Abstract: 225

Pacemaker dependency in patients with permanent pacemaker implantation after TAVI

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Objective: Patients with degenerative aortic stenosis (AS) are known to be prone to conduction disturbance compared to healthy population of same age. In some reports, calcium burden of aortic valve and pre-existence of right bundle branch block (BBB) predicts the permanent pacemaker (PPM) implantation after trans-catheter aortic valve replacement (TAVR), along with valve type and post-TAVR development of left BBB. In some studies, pacemaker dependency after TAVR is variably reported. Reversibility and incidence of pacemaker dependency were defined by arbitrary criteria. We sought to evaluate the incidence of pacemaker implantation after TAVR and pacemaker dependency in these patients.

Methods: This is a single tertiary center retrospective study, evaluating the clinical outcomes, especially regarding pacemaker implantation in patients who underwent TAVR due to aortic stenosis. Enrolled patients underwent TAVR from January 2012 to January 2016. Baseline and clinical information was attained by thorough chart review. Electrocardiogram (ECG) was reviewed and described as baseline rhythm, any conduction disturbance (LBBB, RBBB, degree of AV block). Perioperative, postoperative and most recent obtainable ECGs were all thoroughly reviewed. In addition, pacemaker dependency was defined as more than >90% pacing rate during interrogation.

Results: Of 214 patients who underwent TAVR for severe AS, 28 patients underwent permanent pacemaker implantation (13.1%) after median 23 (0-272) days. Mean age of the pacemaker implanted patients was 80.7 ± 4.8 years. Core valve and Edwards Sapien valves were implanted in 8 (28.6%) and 20 patients (71.4%), respectively. Mean valve size was 28 mm (23-31 mm). Immediate post-TAVR new onset bundle branch block (BBB) occurred in 17 patients (60.7%), and atrioventricular block (AVB) in 23 patients (82.1%). Before pacemaker implantation, electrophysiology study was performed in 15 patients (53.6%) showing conduction disorders. Pacemaker dependency was observed in 15 patients (92.9%) during post-TAVR 30 days, in 17 patients (60.7%) during post-TAVR 30-180 days, and 12 patients (42.9%) after 180 days. Even in patients who underwent electrophysiologic study before pacemaker implant, 6 patients of 15 patients (40%) were independent to pacemaker after 180 days.

Conclusion: TAVR in AS patients carry substantial risk of pacemaker implant. However, in patients with post-TAVR pacemaker implantation, 42% of the patients were not pacemaker dependent during long term follow up (>180 days). Electrophysiology study in these population did not predict long term pacemaker dependency.