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Commentary: Total endoscopic heart surgery: For the few not yet for the many

Daniel Paul Fudulu, PhD, and
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In their article, Fukumoto and colleagues¹ describe the use of a total 3-D endoscopic surgery approach in a young patient with an aorto-right ventricular fistula due to ruptured sinus of Valsalva aneurysm. The case report is presented with clarity and complemented by high-quality perioperative images and an excellent video of the technique. Clearly, the authors are slick in minimally invasive techniques, particularly in totally endoscopic cardiac surgery. However, as alluded to in their work, their sound technique comes from a high volume of totally endoscopic surgical cases performed in their unit. Although this is an attractive technique, it should be performed in a unit with substantial expertise in this type of surgery, and patient safety should always remain the surgeon's focus. Patient selection is also essential; young, straightforward patients with an excellent physiological reserve are likely the right candidates for this approach, especially during the surgeon's learning curve.

A key outcome determinant of minimally invasive cardiac surgery is the establishment of adequate cardioprotection.² Fukumoto and colleagues show how they manage to achieve a well-arrested heart with the use of selective antegrade cardioplegia after achieving hypothermia and ventricular fibrillation using femoral cardiopulmonary bypass.

This technique is not limited to congenital fistulae but also could be applied to iatrogenic, acquired fistulae, for

Daniel Paul Fudulu, MD, PhD (left), and Gianni Davide Angelini, MD (right)

CENTRAL MESSAGE

A total endoscopic approach to aorto-right ventricular fistula repair is a valuable technique in the right hands for the right patients.

example, right aorto-ventricular fistula after transcatheter aortic valve replacement, a rare occurrence.³ In the context of the increasing volume of transcatheter aortic valve replacements, this approach could prove useful for dealing with such complications when percutaneous approaches are not possible.

As depicted in the video, visualization of the anatomy is sometimes better than with the naked eye, and use of the 3-D vision provides excellent spatial perception for the operator and is superior to 2-D vision systems.⁴ As with any video-assisted procedure, the surgeon can share the video monitor with the rest of the team and record the procedure, a basis for excellent teaching and training in surgery.

Putting this case report into perspective, it provides a testimony as to how much minimally invasive cardiac surgery has expanded. This progress would not have been possible without enthusiastic surgeons embracing new, innovative techniques. Nevertheless, conventional cardiac surgery outcomes should always be the benchmark against which minimally invasive procedures should be measured. Although the debate about the effect on hard endpoints of open cardiac surgery versus minimally invasive cardiac surgery is ongoing, it is evident that such procedures are demanded by patients and are associated with increased patient satisfaction. The future direction of cardiac surgery is toward more endoscopic surgery, accelerated by the rapid advancements of robotic science. Likely more fascinating is the

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potential application of artificial intelligence that will likely enable robots to learn and make predictions from the patterns they learn from thousands of surgeons worldwide, thereby making surgery safer.⁵

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