Apical left ventricular false aneurysm after transapical transcatheter aortic valve implantation

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Abstract
Transcatheter valve implantation (TAVI) is becoming a routine procedure to treat severe symptomatic aortic stenosis. It is associated with complications different from those of conventional aortic valve surgery. We describe an 80-year old man who developed an apical left ventricular (LV) false aneurysm 3 months after transapical TAVI (TA-TAVI) complicated postoperatively by a surgical site infection (SSI). Three months earlier, an Edwards Sapien bioprosthesis no. 29 had been successfully inserted transapically because of severe comorbidities and a very large aortic annulus. His postoperative course was complicated by acute respiratory failure, gastrointestinal bleeding and a surgical site infection of the thoracic incision; Escherichia coli and Klebsiella pneumoniae were isolated. After surgical debridement drainage and prolonged antibiotic therapy, the wound healed correctly. His emergency chest computed tomography upon readmission for the acute onset of a beating tumefaction at the TA-TAVI site showed a false aneurysm of the LV apex. The apex was closed directly during emergency surgery. The postoperative course was uneventful. Surgical site infection after TA-TAVI, its frequency, treatment and potential role as an underlying cause of this severe complication are discussed.

Keywords: Transapical transcatheter valve implantation • Surgical site infection • False aneurysm

INTRODUCTION
Some complications are associated with the very specific population treated with transcatheter valve implantation (TAVI) and/or the procedure itself [1]. Nonetheless, TAVI indications are being extended to treat severe symptomatic aortic stenosis. Few studies have evaluated TAVI-associated septic complications and their consequences [2, 3]. We describe a false aneurysm of the left ventricular (LV) apex developing 3 months after transapical TAVI (TA-TAVI) complicated postoperatively by a surgical site infection (SSI).

CASE REPORT
An 80-year old man with a history of dyslipidaemia hypertension, severe type 2 diabetes mellitus, morbid obesity (body mass index: 36 kg/m²) complicated by obesity hypoventilation syndrome, sleep obstructive apnoea and chronic kidney disease was referred to our centre for TA-TAVI repair of severe symptomatic aortic stenosis. An Edwards Sapien bioprosthesis no. 29 (Edwards Lifesciences, Irvine, CA, USA) was inserted transapically because of the very large aortic annulus. His postoperative course was complicated by acute respiratory failure, requiring prolonged invasive mechanical ventilation, upper gastrointestinal bleeding and Escherichia coli and Klebsiella pneumonia SSI at left thoracic incision necessitating surgical re-exploration, debridement drainage and 2 weeks of cefotaxime and gentamicin. The left thoracic incision healed correctly, with a normal transthoracic echocardiography, and the patient was discharged on Day 46 post-TAVI.

Three months later, the acute painless onset of tumefaction on the side of TA-TAVI led to his emergency readmission. He was symptom-free, afebrile, with a normally healed wound but a perceptible beating tumefaction. A chest computed tomography scan with intravenous contrast-medium injection (Fig. 1) showed an apical LV false aneurysm, without any pericardial infusion.

An emergency left thoracotomy enabled visualization of the false aneurysm. A Fogarty catheter controlled the bleeding through the LV apex. The cardiac tear was related to the reopening of the previous heart incision for TA-TAVI; no other LV tears were seen. The apical false aneurysm was directly sutured with pledged everting mattress sutures. Intraoperative specimens were sterile. His postoperative course was uneventful; no antibiotics were given. Transthoracic echocardiography on Day 15 was normal. One year later, the patient is well with a normal transthoracic echocardiography and chest computed tomography scan.

DISCUSSION
Herein, we described a mechanical complication (apical LV false aneurysm) developing 3 months after TA-TAVI complicated by SSI.
Few studies have evaluated post-TAVI infectious complications. van der Boon et al. [2] showed that, after transcatheter aortic valve implantation in 298 patients, 58 (19.5%) developed in-hospital infections, with access-site infections occurring in 7 (2.3%). According to their multivariate analysis, the most important determinant of infection was access via the femoral artery, followed by perioperative major stroke and a body mass index of $\geq 25$ kg/m². Baillot et al. [3] specifically described SSI frequency (3.2%; 5/156 patients) and management after TA-TAVI. Their univariate analysis identified overweight as an important risk factor. Pertinently, our patient’s body mass index was 36 kg/m².

Notably, Baillot et al. had a very aggressive surgical approach for all their patients following wound washout and debridement using the greater omentum or the pectoralis major muscle to cover the LV apex. They never observed an LV-apex false aneurysm. Alternatively, Bleiziffer et al. [4] treated their secondary wound-healing problems with vacuum therapy and delayed wound closure, without any particular long-term complications. For our patient, we hypothesize that the SSI, even healed without recurrence, was responsible for weakening the sutures, with development of the false aneurysm 3 months later. Perhaps, a more aggressive surgical approach, like that described by Baillot et al., would have avoided this complication. On the other hand, we can also hypothesize that SSI was not the cause underlying the development of the false aneurysm, because this rare complication after TA-TAVI was previously described in several case reports, without any specific documented aetiology [5].

TAVI remains a relatively new technique with an ever increasing rate of its use worldwide. Much remains to be learnt. In particular, surgical procedures to treat SSI after TA-TAVI need to be defined better. Mechanical complications may occur after TA-TAVI and might be facilitated by SSI. Frequent and careful follow-up seems mandatory in this context.

Conflicts of interest: none declared.

REFERENCES


