Pulsatile sterile abscess in the left breast following transapical transcatheter aortic valve implantation: a case report

Habib R. Khan1,2*, Mohammad I. Ansari1, Richard W. Varcoe1, and Robert A. Henderson1

1Trent Cardiac Centre, Nottingham University Hospitals, City Hospital Campus, Hucknall Road, Nottingham NG51PB, UK; and 2National Heart and Lung Institute, Imperial College London, Dovehouse Street, London SW3 6LR, UK

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Background
Over the last decade, transcatheter treatment of degenerative aortic valve stenosis has been established as an alternative to surgical aortic valve replacement. Late complications of transcatheter treatment of aortic stenosis (AS) are infrequent.

Case summary
We report an 87-year-old woman treated successfully with 23 mm Sapien 3 transapical transcatheter aortic valve implantation for severe AS. She presented 4 months later with a pulsatile mass in the left breast. After exclusion of other diagnoses, the mass was attributed to a sterile abscess communicating with the pericardial cavity due to post-operative chest infection and pleural effusion. Multimodality imaging helped to define the anatomy of the abscess and the mechanism of the pulsation.

Discussion
This is the first report of a pulsatile sterile abscess occurring as a complication of transapical aortic valve implantation. Multimodality imaging confirmed that the pulsation was due to extension of the abscess into the pericardial cavity, excluded direct communication with the left ventricle, and facilitated successful non-surgical management.

Keywords
TAVI • Aortic stenosis • Sterile abscess • Case report • Pulsatile mass

Introduction
Transcatheter aortic valve implantation (TAVI) is increasingly utilized in elderly patients with high-risk severe aortic stenosis (AS).1,2 In most patients TAVI is carried out via transfemoral arterial access but in patients with peripheral vascular disease, an alternative vascular access route (transcarotid, transaxillary, or transapical) may be appropriate. We report a case of transapical TAVI complicated by late sterile abscess at the wound site, which presented with a pulsatile mass in the left breast.

Learning points
- This case highlights the importance of multimodality imaging in the accurate diagnosis of complex pathology. In this case, ultrasound, computed tomography, cardiac magnetic resonance imaging, and coronary angiography were used in conjunction to help with diagnosis and treatment of the sterile abscess.
- Sterile abscess is very rare after transapical transcatheter aortic valve implantation but is a recognized complication.
Timeline

| Case                                                                 |                                                                 |
|----------------------------------------------------------------------|------------------------------------------------------------------|
| An 87-year-old woman with severe aortic stenosis presented with acute heart failure |                                                                 |
| Day 3                                                               | Transapical transcatheter aortic valve implantation was carried out using a 23 mm Sapien 3 prosthetic valve (Edwards Lifesciences, USA) and implanted successfully with no acute complications |
| Day 30                                                              | Discharged from hospital following rehabilitation and heart failure management |
| Day 117                                                             | Patient presented to her General Practitioner with a pulsatile mass in her left breast |
| Day 127                                                             | Ultrasound of the left breast showed a pulsatile mass, which was thought to be a left ventricular pseudoaneurysm and patient admitted to hospital |
| Day 127–139                                                         | Investigations: Cardiac magnetic resonance imaging: no communication between left ventricle and breast mass; with pulsation transmitted from anterior left ventricular wall to breast component. Computed tomography (CT) chest: multi-located fluid collection with two components communicating from anterior left ventricle to the breast tissue. Coronary angiogram and contrast aortogram: No arterial blood supply to the mass. |
| Day 140                                                             | Diagnostic needle aspiration and drainage of mass resulting in diagnosis of sterile abscess |
| Day 148                                                             | Discharged from hospital |
| Day 188                                                             | Review in clinic with repeat CT scan of the chest showed no recurrence of the mass |

Case presentation

An 87-year-old woman with a history of hypertension presented with acute heart failure symptoms. She was found to have severe AS with left ventricular (LV) ejection fraction of 38%. She had femoral artery tortuosity and underwent urgent TAVI via a transapical approach using a 23 mm Sapien 3 prosthetic valve (Edwards Lifesciences, USA). Post-operative transthoracic echocardiography showed a well seated prosthetic valve with no paravalvular leak and no evidence of pericardial effusion. Chest X-ray showed a left sided pleural effusion. She was discharged home 30 days after admission.

She presented to the breast clinic with a pulsatile mass 4 months after TAVI. Examination revealed a mildly tender, pulsatile mass at the lower aspect of her left breast under the transapical access scar. Cardiovascular and respiratory examination was otherwise unremarkable. She was admitted for further investigations as it was considered to be a LV pseudoaneurysm. Full blood count and C-reactive protein were normal, and no organism was isolated on blood culture after 5 days of incubation.

Ultrasound of the left breast revealed a pulsatile fluid collection measuring 44 mm in diameter, containing echogenic material and suspected to be arising from the apex of the heart. Computed tomography (CT) of the chest showed a 54 × 47 mm multi-loculated fluid collection arising from the cardiac apex and extending along the chest wall into left breast tissue via a communication through the intercostal space (Figure 1). Cardiac magnetic resonance imaging (MRI) scan showed a pulsatile mass measuring 30 × 48 × 46 mm in the left breast and 32 × 15 × 11 mm in the extension into the pericardial space adjacent to the anterior wall of the left ventricle. The mass was initially considered to be a LV pseudoaneurysm but first pass perfusion imaging suggested no direct communication between the LV cavity and the mass (Figure 2, Supplementary material online, Videos S1 and S2). Cine views in the sagittal plane showed dyskinetic motion of the anterior wall of the left ventricle, which pushed against the pericardial component resulting in transmission of a systolic pulse to the breast component of the mass (Supplementary material online, Video S3). Coronary angiography showed non-obstructive plaque disease but no communication to the pulsatile mass. Contrast aortography did not demonstrate any arterial communication with the mass.

Ultrasound-guided needle aspiration of the mass drained 40 mL of purulent fluid (Figure 3). Culture of the fluid did not grow any organisms. She made an uneventful recovery and a repeat CT scan of the chest 1 month later showed no recurrence of the mass (Figure 4).

Discussion

Most of the complications of TAVI occur during delivery of the valve or in the post-operative period and include vascular complications, trauma to the aortic annulus, coronary artery occlusion, prosthetic
valve embolization/misplacement, paravalvular leak, post-procedural infections, and injury to the conduction system requiring permanent pacemaker implantation. To our knowledge, this is the first case report of a pulsatile sterile abscess caused by a transapical TAVI procedure. Multimodality imaging was required to define the anatomy of the abscess, and elucidate the mechanism of the pulsation. We initially suspected that the cavity communicated with the left ventricle, but cardiac MRI confirmed that the abscess cavity extended from the pericardial space with transmission of pericardial pressure changes to the cutaneous component.

We speculate that the abscess was caused by wound infection. Culture of purulent fluid aspirated from the cavity grew no pathogens, confirming a diagnosis of sterile abscess.

Figure 2 Cardiac magnetic resonance imaging during first pass perfusion showing mass with loculated fluid with no evidence of connection with the left ventricle.

Figure 3 Drainage of the abscess with a pigtail catheter. Radiographic contrast injected into the abscess revealed the breast component (red arrow) and pericardial extension (blue arrow).

Figure 4 Computed tomography of the chest 1 month into follow-up shows no recurrence of an abscess.

Supplementary material

Supplementary material is available at European Heart Journal - Case Reports online.

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