult to profile on TEE (until most meticulously visualised employing an inter-vertebral disc as an imaging window).^[1]

Nevertheless, the echogenic-shadow was enough to raise suspicion, particularly in combination with the echocardiographic evidence of a thickened posterior

aortic wall. The context-appropriate inference was suggestive of an embedded echogenic material (‘bullet’ in this case) casting a distal acoustic-shadow on TEE imaging (akin to a mirage to light, the acoustic-shadow emanates as a result of sound waves encountering highly echo-dense structures like prosthetic valves, bones, etc.).^[2,3]

Subsequent to the communication of the aforementioned, the ‘bullet’ hiding in the fibrous tissue accumulation posterior to the aorta was surgically retrieved with utmost care. Albeit in hindsight, the thoughtful team reflected upon the remarkable case-related peculiarities such as the intimate antero-posterior aortic-vertebral column relationship at lower thoracic levels^[4] while to an echocardiographer’s delight: *a usual menace of acoustic-shadowing artefact stood out as a boon in the index case with yet another novel application of the dynamic imaging modality of TEE^[5] for the perioperative physicians.*

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.



Figure 1: Thoraco-abdominal non-contrast CT scan in axial (a) and sagittal view (b) demonstrating foreign body (bullet) shown with arrow lying posteriorly between descending thoracic aorta (DTA) and the vertebrae at T11-12 level. A: Descending thoracic aorta, B: Bullet, C: Vertebrae

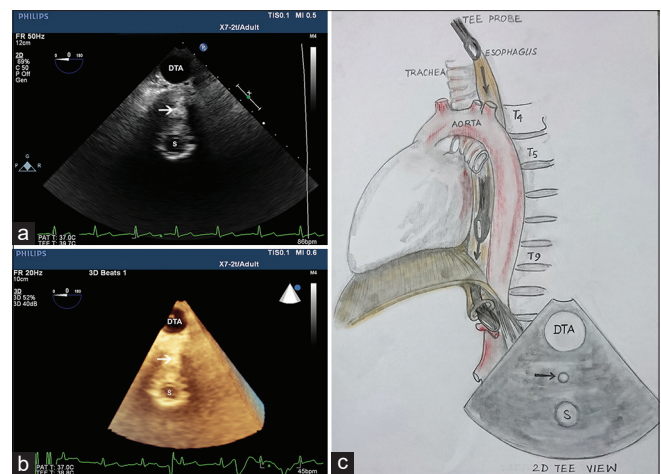


Figure 2: Two dimensional (2D) transoesophageal echocardiography (TEE) (a) and real time 3D TEE (b) showing descending thoracic aorta (DTA) in short-axis view at transgastric level depicting an acoustic shadowing (marked by an arrow) extending antero-posteriorly from the DTA to the spinal-cord (s) raising a suspicion of an echogenic material lodging behind the posteriorly thickened aortic surface. (c) Schematic diagram showing TEE probe in the oesophagus with its relationship to DTA, acoustic shadowing and spinal cord at mid-oesophageal and at subdiaphragmatic level antero-posteriorly

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Conflicts of interest

There are no conflicts of interest.

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REFERENCES

1. Ueda K, Shields BE, Brennan TJ. Transesophageal echocardiography: A novel technique for guidance and placement of an epidural catheter in infants. *Anesthesiology* 2013;118:219-22.
2. Kaya A, Caliskan E, Tatlisu MA, Hayiroglu MI, Tekessin AI, Cakilli Y, *et al.* A retained bullet in pericardial sac: Penetrating gunshot injury of the heart. *Case Rep Cardiol* 2016;2016:2427681.
3. Bertrand PB, Levine RA, Isselbacher EM, Vandervoort PM. Fact or artifact in two-dimensional echocardiography: Avoiding misdiagnosis and missed diagnosis. *J Am Soc Echocardiogr* 2016;29:381-91.
4. Iyer MH, Engoren M, Martin MW. Echo rounds: Transesophageal echocardiography: Identification and management of a misplaced pedicle screw in the descending thoracic aorta after posterior spinal fusion. *Anesth Analg* 2013;116:303-6.
5. Koshy T, Kumar B, Sinha PK. Transesophageal echocardiography and anaesthesiologist. *Indian J Anaesth* 2007;51:324-33.

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