Editorial

Porcelain Aorta and Severe Aortic Stenosis: Is Transcatheter Aortic Valve Implantation the New Standard?

Aorta de porcelana y estenosis aórtica grave: ¿La implantación percutánea de válvula aórtica es el nuevo tratamiento estándar?

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Thoracic aorta calcification is associated with coronary and valvular calcification and increased risk of cardiovascular and cerebrovascular events.1 Porcelain aorta represents excessive calcification of the thoracic ascending aorta (Figure) and is a challenging substrate for cardiac surgeons because aortic cross-clamping and aortotomy may cause excessive aortic injury and/or release of thromboembolic material that may cause perioperative stroke.2 Aortic valve replacement in patients with a porcelain aorta may mandate advanced surgical techniques including replacement of the ascending aorta under deep hypothermic circulatory arrest, endarterectomy, or balloon-assisted endovascular clamping to minimize manipulation of the heavily calcified aorta. The apicoaortic conduit is a technique to bypass an excessively calcified ascending thoracic aorta, but this technique can be hampered by concomitant aortic regurgitation and more generalized calcifications that complicate the distal anastomosis of the conduit.3 Transcatheter aortic valve implantation (TAVI) represents a highly attractive “no-touch” alternative for patients with severe aortic stenosis and porcelain aorta. The emergence of TAVI has revolutionized the treatment of aortic stenosis in patients at (very) high risk for operative mortality. In truly inoperable patients, TAVI is the only life-prolonging treatment option with a stunning 25% absolute reduction in 2-year mortality compared with medical therapy and balloon valvuloplasty.4 Based on the favorable PARTNER (Placement of Aortic Transcatheter Valves) Cohort A and B data, the recently updated European Society of Cardiology and the European Association for Cardio-Thoracic Surgery guidelines on the management of valvular heart disease strongly recommend TAVI as the treatment option of choice in inoperable aortic stenosis patients with a reasonable life expectancy and suggest that TAVI is a reasonable alternative to surgical aortic valve replacement in aortic stenosis patients at high operative risk.5,6 With the expanding treatment armamentarium, meticulous risk stratification is clearly essential to select the best treatment modality for each patient with aortic stenosis. The Society of Thoracic Surgeons and the logistic EuroSCORE were validated and calibrated in relatively large surgical databases but tend to lose accuracy in the higher risk cohorts.7 Not surprisingly, these established surgical risk models perform poorly in the contemporary TAVI patient population, which consists of older persons who often have multiple comorbidities. Furthermore, particular risk variables have emerged, such as frailty, chest deformity, and porcelain aorta that are not considered in the above-mentioned models.

In an article published in Revista Española de Cardiología, Pascual et al.8 report on the short- and longer-term outcomes after TAVI with the Medtronic CoreValve System in patients with porcelain aorta. A total of 449 patients were included from 3 academic institutions. The prevalence of porcelain aorta was 8.0%. Bearing in mind the nonuniformity in the definitions used, atherosclerosis of the aorta is reported in up to one-third of octogenarians undergoing cardiac surgery and true porcelain aorta in 1% to 5%.9,10 The incidence of porcelain aorta in large national TAVI registries varies, being 5% in the FRANCE-2 Registry and 11% in a German Registry.12,14

In the studied patient population with porcelain aorta, the prevalence of typical risk factors for atherosclerotic disease, a history of peripheral arterial disease, and coronary revascularization was high. The overall calculated logistic EuroSCORE was no different from that in patients without porcelain aorta. Consequently, the patient cohort with porcelain aorta may in reality have been at even higher operative risk, given that porcelain aorta per se is not considered in the logistic EuroSCORE. It would have been interesting to know how many patients with porcelain aorta had a low calculated logistic EuroSCORE, yet were still considered to be at high operative risk. Moreover, one may wonder whether porcelain aorta per se indicates high operative risk, regardless of the presence of significant comorbidities, and whether it might only impact procedural outcome rather than long-term outcome. In this regard, it is striking that porcelain aorta per se did not impose insurmountable procedural/technical hurdles to these TAVI-experienced heart teams. Of note, proportionally more patients in the porcelain aorta cohort were treated using the axillary/subclavian access route. Since a “transfemoral-first” strategy was applied, this illustrates that porcelain aorta was associated with less favorable iliofemoral trajectories due to small size, tortuosity, calcification and/or atherosclerotic disease. The

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CONFLICTS OF INTEREST

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REFERENCES


