HV interval measure immediately before TAVI with SEV for predicting pacemaker implantation

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Introduction: Although improvements, new onset persistent disturbances in electrocardiogram (ECG) after transcatheter aortic valve implantation (TAVI) remains up to 34% at hospital discharge (1), needing permanent pacemaker implantation (PPM) in self-expanding valves (SEV) as high as 15-27% (2,3). In post TAVI scenario, European Society of Cardiology guidelines recommend an electrophyisiologic study centered in His-ventricular electrogram (HV) interval measure for assessing risk of progression to high auriculoventricular block (AVB), if abnormal a PPM is indicated (4,5). We aim to predict PPM through basal HV interval measurement prior TAVI with SEV. Furthermore, we aim to compare different current SEV with basal HV interval and the distinct rate of PPM before discharge.

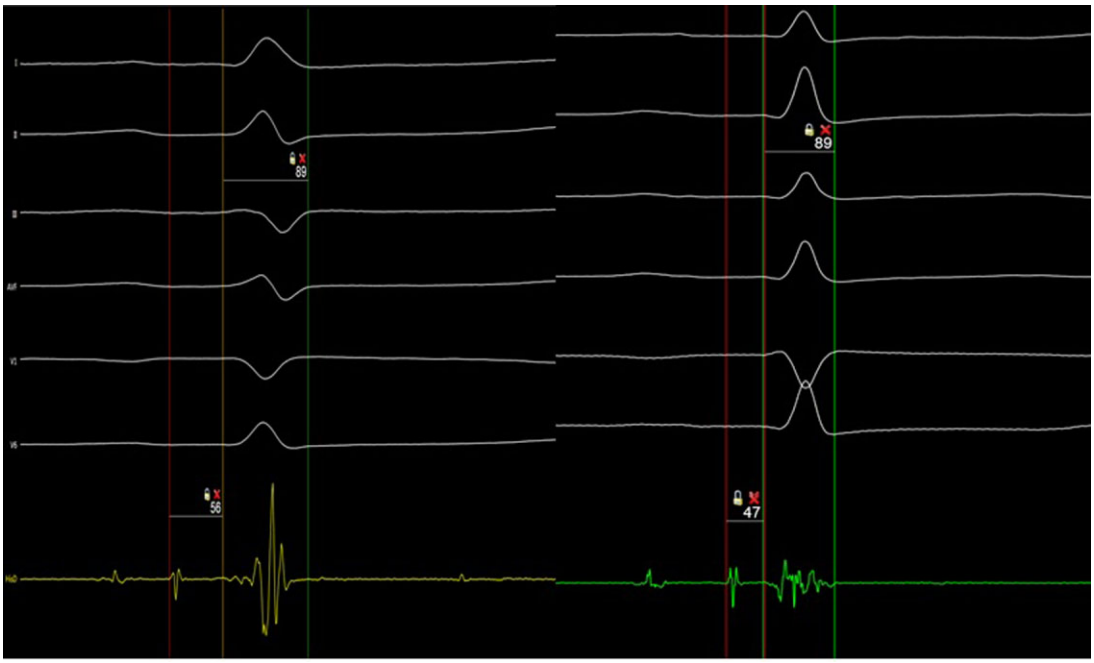
Methods and Results: Single-center prospective cohort study, patients with severe aortic stenosis scheduled for TAVI, sinus rhythm at intervention day, without PPM or history of PPM indication were included. At time of TAVI, contralateral venous puncture to femoral arterial access was made, a tetrapolar catheter was advanced and placed at the septal aspect of tricuspid valve searching for His electrogram. A mobile polygraph was used to measure ECG parameters and HV interval before TAVI. Then, a tetrapolar catheter was advanced to ventricle to perform rapid stimulation as part of habitual valve implantation protocol. After procedure, we performed rhythm surveillance for at least >48-72 hours and based in electrical evolution one of three decisions was made: 1)PPM implant, 2)late post TAVI HV interval re-measure or 3)clinical daily ECG vigilance, if this last was normal, unchanged from basal or with new but stable conduction disturbances, discharge were indicated following ESC guidelines.

A total of 41 patients were enrolled, median age 84±4 years, 24 females (54.5%), PR mean 198±42ms, QRS mean 112±30ms. 18 had a 1st degree AVB (40.9%) of whom 13 (72.5%) had a PR <240ms. EPS data showed prior HV interval mean of 55±9ms. A Mild abnormal HV interval (56-69ms) were seen in 21 patients (51.2%), of whom 12 had a narrow QRS. SEV implanted were 11 (25%) Medtronic CoreValve Evolut+, 5 (11.4%) Biosensors Allegra, 25 (56.8%) Abbott Navitor. Post TAVI procedure, 5 (12.2%) women and 8 (19.5%) men met criteria for PPM implantation before discharge. One woman was implanted 6 days after discharge due to high AVB (66ms HV interval prior TAVR). In a multivariate analysis including sex, age, PR, QRS and HV interval >55ms, valve type the RR (IC 95% 1.37-30.99) risk of PPM was 6.52 folds higher (p=0.019).

Conclusions: An HV interval >55ms before TAVI with SEV increases risk of PPM after TAVI and before hospital discharge. There was no difference in PPM implantation after TAVI between different SEV types in our center.

Sex	Age	PR(ms)	QRS(ms)	QT(ms)	Conduction Disturbance	RR(ms)	AH(ms)	HV(ms)	Outcome
F	80	169	99	369		723	82	52	ClinicFU
M	86	180	112	430	LAFB	790	125	42	ClinicFU
M	89	156	90	392		822	72	69	PaceMaker
F	78	194	89	430		631	95	49	ClinicFU
M	84	177	179	452	RBB + LAFB	606	144	56	PaceMaker
F	77	205	173	482	LBB	754	123	61	PaceMaker
F	84	162	80	450		990	68	54	ClinicFU
F	91	210	95	440		875	103	59	PaceMaker
M	84	231	162	477	RBB	783	138	47	ClinicFU
F	85	191	90	385		834	149	51	PaceMaker
F	91	229	143	430	LBB	970	103	59	ClinicFU
F	81	310	95	430		1104	266	51	ClinicFU
M	80	292	96	492		1359	203	56	PaceMaker
F	86	128	166	387	LBB	690	60	43	ClinicFU
F	84	148	76	478		1173	89	43	ClinicFU
F	86	168	87	421		884	85	44	ClinicFU
F	80	166	94	375		709	81	51	ClinicFU
F	82	179	82	410		968	103	48	ClinicFU
F	82	196	146	510	LBB	943	102	67	ClinicFU
M	85	141	87	449		1018	64	43	ClinicFU
M	87	192	86	403		811	105	49	ClinicFU
M	83	148	142	480	RBB + LAFB	983	82	46	PaceMaker
F	78	230	98	441		918	130	49	ClinicFU
M	88	306	154	466	RBB + LAFB	1006	187	72	PaceMaker
M	85	227	78	368		789	93	62	ClinicFU
F	83	236	162	470	LBB	897	110	66	PaceMaker*
F	81	185	88	508		1188	77	54	ClinicFU
F	87	214	138	431	RBB + LAFB	790	110	66	PaceMaker
M	88	192	135	436	RBB	1220	80	63	PaceMaker
M	85	246	103	490		1360	116	59	ClinicFU
M	83	195	102	443		1037	84	57	ClinicFU
F	91	133	90	449	LBB	987	73	42	ClinicFU
F	77	164	94	492		1245	64	49	ClinicFU
F	84	182	94	390		777	86	54	ClinicFU
M	84	215	114	470	LAFB	866	119	67	PaceMaker
F	88	174	103	420		792	70	53	ClinicFU
F	86	210	85	402		877	79	58	PaceMaker
M	81	230	98	455		1050	120	48	ClinicFU
F	93	179	96	468		1071	114	61	ClinicFU
M	87	208	142	440	LBB	966	142	60	PaceMaker
M	83	219	146	455	LBB	992	147	82	PaceMaker

Table 1. LBB: Left Bundle Block, RBB: Right Bundle Block, LAFB: Left Anterior Fascicular Block. Pacemaker*: Implanted 6 days after discharge due 2:1 auriculoventricular block.



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