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EDITORIAL COMMENT

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Aorto-left ventricular tunnel: directing the spotlight to the aortic valve

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Aorto-left ventricular tunnel (ALVT) is a rare surgical entity, with variable anatomic and clinical presentation. The exact incidence is unknown, though estimates range from 0.1% to 0.5% of cardiac congenital anomalies [1]. In this issue of the *European Journal of Cardio-Thoracic Surgery*, Pang *et al.* [2] present one of the largest published clinical series including 21 patients with ALVT that underwent surgical repair. They retrospectively compared patients with preoperative aortic valve pathology to those without. The group without aortic valve pathology had excellent short and mid-term outcomes with no perioperative death, and no requirement for reoperation. In contrast, the group of patients with aortic valve pathology had a 15% mortality and 46% of them required reoperation. The authors concluded that patients without preoperative aortic valve pathology have excellent prognosis while those with preoperative aortic valve pathology require strict long-term echocardiographic follow-up.

Even though this is a large series, it is a heterogeneous one with significant patient variability, most notably of patient age (5 months to 58 years), clinical presentation, type of aortic valve pathology and surgical technique. These differences, as well as the outcomes, are not significantly different from those of other authors [3, 4]. Immediate postoperative outcomes are excellent, both in this series by Pang *et al.* (all patients survived to discharge), and other series. The most notable finding of this study, however, is the differential in mid- and long-term outcomes between patients with aortic valve pathology and those without. Is this truly inevitable or is there an opportunity to think about this condition in a different way? Should the aortic root complex and aortic valve be managed differently at the time of intervention, in a way that not only reduces the risk of mortality but also the risk for reinterventions? Are there any lessons we can learn from the vast experience that cardiothoracic surgery has accrued in managing acquired and congenital aortic root pathology?

Pang *et al.* [2] included in the aortic valve pathology group both patients with anatomical congenital abnormalities of the valve (such as a bicuspid aortic valve) and those with other pathologies that one would surmise are likely the result of the long-standing effects of the ALVT. The long-term effects of an ALVT on the aortic complex are likely related to a combination of (i) long-standing aortic valve injury, (ii) annular weakness at the area of the tunnel and (iii) secondary aortic complex changes. All of these anatomical and secondary conditions could be potential culprits of long-term failure and as such, we believe they should be addressed at the time of surgery. The surgical technique may indeed be complex and differ in different age subgroups, but following a strict methodical approach to the aortic valve and complex is the key for success and improved outcomes [5].

Despite the fact that Pang *et al.* [2] do not provide echocardiographic discharge data to allow one to determine whether the problem was mainly related to postoperative residual lesions or to further progression of the disease; what becomes clear is how critically important it is for surgeons to address the aortic valve pathology at the time of initial repair. As with other congenital heart pathologies, residual lesions after surgical repair set the stage for future complications. Setting the surgical outcomes' expectation for ALVT repair to include excellent aortic valve function (non-trivial regurgitation), appropriate aortic annular support, and no residual shunting may potentially lead to better long-term outcomes.

Despite its inherent limitations, this study [2] provides additional data to help us make decisions in managing this challenging subset of patients. We support the authors in recommending long-term imaging surveillance. As with other lesions, improving the future outcomes of ALVT repair will depend on a focused approach, including (i) early diagnosis in an attempt to avoid the development of aortic valve pathology; (ii) 'ideal' surgical repair—no residual shunting, no residual aortic valve dysfunction and appropriate annular and aortic root complex support; and (iii) long-term imaging surveillance programme post-repair to ensure the sustainability of the repair and allow for early reintervention when appropriate. Perhaps

by applying lessons from our extensive experience in aortic valve and aortic root pathology, we may further improve outcomes on patients with this rare disease.

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