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Commentary: Case of the missing message

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Huang and coauthors¹ report on 104 low-risk cardiac surgical patients who were extubated in the operating room (OR). In the first group, 44 patients were operated on through a full sternotomy, and the remaining 60 patients were operated on through a series of less invasive incisions as minimally invasive surgery (MIS). The outcomes in both groups were excellent. The sternotomy group was more likely to include concomitant procedures, such as coronary artery bypass grafting.

Huang and coauthors¹ reported similar times in the OR. Patients in the MIS group had shorter intensive care unit (ICU) time by 3 hours, although this was not statistically significant. Once out of the ICU, this MIS group had a statistically significant reduction in hospital length of stay, 4 versus 5 days. When analyzing reintubation, pneumonia, atrial fibrillation, rhythm disturbance requiring permanent device, renal failure requiring dialysis, stroke, transient ischemic attack, reoperation, and return to the OR for bleeding, there were no significant differences. There was no category in which the sternotomy group outperformed the MIS group.

Huang and coauthors¹ conclude that it is important to consider extubation protocols when comparing groups of patients undergoing sternotomy and MIS. I believe that there is a missing message.

What do these data reveal? OR times were similar, even though the sternotomy group did have more concomitant procedures. These differences in OR time have been reported in mitral valve repair, related to an increase in time on cardiopulmonary bypass of less than 30 minutes in the



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CENTRAL MESSAGE

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MIS group.² There is thus not a large penalty in OR time associated with MIS procedures.

Although it was not statistically significant, there was a shorter ICU stay by 3 hours in the MIS group. This may not seem to be a large difference. From a patient flow perspective, however, this could be the difference between having an ICU bed ready for the next patient or having that patient wait in the OR for the bed to become available.

The fast track protocol described by Huang and coauthors¹ including extubation in the OR achieved a short length of stay in both groups of patients. It has been shown for major surgeries including coronary artery bypass grafting that a shorter length of stay not only reduces hospital costs but does so without a concomitant increase in postdischarge expenses.³

The 1-day decrease in the length of stay in the MIS group was both statistically significant and, I believe, clinically and financially significant. There is some debate as to the actual cost of 1 additional day of stay at the end of a hospitalization, but it is not zero. Monitored beds are at a premium at most hospitals, and having a bed into which to transfer a patient from the ICU improves flow.

Cardiac MIS has remained at a rate of about 20% for mitral valve procedures,⁴ and the rate has been reported as high as 30% for MIS aortic valve replacement.⁵ If cardiac MIS can be performed with a lower impact on the patient, with equivalent or lower cost and at least similar excellent outcomes, why has enthusiasm for these procedures stagnated? Transcatheter therapies, with their short hospital stay and minimal recovery time, have been gaining

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traction. If the only alternative for these patients is sternotomy, patients and referring physicians may prefer transcatheter treatments, even if possibly less effective.

In low-risk patients, surgical mitral valve repair still has advantages relative to transcatheter mitral valve repair, most likely resulting in increased durability and lower transvalvular gradients. Surgical aortic valve replacement in these patients has a lower incidence of paravalvular leak and fewer rhythm disturbances requiring permanent pacemaker implants.⁶ Offering MIS approaches to our patients provides a needed service with a lower impact, as reported by Huang and coauthors.¹ In no category did the sternotomy group fare better than the MIS group.

Should it not be the goal of surgical treatment for cardiac disease to provide an anatomically well-done correction with the least surgical trauma? As demonstrated by Huang and coauthors¹ and by others,² this is clearly achievable with MIS, with at least equivalent if not

superior outcomes to the sternotomy approach. This is the missing message.

References

1. Huang Y, Wittwer ED, Dearani JA, Schaff HV. The impact of surgical incision on hospital stay in patients extubated in the operating room after cardiac surgery. *J Thorac Cardiovasc Surg Tech.* 2020;1:62-4.
2. Atluri P, Stetson RL, Hung G, Gaffey AC, Szeto WY, Acker MA, et al. Minimally invasive mitral valve surgery is associated with equivalent cost and shorter hospital stay when compared with traditional sternotomy. *J Thorac Cardiovasc Surg.* 2016; 151:385-8.
3. Regenbogen SE, Cain-Nielsen AH, Norton EC, Chen LM, Birkmeyer JD, Skinner JS. Costs and consequences of early hospital discharge after major inpatient surgery in older adults. *JAMA Surg.* 2017;152:e170123.
4. Gammie JS, Chikwe J, Badhwar V, Thibault DP, Vemulapalli S, Thourani VH, et al. Isolated mitral valve surgery: the Society of Thoracic Surgeons Adult Cardiac Surgery Database analysis. *Ann Thorac Surg.* 2018;106:716-27.
5. Ghanta RK, Lapar DJ, Kern JA, Kron IL, Speir AM, Fonner E Jr, et al. Minimally invasive aortic valve replacement provides equivalent outcomes at reduced cost compared to conventional aortic valve replacement: a real-world multi-institutional analysis. *J Thorac Cardiovasc Surg.* 2015;149:1060-5.
6. Mack MJ, Leon MB, Thourani VH, Makkar R, Kodali SK, Russo M, et al; PARTNER 3 Investigators. Transcatheter aortic-valve replacement with a balloon-expandable valve in low-risk patients. *N Engl J Med.* 2019;380:1695-705.