

## TAVR in patients with low-flow low-gradient aortic stenosis – outcome data after three years from one large centre

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**Background:** The outcome of patients with low-flow low-gradient (LFLG) aortic stenosis after transcatheter aortic valve replacement (TAVR) is not well evaluated. Long-term clinical success is thought to be less pronounced in LFLG patients compared to patients with high gradient (HG) aortic stenosis.

**Purpose:** The purpose of this study was to characterise different LFLG groups and determine their outcome after TAVR. We hypothesised that there would be relevant differences in baseline characteristics and patient survival after TAVR.

**Methods:** All patients undergoing TAVR for severe aortic stenosis at our centre between 2013 and 2019 were included in the study. Patients have been split into groups according preinterventional echocardiography data according to mean pressure gradient (dPmean), ejection fraction (EF), and stroke volume index (SVi). Patients with a dPmean <40 mmHg and SVi ≤35 ml/m<sup>2</sup> were subdivided into classical low-flow low-gradient (cLFLG, EF <50%) and paradoxical low-flow (pLFLG, EF ≥50%). Patients with previous aortic valve replacement or severe aortic regurgitation were excluded from the analysis.

**Results:** 1,772 patients were analysed (mean follow-up 2.2 years, median age 81.7 [77.5–85.7] years) and split into groups: HG, 953 patients (54.3%), cLFLG, 446 patients (25.2%), and pLFLG 373 patients (21.1%).

Baseline characteristics showed significant differences ( $p < 0.01$ ), among others, in sex (male sex, HG 46.1% vs. cLFLG 69.5% vs. pLFLG 44.5%), rate of atrial fibrillation (HG 20.3% vs. cLFLG 36.3% vs. pLFLG 41.6%), coronary artery disease (HG 56.2% vs. cLFLG 73.5% vs. pLFLG 63.4%), and grade 3 or 4 mitral regurgitation (HG 2.2% vs. cLFLG 5.5% vs. pLFLG 6.8%). Accordingly, Society of Thoracic Surgeons (STS) Scores differed significantly: HG, 3.0 [2.0–5.0], cLFLG, 5.0 [3.0–7.3] pLFLG, 3.9 [2.2–6.0] ( $p < 0.01$ ).

Rates of periprocedural complications including death, device failure, pericardial effusion, stroke or myocardial infarction were comparable between groups. Mortality rate (figure 1) was highest for cLFLG patients (43.4% [95% confidence interval, 37.3–48.6%]) compared to HG (25.1% [21.6–28.5%]) or pLFLG (32.9% [26.9–38.4%]), Log-rank test, <0.001. Corresponding hazard ratios were 2.1 [1.7–2.6] ( $p < 0.001$ ) for cLFLG and 1.5 [1.2–2.0] ( $p < 0.001$ ) for pLFLG. Similar results were obtained when adjusting to STS score (figure 2).

**Conclusion:** In this all-comer analysis, almost half of the patients belong to LFLG groups with considerable differences in patient characteristics. While equally safe during the procedure, patients with LFLG aortic stenosis show increased 3-year mortality rates compared to patients with HG aortic stenosis. Further studies evaluating this are needed.

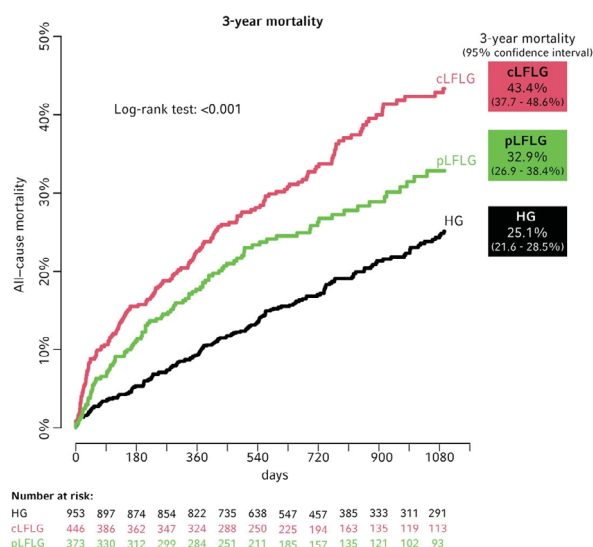


Figure 1. 3-year mortality

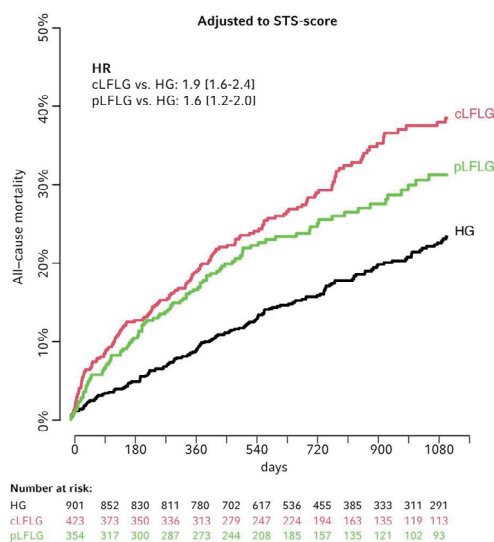


Figure 2. STS score-adjusted mortality