TAVR AND PACEMAKER IMPLANTATION

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Post-Balloon Dilation Following TAVR Implantation Increases Pacemaker Dependency

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BACKGROUND Transcatheter aortic valve replacement (TAVR) is increasingly used to treat severe aortic stenosis. A frequent complication of TAVR is atrioventricular (AV) block requiring a permanent pacemaker (PPM). The long-term dependency of pacing after TAVR is unknown. Post-balloon dilation (PBD) immediately after implantation is frequently done. Its long-term influence on AV block is unknown.

METHODS Of 409 consecutive patients without prior PPM, undergoing TAVR (77% balloon-expandable, 23% self-expandable valve), 48 (11.7%) received a new PPM. Patients receiving a late PPM (>10 days after TAVR, n=5), a biventricular device (n=3), or who died within 30 days (n=1) were excluded. PPM dependency was defined as AV block with a ventricular escape rate $\leq$ 40 bpm. Patient and procedural characteristics were examined according to PPM dependency status.

RESULTS Nineteen of the 39 patients (48.8%) in the study group who received a PPM following TAVR were dependent at 30-days. There was no significant difference in age (80.1 $\pm$ 9.3 vs. 82.8 $\pm$ 6.7) or gender (47.4% and 55.0% female) between dependent and non-dependent groups. PPM dependency was more common after a self-expanding valve (47.4% vs. 15.0%, p = 0.03). PBD was performed in 25% of all TAVRs. Among patients without a pre-existing PPM, PBD was associated with a higher rate of new PPM (17.5% vs. 9.8%, p=0.04). Patients who underwent PBD also had a higher rate of PPM dependency (73.7% vs. 20.0%, p < 0.01). PPM dependent patients received the device earlier in the hospitalization (1 $\pm$ 1.6 days vs. 4 $\pm$ 2.6 days post-TAVR, p < 0.01) (Table 1).

Variable	Non-dependent (N = 20)	Dependent (N = 19)	P value
Median Valve Size (mm)	26	26	
Balloon expandable Valve Type	17 (85.0%)	10 (52.6%)	0.03
Self-expanding Valve Type	3 (15.0%)	9 (47.4%)	0.03
Pre-op PR (msec)	183.7 $\pm$ 41.9*	176.9 $\pm$ 26.6^	0.55
Pre-op QRS (msec)	111.1 $\pm$ 36.5	119.3 $\pm$ 25.3	0.42
Days post-TAVR when PPM was placed	4 $\pm$ 2.6	1 $\pm$ 1.6	< 0.01
Post-balloon dilation by valve type (%)			
- Balloon expandable	23.5	90.0	< 0.01
- Self-expanding	0	55.6	0.10

CONCLUSION Half of patients who receive a new PPM following TAVR are not clearly pacemaker dependent at follow-up. PBD is associated with a markedly increased risk of PPM dependency.

CATEGORIES STRUCTURAL: Electrophysiology

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Exposure to Glucocorticoids Prior to Transcatheter Aortic Valve Replacement is Associated with Reduced Incidence of High-Degree AV block and Pacemaker

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BACKGROUND A significant proportion of patients that receive a permanent pacemaker (PPM) after TAVR is not pacemaker-dependent during follow-up. Tissue edema and inflammation, which occur at the device landing zone during valve deployment, may contribute to the pathophysiology of conduction block. As such, glucocorticoids may have therapeutic effects due to their anti-edema and anti-inflammatory properties.

METHODS We hypothesized that exposure to glucocorticoids prior to TAVR will reduce the incidence of conduction abnormalities requiring PPM implantation after TAVR. We included 167 consecutive patients treated with TAVR at the Minneapolis VA Medical Center and University of Minnesota. Exposure to glucocorticoids was assessed by linking electronic medical and pharmacy records. The primary outcome was a new PPM within 30-days of the index TAVR procedure. Patients with pre-existing left bundle branch block or PPM were excluded.

RESULTS Of the 167patients included, 16 (9.5%) were exposed to glucocorticoids prior to TAVR.No differences in age, STS score, pre-existing right bundle branch block or valve type were seen among patients exposed to glucocorticoids versus those who were unexposed (table). Patients exposed to glucocorticoids were more likely to have moderate/severe COPD (43% versus 18%, p<0.01). The cumulative incidence of PPM implantation at 30-days after TAVR was 18%. None of the patients exposed to glucocorticoids required a PPM while 30 (19%) of the unexposed patients did (p=0.04).

	Steroids (n=16)	No Steroids (n=151)	P value
Age	76 (10)	80 (9)	0.07
STS median (IQR)	5.8 (3.9-7.9)	5.6 (3.1-8.8)	0.80
COPD (mod/severe)	(7) 43%	(28) 18%	<0.01
Right bundle brunch block	(1) 7%	21 (13%)	0.49
Implantation Depth (mm, IQR)	4 (3.1-4.5)	4.4 (3.5-5.8)	0.28
Sapien XT	7 (43%)	54 (36%)	0.58
Sapien 3	8 (50%)	79 (52%)	0.87
Corevalve/Evolut	1 (7%)	17 (12%)	0.55
New Pacemaker	0 (0%)	30 (19%)	0.04

CONCLUSION Exposure to glucocorticoids prior to TAVR is associated with reduced incidence of PPM requirement. Tissue edema and inflammation may be significant contributors to the pathophysiology of conduction abnormalities after TAVR and could represent a therapeutic target.

CATEGORIES STRUCTURAL: Valvular Disease: Aortic

TCT-557

Predictors of advanced conduction disturbances requiring a late (≥48 hours) permanent pacemaker following transcatheter aortic valve implantation

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BACKGROUND To analyse and determine the predictors of advanced conduction disturbances requiring late (> 48 hours) permanent pacemaker implantation (PPM) after transcatheter aortic valve implantation (TAVI).

METHODS Consecutive patients were identified by retrospective review of a dedicated TAVI database of a single high-volume centre in Milan, Italy between October 2007 and July 2015. Clinical and procedural data were collected to determine predictors of conduction disturbances requiring a PPM at least 48 hours following TAVI.