Preface

Unmet issues in transcatheter aortic valve implantation

Over the last 15 years, we have seen a rapid and exponential uptake of transcatheter aortic valve implantation (TAVI) for the treatment of patients with severe symptomatic aortic stenosis (1). This uptake has also been coupled with the evolution and advancement in transcatheter valve technologies. As such, a number of new TAVI devices have also been marketed, mainly with the aim of diminishing problems faced with first generation devices; notably, smaller delivery systems, less incidence of paravalvular leak (PVL) or need for permanent pacemaker implantation (PPI) and other device- or procedural related complications (2,3).

In this focused issue of the journal, we provide a review series on unmet issues in the TAVI arena.

The peri-procedural risk assessment has been traditionally determined by the Society of Thoracic Surgeons' (STS) Predicted Risk of Operative Mortality, the Logistic European System for Cardiac Operative Risk Evaluation (EuroSCORE) I and more recently the EuroSCORE-II. The STS, logistic EuroSCORE-I and EuroSCORE-II scores have originally been conceived for cardiac surgery and though applied an further validated for TAVI, the major limitations are the lack of several comorbidities that are not captured (4,5), yet considered important predictive risk factors such as frailty, porcelain aorta, hostile chest/radiation (4,6,7). Drs. Martin, Sperrin and Mamas provide an interesting overview regarding different models for assessing the pre-procedural risk of patients undergoing TAVI.

Pushing the envelope further, several reports have reported on the feasibility and safety of TAVI for the treatment of patients with bicuspid aortic valves. Drs. Patel and Leon discuss about this topic and the available data. In addition, Drs. Murdoch and Webb describe the literature around transcatheter valve-in-valve implantation for the treatment of degenerated surgical bioprostheses.

While doing the pre-TAVI workup, we have learned that the prevalence of coronary artery disease in patients undergoing TAVI ranges, depending of definitions, from 50% to 75% (8,9). Therefore, Drs. Perez, Thielhelm and Cohen discuss data around revascularizing patients with significant coronary artery disease and planned to undergo TAVI.

It has been shown that conscious sedation/local anesthesia is associated with shorter length of intensive care and overall hospital stay. In addition, conscious sedation/local anesthesia may favour an early discharge after TAVI, and the latter, without negatively affecting 30-day outcomes, including readmission rates (10). In this regard, Drs. Sato and Jones provocatively summarize the evidence around general anesthesia and sedation protocols for TAVI.

Newer-generation of TAVI devices comprise smaller delivery systems that have led to a significant reduction in access-site vascular complications but also, the increase use of full-percutaneous access. Hereof, Drs. Vora and Rao provide a review on percutaneous versus surgical cut-down for vascular access.

Once we are across the severely diseased aortic valve, the question comes to whether to implant the valve directly, without pre-implantation balloon aortic valvuloplasty or with valvuloplasty (11,12). Dr. Kotronias and I overview the literature in this regard.

Cerebral embolic protection devices have made a lot of noise in our arena, mainly to reduce silent ischemic embolism; however, there is conflicting data with regards to hard end points such as clinically apparent cerebrovascular accidents or mortality (13). Thus, Dr. Nombela-Franco and colleagues update the current state of knowledge around this topic.

The need for PPI after TAVI (14,15) is this still and unresolved matter. In their chapter, Drs. Toggweiler and Kobza review the "whys" of this issue.

Antithrombotic management after TAVI has become a frequent source of debate, mainly due to the incidence of clinical and subclinical valve thrombosis, and its subsequent risk for thromboembolic event and/or negative impact on valve durability. Dr. Mylotte's group discuss the prons and cons of antithrombotic agents after TAVI.

Long-term valve durability and the need for valve re-intervention (16,17) is nowadays of a major importance, mostly with the trend to move toward lower-risk and younger patients. This topic is thoroughly covered by Drs. Kataruka and Otto.

Finally, Dr. Mylotte's group summarize a status update on TAVI.

I really believe that this special issue reflects a collaborative effort from multiple international colleagues and so, I hope that you enjoy it!

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