

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/ihj

Case Report

Transcatheter aortic valve implantation under conscious sedation – the first Indian experience



Syed Maqbool*, Vijay Kumar, Vishal Rastogi, Ashok Seth

Department of Cardiology, Fortis Escorts Heart Institute, New Delhi, India

ARTICLE INFO

Article history:

Received 13 July 2013

Accepted 5 February 2014

Available online 2 March 2014

Keywords:

TAVI

SAVR

LACS

ABSTRACT

Transcatheter aortic valve implantation (TAVI) is maturing strongly as an alternative to surgical aortic valve replacement (SAVR) in patients who are inoperable/high risk for open heart surgery. General anesthesia (GA) is the usual mode of anesthesia in these patients, but local anesthesia with conscious sedation (LACS) has recently been described as a safe alternative with some added advantages. We report 2 cases who were unfit for GA and were done successfully under LACS.

Copyright © 2014, Cardiological Society of India. All rights reserved.

1. Introduction

Surgical aortic valve replacement (SAVR) is currently the standard of care to treat patients with severe symptomatic aortic stenosis (AS) and is generally accepted to alleviate symptoms and prolong survival. Based on the results of randomized trials, transcatheter aortic valve implantation (TAVI) is the new standard of care for patients with symptomatic AS who are deemed 'inoperable'. Debatably, TAVI is also an alternative to SAVR in selected patients who are at high risk but operable.¹ The technique of TAVI is thought to be reaching maturity, although several clinical problems associated with the treatment of such high-risk patients remain, with the anesthetic management during TAVI being controversial.² Soon after the introduction of TAVI, general anesthesia (GA) with endotracheal intubation was usually chosen, despite differences in the approach site used for this procedure.^{3–7} Recently, a few studies have demonstrated the feasibility of

TAVI with the patient under local anesthesia with conscious sedation (LACS), owing to the increased experience of the technique and improved devices.^{8–10} GA ensures patient stability during TAVI, is more comfortable for the operator, and facilitates the management of procedural complications and the use of transesophageal echocardiography. The many possible disadvantages of GA compared to LACS, include a requirement for tracheal intubation and mechanical ventilation, delayed extubation, hemodynamic instability, a lack of continuous neurologic monitoring, and prolonged intensive care unit and hospital stays. The LACS has the advantages of being less invasive, shorter procedure time, shorter intensive care unit stay, earlier recovery, shorter hospital stay and a significant reduction in labor costs than the GA group.² GA also may not be feasible for patients with unsuitable airways and severe respiratory comorbidities. We hereby present the first Indian experience of TAVI under LACS in patients unsuitable for GA.

* Corresponding author.

E-mail address: syedmaqbool20@yahoo.com (S. Maqbool).

<http://dx.doi.org/10.1016/j.ihj.2014.02.004>

0019-4832/Copyright © 2014, Cardiological Society of India. All rights reserved.

We hereby present the first Indian experience of two patients who underwent TAVI under LACS as they were unsuitable for GA.

2. Case I

A 79-year old gentleman deemed unsuitable for SAVR was evaluated for TAVI at our institute. His Euroscore was 36. During pre-procedure evaluation the CT aortography showed a superior mediastinal mass. This mass was large and compressing the trachea significantly. The anaesthetist was of the opinion that it would be difficult to intubate the patient in view of more than 50% narrowing of the trachea by the thyroid mass which was pressing it from posterior aspect. In view of the benign nature of the thyroid mass, its removal was deferred. TAVI was performed successfully under LACS with inj xylocaine locally, inj midazolam 0.05 mg/kg and fentanyl 1 µg/kg IV bolus followed by a target controlled infusion of propofol 10 to 75 mg/kg/min adjusted according to the response.

3. Case II

The second case was a 79-year old gentleman at very high risk for SAVR with a Euroscore of 40. He was a known case of chronic bronchial asthma. He was planned for TAVI under general anaesthesia but developed acute severe asthma in hospital one day before the procedure. Asthmatic episode was managed and plan was changed from general anaesthesia to local anesthesia with conscious sedation. Conscious sedation was done similar to Case-I with inj xylocaine locally, inj midazolam 0.05 mg/kg and fentanyl 1 µg/kg IV bolus followed by a target controlled infusion of propofol 10 to 75 mg/kg/min adjusted according to the response. TAVI was carried out successfully in 45 minutes. He remained stable without any respiratory complications during and after procedure.

4. Discussion

About 30–40% of patients with severe aortic stenosis remain unfit for SAVR due to significant comorbidities and advanced medical condition and this cohort of patients is supposed to increase, reflecting the aging population and improving therapeutic options.¹¹ Transcatheter aortic valve implantation (TAVI) has emerged as a novel alternative procedure that enables catheter-based treatment in unsuitable/high-risk surgical aortic valve replacement patients. The technique of TAVI is improving rapidly, but the anaesthetic management remains controversial.² The aim of the anaesthesia remains to provide less invasive anesthesia/anaesthesia without compromising on the safety and comfort of the patient. From the beginning of the procedure general anesthesia has been the most common mode of anaesthetizing the patients for TAVI. General anesthesia not only allays the anxiety in the patients and operators mind but allows the use of intra procedural transesophageal echo imaging. TEE helps in correct positioning of the valve; valve retrieval in case of

inappropriate placement; quick detection and easy handling of an intra procedural complication like severe AR and Hemopericardium. On the other hand GA is not free of the risks in this frail elderly population with comorbidities, bad lungs, poor renal clearance and risks of procedure or anaesthesia related cerebral ischaemia. GA increases procedure time, ICU/hospital stay, labor costs and may not be feasible for patients unsuitable for endotracheal intubation and severe respiratory illness.¹¹ LACS is less invasive, reduces procedural time, decreases ICU/hospital stay and labor costs, however there may be a failure rate of about 4–11% leading to conversion of LACS to GA. The causes for failure like cardiac arrest, myocardial infarction, cardiac tamponade, stroke, shock after balloon valvuloplasty and requirement of a high access retroperitoneal approach are procedure related and unrelated to the anesthetic approach.² One of our patients had a superior mediastinal mass and the other chronic severe bronchial asthma, both deemed relatively unsuitable for GA by the anesthesia team. The procedures were carried out under LACS successfully in just 45 minutes in both the patients. Both were shifted to monitored rooms in one day and discharged on day 5.

5. Conclusion

Local anesthesia with conscious sedation may be an effective alternative to general anesthesia for TAVI in general and particularly in patients unsuitable for endotracheal intubation and severe respiratory comorbidities.

Conflicts of interest

All authors have none to declare.

REFERENCES

- Généreux P, Head SJ, Wood DA, et al. *Eur Heart J*. 2012 Oct;33:2388–2398.
- Yamamoto M, Meguro K, Mouillet G, et al. Effect of local anesthetic management with conscious sedation in patients undergoing transcatheter aortic valve implantation. *Am J Cardiol*. 2013 Jan 1;111:94–99.
- Covello RD, Maj G, Landoni G, et al. Anesthetic management of percutaneous aortic valve implantation: focus on challenges encountered and proposed solutions. *J Cardiothorac Vasc Anesth*. 2009;23:280–285.
- Guinot PG, Depoix JP, Etchegoyen L, et al. Anesthesia and perioperative management of patients undergoing transcatheter aortic valve implantation: analysis of 90 consecutive patients with focus on perioperative complications. *J Cardiothorac Vasc Anesth*. 2010;24:752–761.
- Fassl J, Walther T, Groesdonk HV, et al. Anesthesia management for transapical transcatheter aortic valve implantation: a case series. *J Cardiothorac Vasc Anesth*. 2009;23:286–291.
- Billings FT, Kodali SK, Shanewise SJ. Transcatheter aortic valve implantation: anesthetic considerations. *Anesth Analg*. 2009;108:1453–1462.

7. Klein AA, Webb ST, Tsui S, Sudarshan C, Shapiro L, Denesem C. Transcatheter aortic valve insertion: anaesthetic implications of emerging new technology. *Br J Anaesth.* 2009;103:792–799.
8. Dehédin B, Guinot PG, Ibrahim H, et al. Anesthesia and perioperative management of patients who undergo transfemoral transcatheter aortic valve implantation: an observational study of general versus local/regional anesthesia in 125 consecutive patients. *J Cardiothorac Vasc Anesth.* 2011;25:1036–1043.
9. Motloch LJ, Rottlaender D, Reda S, et al. Local versus general anesthesia for transfemoral aortic valve implantation. *Clin Res Cardiol.* 2012 Jan;101:45–53.
10. Bergmann L, Kahlert P, Eggebrecht H, Frey U, Peters J, Kottenberg E. Transfemoral aortic valve implantation under sedation and monitored anaesthetic care—a feasibility study. *Anesthesia.* 2011;66:977–982.
11. Franco A, Gerli C, Ruggeri L, Monaco F. Anaesthetic management of transcatheter aortic valve implantation. *Ann Card Anaesth.* 2012 Jan–Mar;15:54–63.

The Cardiology Conferences for the year 2014

Sl.No.	Name of the Conference	Dates	Venue
01.	The Association of Physicians of India	20–23, February, 2014	Ludhiana
02.	63 rd Annual conference of American College of Cardiology	28–31, March, 2014	Washington
03.	National Interventional Council	25–27, April, 2014	Kochi
04.	World congress of cardiology	4–7, May, 2014	Melbourne, Australia
05.	Euro PCR	20–23, May, 2014	Paris, France
06.	Hyderabad Live	6–8, June 2014	HICC, Hyderabad
07.	European Society of Cardiology Congress	30 Aug–3 September, 2014	Barcelona, Spain
08.	Transcatheter Cardiovascular Therapeutics (TCT)	13–17, September, 2014	Washington, United States
09.	21 st Annual Conference of Indian College of Cardiology	19–21, September, 2014	Tirupathi
10.	American Heart Association	15–19, November, 2014	Chicago, United States
11.	66 th Annual Conference of Cardiological Society of India	4–7, December, 2014	Hyderabad