Increased Reinterventions After Valve-Sparing Tetralogy of Fallot Repair: Is It the Price to Pay?

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The article by Kim et al[1] from Asan Medical Center is a nice retrospective review of their current management of the pulmonary valve in tetralogy of Fallot (TOF). Over a 21 months' period, they operated on 61 consecutive patients and achieved an enviable annular preservation in 95% of patients. The technique used eliminates all supra and subvalvar stenosis and leaves the gradient only at the valve level. This was achieved with fairly mundane technical steps such as right ventricular outflow tract (RVOT) muscle bundle resection, commissurotomy, leaflet shaving, and bougie dilation, with a majority of patients having had an infundibular incision also. Interestingly, 15 patients (24.5%) had no intervention at all on their pulmonary valve. In addition, their postrepair right (RV) and left ventricular (LV) pressure ratio was low at 0.47 ± 0.12, also a noteworthy achievement.

These are excellent short-term results and the team from Asan should rightfully be proud of them. However, 2 questions can be asked: (1) How did this group achieve such good results, where other surgeons still struggle with preservation of pulmonary valve competency after TOF repair and (2) What are their results long term?

The techniques described in the manuscript are standard, as previously mentioned. "Bicuspidalization or tricuspidalization" is mentioned, which I am not sure I fully understand. It is intriguing to see that nearly a quarter of their patients had no pulmonary valve intervention at all, certainly a much higher proportion than in our TOF cohort at NewYork-Presbyterian. Maybe a difference due to different racial backgrounds? Their criteria for intervening on the pulmonary valve at all are equally striking, in that "if the pulmonary valve orifice was larger than a normal pulmonary valve annulus minus 5mm," they elected not to explore the pulmonary valve. To me, that is a very high threshold and I don't think I would ignore a pulmonary valve orifice of 4 mm, for example, if the normal pulmonary valve annulus was 9 mm. They also used a postrepair PRV/LV of 0.8 to decide whether to go back on bypass. My personal opinion is that this is also too high, and I would not be comfortable with a postrepair RV/LV ratio of 0.7, for example. Be that as it may, their patients did very well post-op both from a standpoint of annular preservation and overall outcomes.

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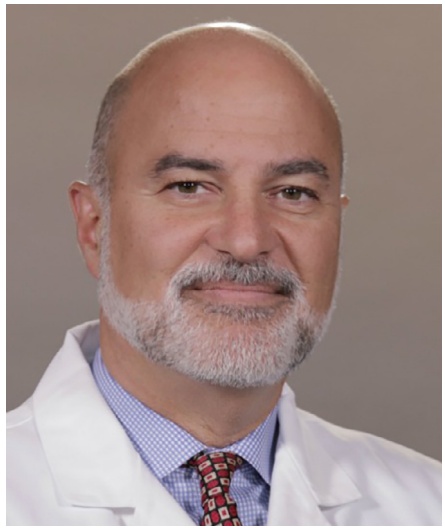

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Central Message

This article describes a consecutive series of patients with tetralogy of Fallot who achieved a 95% annular preservation rate. Techniques are described. Short-term follow-up reveals some limitations and long-term results are needed.

Interestingly, their subsequent statistical analysis revealed that a high intraoperative RV/LV pressure ratio was a significant risk factor for decreased time to the development of significant RVOT obstruction (RVOTO) or reintervention for RVOTO, while neither the preoperative pulmonary valve *z* score nor the intraoperatively measured *z* score were related to the development of RVOTO or reintervention for RVOTO. This finding would favor my impression that a postrepair RV/LV ration of 0.8 is too high. Incidentally, it also bolsters my previously published opinion[2] that the preoperative *z* score, which describes only the annular size, is a poor correlation for success since the valve morphology is not taken into account.

While the short-term results presented here are outstanding, the freedom from significant RVOTO is only 82% at 1 year, and 3 (5%) of patients have already needed an intervention on their RVOT. These numbers are warning signs that the

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long-term results may not be as favorable as the short term. Unfortunately, the concluding sentence of the article might have been more specific in stating that "Minimizing pulmonary valve intervention upon annular preservation can prevent superfluous postoperative pulmonary regurgitation, *but at the cost of a higher re-intervention rate*."

REFERENCES

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