



Transcatheter Aortic Valve Implantation after Coronary Artery Bypass Graft

Aniss Seghrouchni^{1,2}, Noureddine Atmani^{1,2}, Younes Moutakiallah¹, Youssef El Bekkali¹, Mahdi Ait Houssa¹

¹Cardiovascular surgery department, Mohammed V military training hospital – Rabat – Morocco

²Faculty of Medicine and Pharmacy of Fes, Sidi Mohamed Ben Abdellah University – Fes – Morocco

ARTICLE INFO	ABSTRACT
Published Online: 27 October 2021	The perioperative risk of surgical aortic valve replacement in patients with severe aortic stenosis and previous coronary artery bypass grafting (CABG) is increased. Transcatheter aortic valve implantation (TAVI) represents an alternative. We report a case of severe aortic stenosis with an indication for native aortic valve replacement in a patient with prior quadruple bypass surgery. The patient underwent implantation of a 29-mm Corevalve Evolut R aortic valve by left femoral catheterization (TAVI), under general anesthesia with surgical approach to the left scarpa. The procedure went well and the evolution was simple.
Corresponding Author: Aniss Seghrouchni	TAVI after coronary artery bypass grafting is an increasingly proposed alternative procedure with excellent results in high-risk surgical patients with severe calcified aortic stenosis.
KEYWORDS: Severe Aortic Stenosis, Coronary Bypass Surgery, Redo Surgery, TAVI	

INTRODUCTION

The perioperative risk of surgical aortic valve replacement in patients with severe aortic stenosis who have previously undergone coronary artery bypass grafting (CABG) is increased. Transcatheter aortic valve implantation (TAVI) represents an alternative [1].

We report a case of severe aortic stenosis with indication for native aortic valve replacement in a patient who underwent previous surgery for quadruple coronary artery bypass surgery.

OBSERVATION

Mr. B.L, 67 years old, with the following cardiovascular risk factors: arterial hypertension, type 2 diabetes for 20 years on oral antidiabetics (ADO), dyslipidemia on statin, known coronary artery disease since 2004, when he underwent a quadruple aorto-coronary bypass under extracorporeal circulation (ECC).

The history of the current disease goes back to 02 years with the installation of a dyspnea of effort class II of the NYHA associated with a general asthenia without notion of thoracic pain, palpitations, nor of syncope or lipothymia.

ECG: in regular sinus rhythm at 80 bpm, heart axis in place, constant PR at 200ms, systolic left ventricular hypertrophy type with presence of secondary repolarization disorder.

Thorax X-ray: Cardiomegaly at 0.6, right hilar overload, straight left middle arch, no infectious focus and presence of 5 steel wires (including 03 in X) of sternal closure.

The biological workup was unremarkable: Hb = 15.2g/dl, WBC=7100/mm³, PLT=196000/mm³, Urea = 0.41g/l, Creatinine=10mg/l, PT = 73%, CRP = 0.2mg/l.

Trans thoracic echocardiography (TTE) showed a degenerative narrowed aortic stenosis (AS) (aortic area = 0.8 cm², mean gradient 41 mmhg, Vmax = 4.08, sub aortic annulus 23 mm) with minimal aortic insufficiency. The left ventricle (LV) was non-dilated, with moderate concentric left ventricular hypertrophy (LVH), hypokinesia of the anterolateral wall, akinesia of the basal and middle segments of the inferolateral wall and of the basal segment of the infero septal wall. Left ventricular ejection fraction (LVEF) is 49%. There is no pulmonary arterial hypertension (PAH), left ventricular filling pressures (LVFP) are low, the inferior vena cava (IVC) is thin and compliant.

Coronary angiography showed good patency of the arterial and venous bypasses.

The indication for a native aortic valve replacement was established and the choice of the type of intervention was transcatheter aortic valve implantation (TAVI), because of the high operative risk.

The pre-TAVI workup performed for the selection of the valve prosthesis size and the right vascular access showed:

Doppler ultrasound of the lower limbs:

- Presence of atheromatous plaque at the bifurcation of the common femoral arteries without hemodynamic repercussions
- Normal arterial velocity with well modulated curves

CT angiography of the aortic root, the aorta and its dividing branches; in particular the supra-aortic trunk, the iliac arteries up to the femoral bifurcation:

- Presence of a calcified atheromatous plaque of the initial part of the left internal carotid artery responsible for a 60% obstruction
- Presence of a calcified atheromatous plaque of the left internal carotid artery responsible for a 48% stenosis
- The sub renal aorta with its dividing branches is unremarkable.

At the CT scan data the different calculations set the adequate TAVI prosthesis size at 29 mm.

The patient underwent a trans catheter aortic valve implantation (TAVI) type Corevalve Evolut R No. 29 mm by left femoral catheterization, under general anesthesia with surgical approach of the left scarpa. The procedure was done in the hybrid room of the Mohammed V military training hospital, lasted 45 min, and the extubation was done just after the end of the procedure in the hybrid room. The evolution was simple, the stay in intensive care was 15 hours and the discharge from the hospital was done at day 3 post procedure.

DISCUSSION

Patients with a history of coronary artery bypass surgery who subsequently develop aortic valve disease are a high-risk group for conventional redo surgery [2].

Redo surgery alone is an independent risk factor for perioperative mortality [2]. A second cardiac procedure by sternotomy requires the release of all or part of heart fibrous adhesions secondary to the first procedure and thus exposes the patient to cardiac wounds or graft injury [2, 3, 4]. It is also well known that clinical outcomes after graft injury are poor [5].

Indeed, the operative risk of re-intervention is high and the mortality estimated according to the literature between 6.4 and 17% [3, 4, 5].

In our case, the patient had already undergone quadruple bypass surgery and needed to have his aortic valve replaced because of a very severe aortic stenosis. Given the increased operative risk, the decision to perform a TAVI was made with an excellent post-procedural result.

According to the literature, transcatheter aortic valve implantation (TAVI) is an alternative for patients who have already undergone heart surgery and with high operative risk [3].

CONCLUSION

Conventional aortic valve replacement surgery is the standard treatment for aortic valve disease. However, redo surgery has a very high morbi-mortality.

TAVI after coronary artery bypass surgery is an increasingly proposed alternative that offers excellent results in high surgical patients with severe calcified aortic stenosis.

REFERENCES

1. Stefan Stortecky MD, Henriette Brinks MD, Peter Wenaweser MD, Christoph Huber MD, Thomas Pilgrim MD, Stephan Windecker MD, Thierry Carrel MD et Alexander Kadner MD. Transcatheter Aortic Valve Implantation or Surgical Aortic Valve Replacement as Redo Procedure After Prior Coronary Artery Bypass Grafting. *Annals of Thoracic Surgery* 2011, 92 (4), 1324-1331.
2. Gandji W, Azarnoush K, Mulliez A, Innorta A, Farhat M, Combaret N, Durel N, Souteyrand G, Lusson JR, Camilleri L. Impact des techniques interventionnelles dans le traitement de la valvulopathie aortique après revascularisation myocardique chirurgicale préalable [Impact of transcatheter aortic valve implantation in the treatment of aortic valve disease after previous coronary artery bypass]. *Ann Cardiol Angeiol (Paris)*. 2016 Feb;65(1):7-14.
3. Vohra H.A., Pousios D., Whistance R.N., Haw M.P., Barlow C.W., Ohri S.K., et. al.: Aortic valve replacement in patients with previous coronary artery bypass grafting: 10-year experience. *Eur J Cardiothorac Surg* 2012; 41: pp. 1-6.
4. D’Onofrio A., Rubino P., Fusari M., Musumeci F., Rinaldi M., Alfieri O., et. al.: Impact of previous cardiac operations on patients undergoing trans-apical aortic valve implantation: results from the Italian Registry of Trans-apical Aortic Valve Implantation. *Eur J Cardiothorac Surg* 2012; 42: pp. 480-485.
5. Numata S, Yaku H. [Valve Surgery after Coronary Artery Bypass Grafting]. *Kyobu Geka*. 2021 Sep;74(10):746-751.