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Pacemaker Following TAVR Associated With Increased Tricuspid Reguritation

Paul Nona

Dee Dee Wang

PACEMAKER FOLLOWING TRANSCATHETER AORTIC VALVE REPLACEMENT ASSOCIATED WITH INCREASED TRICUSPID REGURGITATION

PAUL NONA, MD

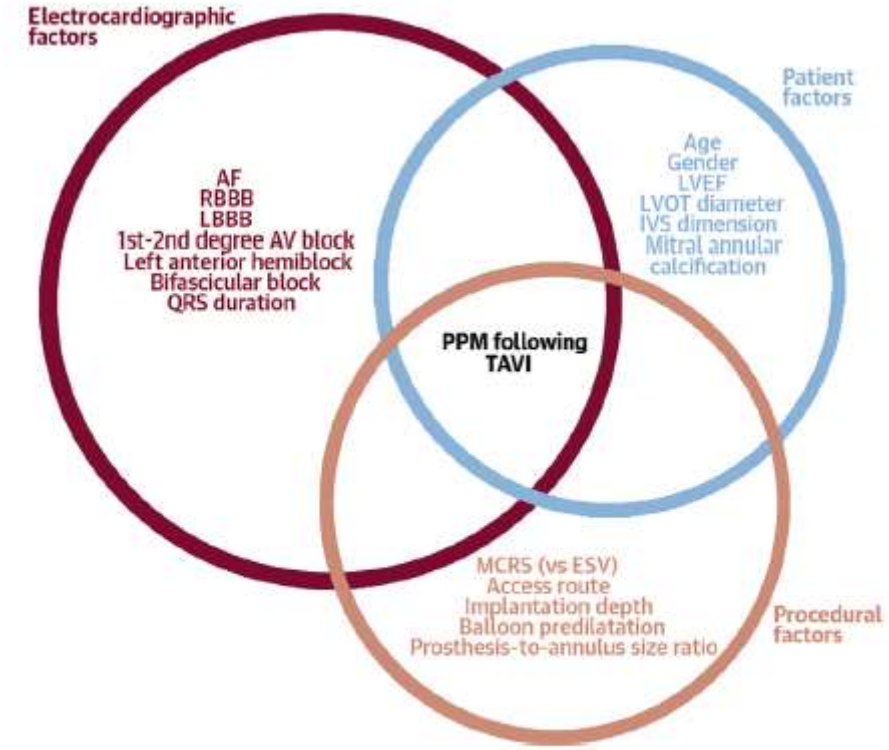
INTRODUCTION

- Transcatheter aortic valve replacement (TAVR) has revolutionized the treatment of aortic stenosis.
- As TAVR procedures increase, more data is available on complications. One such complication is the development of conduction abnormalities post procedure. Often time conduction abnormalities require pacemaker placement to maintain cardiac conduction.
- The higher rate of conduction abnormalities post-TAVR represents one of the main limitations of this treatment approach compared with traditional valve replacement through transthoracic cardiac surgery.
- A common sequelae of pacemaker lead placement is the development of tricuspid regurgitation (TR) due to wire impingement of leaflet function and coaptation.

PURPOSE

- To quantify long-term sequelae of pacemaker implantation and its impact on the tricuspid valve apparatus in patients who underwent TAVR and subsequently developed conduction abnormalities requirement pacemaker implantation.

- To explore the effect of pacemaker implantation on the development of TR and parameters of right ventricular (RV) function.



CENTRAL ILLUSTRATION Previously Identified Factors Associated With Conduction Abnormalities After TAVR

STUDY DESIGN

796 patients underwent TAVR from January 2014 through June 2018

89 patients (11%) underwent pacemaker implantation following TAVR procedure.

34 patients had 2-year follow-up data post-pacemaker implantation and echocardiographic data obtained and compared.

- Echo data obtained prior to TAVR
- Echo data obtained between TAVR and PMP
- Echo data obtained after pacemaker

ECHOCARDIOGEAPHIC VARIABLES

- Ejection Fraction
- Degree of TR
- Pulmonary Artery Pressure
- Tricuspid Annular Plane Systolic Excursion (TAPSE)
- Degree of Inferior Vena Cava Dilation
- Right Ventricular Diameter (RVD)
- Right Ventricle Systolic Pressure
- Right Atrium (RA) Area

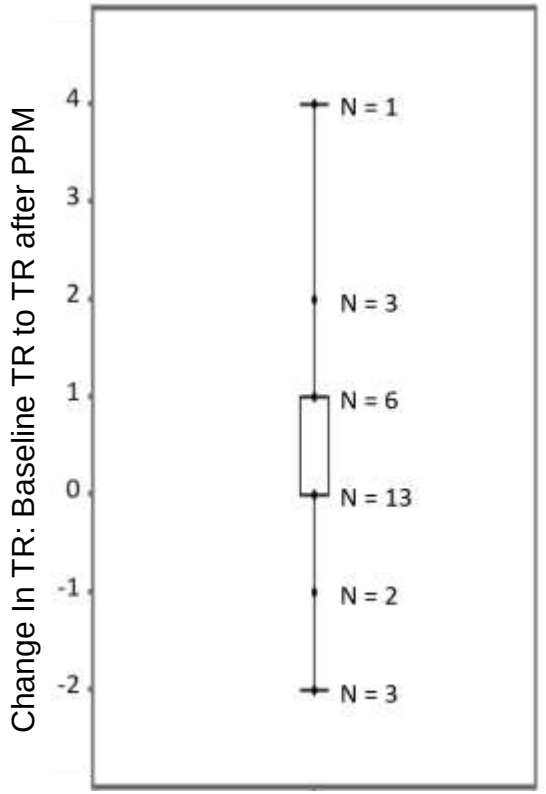
PATIENT DEMOGRAPHICS

Age at TAVR:	79.7 yrs (± 9.0 yrs)
Sex:	
Male	19 (56%)
Female	15 (44%)
Race:	
Caucasian	30 (88%)
African-American	4 (12%)
BMI:	29 .7 kg/m^2 (± 7.0 kg/m^2)
Medical Comorbidities:	
Atrial Fibrillation	15 (44%)
COPD	11 (32%)
Diabetes	16 (47%)
Hypertension	30 (88%)
CKD	18 (53%)

RESULTS

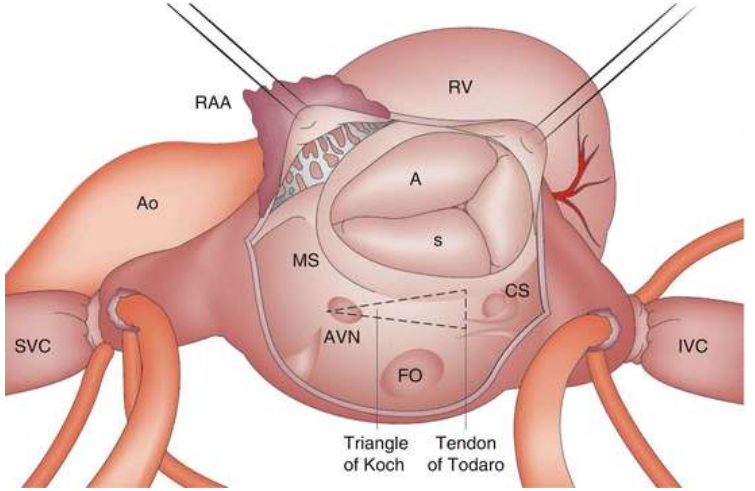
- Overall, there was a trend towards increased tricuspid regurgitation severity at two years post-pacemaker implantation (from 29% to 38% following TAVR and PMP).
- The results additionally indicate a statistically significant change for the RVD, where the mean RVD increased from 2.9 cm to 3.5 cm (p-value = 0.039).
- While not statistically significant, it should also be noted that there was an increase in RA size by area evaluation.

Change In Tricuspid Severity



CONCLUSION

- Our results demonstrate an increased incidence of worsening tricuspid regurgitation severity post-TAVR pacemaker implantation.
- Further analysis indicates that in addition to developing worsening tricuspid regurgitation, there is evidence of early signs of right heart failure as manifested by increasing RV diameter in select populations.
- One possible hypothesis is that during TAVR procedure, balloon inflation for valve anchoring leads to greater expansion of the aortic annulus and greater risk of injury to Koch triangle during balloon inflation and deployment.
- Given recent advances in transcatheter tricuspid valve therapies, more research is required on this complication of TAVR procedure to better optimize patient selection for transcatheter aortic valve replacement.



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