

Leading trends in pacemaker implantation after aortic valve replacement in Italy

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LETTER TO THE EDITOR



Leading trends in pacemaker implantation after aortic valve replacement in Italy

To the Editor,

In this issue of *Acta Cardiologica*, Ziacchi et al. described conduction system disorders management in patients treated by surgical and transcatheter aortic valve replacement (AVR) in 55 Italian centres [1]. Conduction disorders remain one of the most frequent complications after AVR, but the management of these events can obviously vary greatly in the same country. The authors gave us a picture of the landscape of pacemaker implantation after AVR in Italy. What can we learn from the results of this survey?

First, the heterogeneity of management is remarkable with significant differences between centres. The factors explaining these differences are not well described and can include many different aspects: type of valve used, personal experience, clinical path in hospital (ICU or CCU monitoring), access to electrophysiology (EP) studies, treated population, etc. This highlights the need for guidelines and expert recommendations on the management of conduction disturbances after AVR. Predictors of risk of permanent pacemaker (PPM) implantation after transcatheter AVR (TAVR) include electrocardiographic (ECG), patient and procedural characteristics. They should be used to plan the procedure: selection of the type of valve, height of implantation, wire-based per-procedural stimulation or stimulation with temporary pacemaker, balloon pre-dilatation. During or after TAVR, different factors must be assessed: permanent or transient complete heart block (CHB) or high-degree atrioventricular block (HAVB), pre-existing bundle branch block (BBB), new-onset BBB, conduction disturbances (PR and QRS duration). These elements should guide management in terms of monitoring, EP study or PPM implantation [2–4].

The second interesting point is that prophylactic pacemaker implantations are rare with 90% of responders in this study and an implantation rate in less than 10% of candidates. Currently, there is little evidence that prophylactic implantation in asymptomatic patients without standard indications for pacing can provide clinical benefit. However, several high-risk criteria for development of CHB or HAVB have been described. Several small studies on prophylactic implantation have been published with interesting results. This approach should be further evaluated with a potential gain in terms of safety, procedural time and length of hospital stay [5,6].

Thirdly, early pacemaker implantation (<1week) was performed by 73% of respondents in case of persistent CHB after TAVR and by 49% after surgical AVR. With the diminution of length of stay after TAVR, an increase in PPM implantation after discharge has been described. This trend may be associated with an increased risk of adverse complications (risk of syncope or sudden cardiac arrest in case of HAVB), may be less cost-effective and may impair the post-procedural recovery [7]. Therefore, identifying predictors of the need for PPM implantation remains crucial before safe discharge.

Surprisingly, only 38% of respondents rated RBBB as the worst prognostic factor for PPM after AVR on 12-lead ECG. RBBB is known to be the strongest and most consistent predictor for PPM implantation after TAVR [8,9]. Given the close anatomical proximity of the aortic valve and the LBB, TAVR devices may cause injury of the proximal part of the left branch of the bundle of His. In case of pre-existing RBBB, the occurrence of a lesion on the LBB may be responsible for CHB. After the procedure, in the absence of pre-existing RBBB, the apparition of LBBB is the most frequent conduction abnormality [10].

Finally, in the event of development of LBBB associated with a moderate decrease in LV function, 55% of respondents would implant a biventricular pacemaker, 15% a dual-chamber pacemaker with conduction system pacing and 30% a conventional dual chamber pacemaker. According to the ESC guidelines, cardiac resynchronisation therapy (CRT) is indeed recommended in patients with heart failure with reduced ejection fraction (HFrEF) [2]. In the TAVR population, frailty and life expectancy should be considered prior to CRT implantation given the higher cost and complications rates of this procedure. With normal LVEF and LBBB, up to 15% of respondents would implant a single-chamber pacemaker. Short- and long-term assessments of TAVR patients showed a relatively low rate of pacemaker dependency, with less than half of patients being pacemaker dependent at early follow-up (< 30 days) and 33–36% at 1-year [9–11]. Thus, dual-chamber pacemaker with algorithms promoting spontaneous AV conduction should be preferred to avoid pacemaker syndrome and improve quality of life [12].


In conclusion, conduction disturbances remain one of the most common complications after AVR and clinical management may vary from centre to centre. Recent

guidelines and expert's consensus, based on predictors of PPM implantation, can guide patient management and procedural planning. The role of prolonged ECG monitoring and loop recorder needs to be evaluated in prospective studies. Further studies are also needed to assess the place of biventricular pacing and the management of new-onset LBBB in this population.

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