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Balancing risk and innovation: Comparative clinical outcomes of sutureless versus transcatheter aortic valve replacement in Heart Team practice

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Related article
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When surgical valve replacement was the only, monolithic option for patients with aortic stenosis, the key question was: "is surgery feasible?". Over the past 20 years, the range of therapeutic options has expanded. Not only have percutaneous therapies grown exponentially, but surgery itself has also evolved, with minimally invasive approaches and prostheses increasingly resembling their transcatheter counterparts — namely, sutureless and rapid-deployment valves. This unusual overabundance of solutions has shifted the clinical paradigm from "what is possible" to "what is right" to do for our patients. At first glance, having multiple options may suggest that decision-making has become simpler. Yet, this is not exactly the case.

In engineering, there is a well-known mantra: "the right tool for the right job" — the appropriate tool, not necessarily the best one, to accomplish the task. We are not engineers, it is true. In our field, the "tool" is not neutral; it is an invasive procedure, with a specific risk–benefit profile. The "job" consists in treating a patient with a unique combination of anatomy, comorbidities, and life expectancy. Nevertheless, the underlying principle remains unchanged:

identifying which option is most appropriate. This, however, requires a more complex assessment than simply determining whether an option is feasible. Reducing such complexity to the sole appraisal of a risk score — however refined — has become difficult to defend today. Considerations must also include the patient's specific anatomy (i.e., aortic annulus dimensions, degree of calcifications, symmetry of the sinuses of Valsalva, valve morphology), the patient's expectations regarding both quantity and quality of life (with the same procedural risk, treating a younger patient with a long life expectancy is inherently different from treating an older patient), and — no less importantly — cost-effectiveness, a constraint from which we cannot escape.

Within this constellation of variables, the Heart Team has the (sometimes uncomfortable, yet always indispensable) role of integrating the different elements into a shared therapeutic recommendation. Of note, the systematic application of Heart Team-based management in complex patients with valvular heart disease has been recognized to be clinically impactful [1].

In this framework, Bayici et al. [2] reported the results of a real-world, propensity-matched comparison between 53 patients (sutureless aortic valve replacement [SU-AVR] group) who underwent surgical aortic valve replacement with a sutureless prosthesis (Perceval — Corcym, London, United Kingdom) *via* median sternotomy versus 53 patients (transcatheter aortic valve implantation [TAVI] group) who underwent transfemoral TAVI with self-expanding valves. In both cohorts, patients were deemed high-risk by the Heart Team. On a superficial analysis, the low EuroSCORE II values might lead to the mistaken assumption that surgical risk was not truly high. Yet it was — and for very different reasons across the two groups. Surgical patients had hostile anatomy (i.e., small and/or severely calcified aortic annuli). This anatomic complexity is not accounted for in any currently available risk model. Conversely, patients in the TAVI group were considered frail or at high surgical risk despite low EuroSCORE II values by a multisciplinary team.

Early mortality was 13.5% vs. 5.7% (P = 0.17) in the SU-AVR vs. TAVI group, respectively. This was much higher than predicted by risk scores and previously reported [3] and cannot be attributed solely to the learning curve. In particular, the elevated mortality in the SU-AVR group and its temporal clustering within the very first postoperative days suggest an early surgical hazard that would warrant a more in-depth analysis.

In this regard, it is worth noting that the center's local practice (and, consequently, the Heart Team's recommendation) did not include TAVI using alternative access routes.

In particular, TAVI performed *via* surgical access routes, such as the transapical approach, using balloon-expandable prostheses may still represent a treatment option in highly selected, frail patients with aortic stenosis who are unsuitable for transfemoral TAVI, offering a less invasive strategy while avoiding extracorporeal circulation.

Other short-term outcomes were acceptable. As previously reported [4, 5], paravalvular leaks (PVLs) were less frequent in the surgical group. This difference, however, was driven by a higher rate of mild PVL after TAVI. This finding is consistent with prior studies [6], which also show that mild PVL has a limited prognostic impact compared with ≥moderate forms [3]. TAVI confirmed lower transvalvular gradients than SU-AVR, an expected result consistent with previous reports [7]. However, these differences were assessed at only 6 months of follow-up and appear to be of limited clinical relevance in the absence of significant divergence in left ventricular function or pulmonary pressure. Finally, the need for permanent pacemaker implantation in the TAVI vs SU-AVR groups was comparable (11.5% vs. 5.9%; $P = 0.48$), confirming that sutureless valves, due to their radial anchoring mechanism, are not exempt from this complication.

Having acknowledged these necessary considerations, however, the most compelling element of Authors' work is not the search for the technical superiority of one procedure over the other. Rather, it is the successful attempt to place novel technical solutions — such as new TAVI devices and new surgical prostheses — within the broader framework of optimizing management for different patient populations. Indeed, as shown in Figure 1, the current armamentarium of devices and procedures is rapidly expanding, and any theoretical head-to-head comparison would inevitably apply only to highly specific patient subsets. Unfortunately, large clinical trials often enroll heterogeneous populations, which may limit the applicability of their findings to individual clinical scenarios. In this context, reports of local experience may still provide relevant information, albeit with inherently lower scientific weight.

Article information

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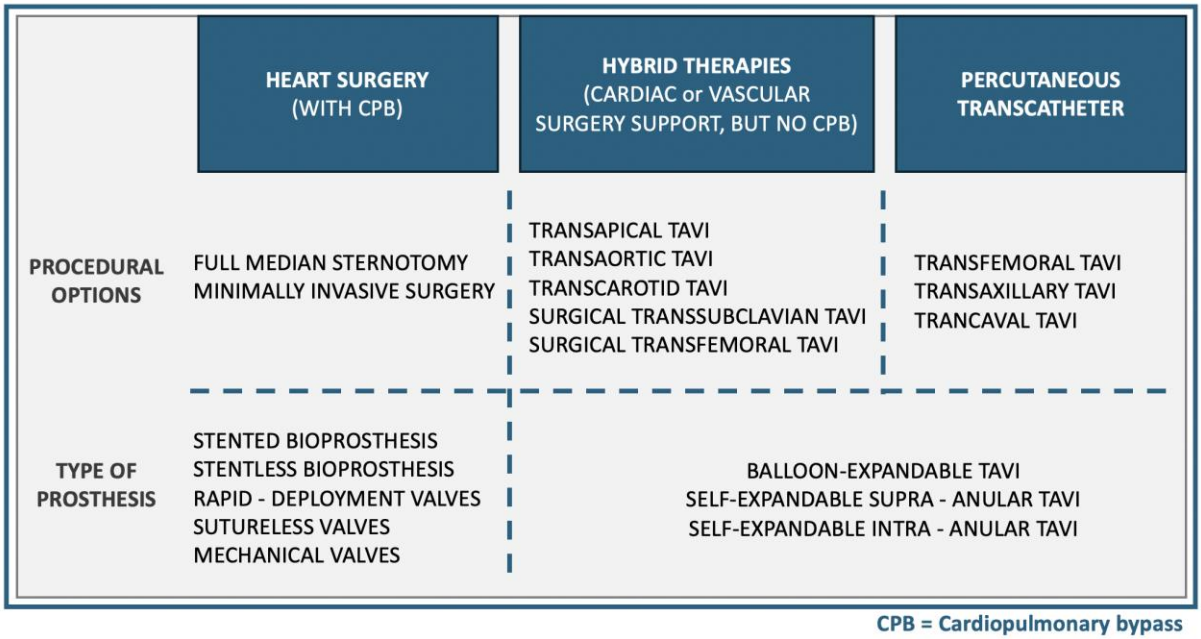

Figure 1. The broad spectrum of contemporary options to treat patients with aortic valve stenosis

Abbreviations: CPB, cardiopulmonary bypass; TAVI, transcatheter aortic valve implantation