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Int J Cardiovasc Res 2018, Volume 7
DOI: 10.4172/2324-8602-C1-006

Evolution of length of stay after surgical and transfemoral or trans-subclavian transcatheter aortic valve replacement in 1849 elderly patients

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Statement of the Problem: In the treatment of severe aortic stenosis in elderly patients, the goal is to choose the strategy that achieves the highest procedural success, the shortest length of stay (LoS), the lowest incidence of complications and that is most economical. Recent studies have focused on duration of hospitalization, particularly on the feasibility of early discharge in transfemoral transcatheter aortic valve replacement (TAVR). There is no data in the literature for the evolution of LoS in either surgical or transcatheter aortic valve replacement. Furthermore, there is a lack of data comparing transfemoral and trans-subclavian TAVR for LoS and complications.

Methods & Results: We analyzed the evolution of LoS for surgical aortic valve replacement (AVR) and TAVR in 1849 elderly patients from 2009 to 2016. In the surgical cohort, (1006 patients, mean age 80.73±3.26 years) mean LoS significantly reduced from 13.81±9.27 days to 10.96±3.77 days ($p<0.0001$). In the TAVR cohort (843 patients, mean age 80.98±7.44 years), LoS significantly reduced from 13.33±9.17 days to 6.21±4.30 days ($p<0.0001$). Correlation between LoS and perioperative variables (multivariate analysis) showed that there are common predictive factors of longer hospitalization ($p\leq0.05$): NYHA class, renal failure at baseline, aortic regurgitation (but not other echocardiographic parameters), significant coronary artery disease, type and size of bioprosthesis, bleeding, atrio-ventricular block requiring pacemaker implantation, moderate/severe post-procedural aortic regurgitation and acute kidney injury. All-cause mortality at 30 days was an indicator of early safety: results showed similar all-cause mortality rates at 1 month (3.77% vs. 4.7% in AVR and TAVR respectively, $p>0.05$). Within the TAVR cohort, between transfemoral (TF, 681 (80.78%) patients), and trans-subclavian (TS, 62 (7.23%) patients), we found comparable results in terms of LoS (7.38±7.11 vs. 7.31±4.32 days, $p>0.05$). According to Valve Academic Research Consortium (VARC)-2 definitions, procedural success was reached in 93% of TF (634 cases) and in 85.4% of TS (53 cases) TAVR but the difference was not statistically significant ($p=0.20$) and procedural death rates were 3.5% in TF and 6.4% in TS TAVR ($p=0.06$), suggesting no differences in terms of safety. The analysis of complications showed a difference that is trending towards significance only for the rates of vascular access-site related complications: 60 (8.8%) patients in TF and 1 patient (1.6%) in TS TAVR ($p=0.05$). All other complications were comparable between the two groups ($p>0.05$).

Conclusions: The analysis of the evolution of LoS for AVR and TAVR over eight years showed a greater improvement in patients undergoing TAVR compared to AVR in the treatment of severe aortic stenosis. This has supported the increasing tendency to employ a less invasive approach, although the two strategies presented comparable results for all-cause mortality at 30 days. The concept of LoS should not be underestimated in such a frail population, as a longer hospital stay is frequently the beginning of a vicious circle (infectious and embolic complications). LoS is comparable in TS and TF TAVR. Also, procedural success and complications are comparable, suggesting the possibility to consider TS access a valid and safe alternative to the TF approach.