

## Comparison of the 3-class and 5-class grading schemes for quantification of paravalvular regurgitation during transcatheter aortic valve implantation

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**KEYWORDS:** cardiovascular imaging, transesophageal echocardiography, transcatheter aortic valve implantation, paravalvular regurgitation.

**CITATION:** *Cardiol Croat.* 2019;14(9-10):230-1. | <https://doi.org/10.15836/ccar2019.230>

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**Introduction:** More than mild paravalvular regurgitation (PVR) after transcatheter aortic valve implantation (TAVI) represents one of the negative predictive factor for survival and quality of life after TAVI<sup>1</sup>. However, quantification and definition of more than mild PVR remains to be unified. Most commonly used 3 stage grading scheme is often insufficient<sup>2</sup>. Aim of this research was to assess differences in incidence of more than mild PVR during and after TAVI comparing 3 and 5 grades staging schemes.

**Patients and Methods:** Study included 40 patients that underwent TAVI between July 2016 and January 2019 in general anesthesia with transesophageal echocardiography (TEE) during procedure. TEE exams had to be sufficiently recorded to quantify PVR with both grading schemes. Parameters used for PVR quantification and differences between models are presented in **Table 1**.

**Results:** After initial valve implantation 10 (25%) patients had more than mild PVR when quantified using 3 grade model compared to 19 (47.5%) using 5 grade model ( $p < 0.001$ ). Furthermore, 2 patients with severe PVR assessed by 5 stage model were stratified as having moderate PVR using 3 stage model. In total 14 (35%) patients underwent postdilatation and in 3 (7.5%) of them additional valve was implanted. As final result more than mild PVR was present in 2 (5%) patients using 3 grade model and in 12 (30%) using 5 grade model ( $p = 0.027$ ). Detailed stratification of PVR severity is presented in **Table 2**.

**TABLE 1. Transesophageal echocardiography parameters used for paravalvular regurgitation quantification in the 3-class and 5-class grading schemes.**

3-class grading scheme	Trace/mild		Moderate		Severe
Circumferential extent of PVR (%) assessed with CD	1-20		20-30		>30
5-class grading scheme	Trace/mild	Mild to moderate	Moderate	Moderate to sever	Sever
Valve stent shape	Normal	Usually normal	Often elliptical/abnormal	Usually elliptical/abnormal	Elliptical/abnormal
>1 regurgitation jet	No	Possible	Often present	Usually present	Usually present
Regurgitation jet visible	No	Possible	Often visible	Usually visible	Visible
Jet with at its origin (% of LVOT diameter) assessed with CD	1-15	15-30	30-45	45-60	>60
Circumferential extent of PVR (%) assessed with CD	<10	10-20	20-30	>30	>30

PVR – paravalvular regurgitation; CD – color Doppler; LVOT – left ventricle outflow tract.

RECEIVED:  
September 8, 2019

ACCEPTED:  
September 16, 2019



