Robotic mitral repair: Denying the enlightenment

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Those who fear the facts will forever try to discredit the fact-finders.

—Daniel C. Dennett

Darwin's Dangerous Idea: Evolution and the Meaning of Life, 1996

In this issue of the *Journal*, Gillinov and colleagues¹ report the in-hospital outcomes of 1000 robotic mitral operations. Most patients had degenerative mitral valve disease, 80% with isolated posterior leaflet prolapse and 17% with bileaflet prolapse. Their approach consists of 5 right chest incisions, including a 5-cm minithoracotomy, which although less-invasive does not qualify as a totally endoscopic approach. A transthoracic clamp was used in 74% of the cases. Their cardiopulmonary bypass and ischemic times stabilized at around 120 minutes and 80 minutes, respectively, after their first 200 patients. The conversion rate to either a sternotomy or minithoracotomy was 4.3%. The result reflects a 99.5% repair rate, with a 0.1% early mortality and a 1.4% stroke rate. PredischARGE echocardiography demonstrated the absence of more than mild mitral regurgitation in 97.9%. Gillinov and colleagues¹ have provided a reliable algorithm to select patients conservatively and provide excellent outcomes. They conclude that robotic mitral valve repair satisfies current class IIa recommendations for mitral repair in symptom-free patients with degenerative disease and that it therefore represents a particularly appealing approach for this category of patients.

These results corroborate an earlier study by Suri and colleagues,² in which 487 patients with degenerative mitral valve disease (59% with simple pathology and 41% with complex pathology) were treated with the same approach. The results reflected a 100% repair rate, with a 0.2% mortality and a 0.8% stroke rate. The study midterm follow-up showed excellent outcomes, with a low reoperation rate and no difference between the simple and complex pathology groups. Importantly, Suri and associates³ had earlier demonstrated enhanced recovery relative to a sternotomy approach, with significantly earlier return to work for these patients.

Eugene A. Grossi, MD (left), and Didier F. Loulmet, MD (right)

Central Message

Results of robotic mitral repair satisfy current class IIa recommendations for repair, and it represents a particularly appealing approach in asymptomatic patients with degenerative disease.

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A more advanced totally endoscopic robotic approach with systematic endoaortic clamping has been pioneered by Murphy and colleagues.⁴ Their series of 1257 mitral valve cases included patients with more eclectic etiologies and more comorbidities. The repair rate was 93%, with a 0.9% mortality and a 0.7% stroke rate. The average cardiopulmonary bypass and ischemic time were, respectively, 114 minutes and 82 minutes, reflecting more concomitant procedures. PredischARGE echocardiography demonstrated the absence of more than mild mitral regurgitation in 98.3%. At midterm follow-up the reoperation rate was 3.8%. At NYU Langone Health, with a totally endoscopic robotic approach for more than 500 mitral repairs, we have seen similarly gratifying results, with 75% of patients extubated in the operating room and most being discharged by the third postoperative day.

Median sternotomy approach for mitral repair has benefited from its “gold standard” status. We have learned to tolerate such complications as bleeding, transfusions, sternal infections, dehiscence, incisional pain, and undesirable cosmetic results. Unfortunately, acceptance of post-sternotomy complications has become part of the surgeon's DNA, so the “gold standard” has no tarnish. Should we still live in self-deception and continue to propose an unsophisticated approach to younger, symptom-free patients with mitral valve disease? It is becoming clear that centers with expertise in robotic mitral repair have equal results (quality) with less morbidity (cost) and

therefore obtain more value (value = quality/cost). We need to look hard at these accumulating facts and recognize the incremental value that it provides for our patients.

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