See Article page 208.

Commentary: Turkish blacksmiths were expert craftsmen at manufacturing scimitars; congenital cardiac surgeons need to be expert craftsmen at repairing them

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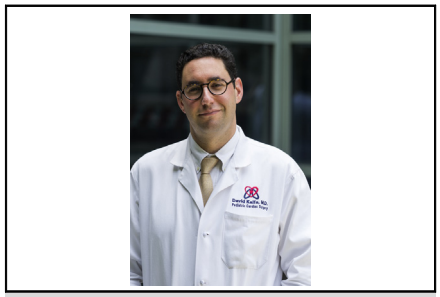

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CENTRAL MESSAGE

Geometric rules for achieving excellent surgical outcomes need to be applied to the repair of scimitar syndrome whatever the technique you choose. We are and remain craftsmen.

In this issue of *JTCVS Techniques*, Baird and colleagues[1] describe the outcome of a 3-patch technique to repair scimitar syndrome to decrease the risk of postoperative pulmonary vein obstruction. The aim of this technique is to bring the posterior wall of the left atrium closer to the scimitar vein (ScV) and avoid baffle kinking and tension on the anastomosis. They show no cases of pulmonary vein obstruction in 11 patients up to 3.6 years of follow-up.

This technique is interesting but requires a lot of patch material and suture lines, possibly exposing the patient to an increased long-term risk of patch degeneration–related obstruction and supraventricular tachycardias, respectively. With an extensive dissection and an excellent understanding of the geometry of the ScV, its connection to the heart (angle/direction/distance), and the geometrical consequences of different techniques, such a complex and "aggressive" repair can be avoided in the vast majority of cases. Nevertheless, this technique should be considered as an additional tool in our armamentarium to repair ScV.

Based on simple and obvious considerations, we think that there is almost no place today for a ScV baffling, leaving in place the native ScV–inferior vena cava (IVC) connection. The acute angle between the ScV and the intracardiac baffle condemns this turbulent-flow V-shaped repair to fail. A disconnection and higher reimplantation of the ScV in the cardiac mass always help with increasing this angle and making this circuit straighter. Using a margin of atrial or IVC tissue, beveling the superior aspect of the ScV, and avoiding the deport of the angle/kinking in the upstream part of the ScV close to or within the lung parenchyma are extremely important technical points. By doing so, we can always reimplant the ScV at least above the level of the IVC–right atrial junction, making the undesirable IVC patch enlargement unnecessary. Even if the anteroposterior translation of the ScV is limited and the left atrium cannot be reached, the reimplantation of the ScV in the right atrium makes an intracardiac baffle straighter and shorter. Finally, I emphasize to residents and fellows the importance of resecting the atrial wall at the anastomotic site and locking the running suture. Indeed, a good ScV repair uses all these "geometric rules" that we tirelessly repeat to residents and fellows and that are the sine-qua-non conditions to achieve excellent outcomes in congenital (especially neonatal) cardiac surgery: "make it straight!," "make it large!," "make it short!," "respect and 'listen' to the tissues!"

We can envision the use of patient-specific computational fluid dynamics–based and fluid–structure interaction–based

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Disclosures: The author reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication Aug 18, 2020; revisions received Aug 18, 2020; accepted for publication Aug 21, 2020; available ahead of print Sept 15, 2020.

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JTCVS Techniques 2020;4:219-20

2666-2507

https://doi.org/10.1016/j.xjtc.2020.08.059

computational tools to assist us in repairing ScV. However, such tools can only help us to demonstrate on a computer what is best for the patient but not how to be successful in achieving this result in the operating room. In our era of advanced preoperative planning, 3-dimensional imaging reconstruction, 3-dimensional printing, and artificial intelligence, we still remain craftsmen, we still remain manual workers, even if this art is based on a strong cognitive process. This is part of the challenge but also the beauty of our art.

Reference

1. Geggel R, Gauvreau K, Callahan R, Feins E, Baird C. Scimitar syndrome: a new multipatch technique and incidence of postoperative pulmonary vein obstruction. *J Thorac Cardiovasc Surg Tech*. 2020;4:208-16.