Incidence, Predictors and Outcomes of Failed Percutaneous Coronary Intervention in Contemporary Australian Practice

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Abstract: As techniques and equipment for percutaneous coronary intervention (PCI) have improved, more complex lesions are now being attempted. However, there are limited contemporary data regarding the incidence, predictors and outcomes of failed PCI.

Methods: We prospectively collected data on 34,383 patients undergoing single-lesion PCI in 2013-2017, enrolled in the multi-centre Victorian Cardiac Outcomes Registry, and dichotomised them by whether PCI was deemed successful by the operator on pre-specified criteria. The primary endpoint was 30-day major adverse cardiovascular events (MACE).

Results: 2,080 patients (6.0%) had a failed PCI - they were older (87.5 ± 11.8 vs. 65.5 ± 12.0 years), more likely to have a history of stroke, previous PCI, severe left ventricular dysfunction and chronic kidney disease (all p < 0.001). PCI to chronic total occlusion lesions accounted for 30.2% of all failed PCIs (vs. 2.2% of successful PCIs, p < 0.001). Failed PCI rates were higher in private compared to public hospitals (7.2% vs. 5.4%, p < 0.001). Failed PCI was itself associated with higher 30-day mortality, unplanned revascularisation and MACE (p < 0.001). On multivariable analysis, failed PCI was a strong independent predictor of 30-day MACE (OR 3.44, 95% CI 2.72-4.30, p < 0.001). In a secondary analysis including multi-lesion PCIs, failed PCI of any one lesion remained strongly independently associated with 30-day MACE (OR 3.23, 95% CI 2.68-3.90, p < 0.001).

Conclusion: Our study has characterised demographic and clinical characteristics associated with failed PCI in contemporary practice. Lack of procedural success is strongly associated with adverse patient outcomes. Monitoring rates of failed cases among hospitals and operators is an important quality assurance tool.

http://dx.doi.org/10.1016/j.jhlc.2019.06.636

Incidence, Predictors and Outcomes of Myocardial Injury Following Transcatheter Aortic Valve Implantation (TAVI)

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Background: Myocardial injury following transcatheter aortic valve implantation (TAVI) is common. However, its impact on medium- and long-term outcomes remains controversial.

Methods: We analysed 400 patients undergoing TAVI for severe symptomatic aortic stenosis between 2008 and 2018. Troponin-I values were collected within 24 hours post procedure. Post-procedure myocardial injury (PPMI) was defined as troponin I > 15x the upper limit of normal based on Valve Academic Research Consortium (VARC)-2 criteria. The primary end-point was 2-year mortality.

Results: Mean age of the cohort was 82 ± 7 years; 46% were female. PPMI occurred in 64% (254) of patients. Multivariable logistic regression analysis demonstrated older generation valves Sapien XT (OR 14.2, 95% CI 2.72-74.5, p < 0.01) and CoreValve ‘classic’ (OR 5.31, 95% CI 1.54-8.00, p < 0.01), as well as higher ejection fraction pre-TAVI (OR 1.03, 95% CI 1.01-1.06, p < 0.01) were associated with PPMI. Atrial fibrillation (OR 0.61, 95% CI 0.37-1.00, p = 0.05) and diabetes mellitus (OR 0.38, 95% CI 0.23-0.62) were protective. Patients who had PPMI had longer hospital stay (5 days IQR 4-7 vs. 4 days IQR 3-6, p = 0.02), however PPMI was not associated with complication rates, 30-day or 1-year outcomes. Kaplan-Meier survival analysis up to two years demonstrated lower survival for those who had PPMI (86% vs. 96%, log-rank p = 0.05). On multivariable analysis PPMI was an independent predictor of 2-year mortality (OR 4.26, 95% CI 1.26-14.4, p = 0.02).

Conclusion: PPMI occurs in the majority of patients undergoing TAVI and is independently associated with longer hospital stay and lower 2-year survival. Higher LVEF, and older generation valves were independent predictors of PPMI.

http://dx.doi.org/10.1016/j.jhlc.2019.06.637