surgical approaches. However, they noted reductions in the use of blood products (2.1 units vs ST 3.6 units, \( P < 0.0001 \)) and hospital length of stay (5.1 vs 8.6 days, \( P < 0.0001 \)) in the minimally invasive port-access group, leading to an average reduction of the total patient cost of 20\% (\( P < 0.0005 \)).

A study by Cosgrove III et al. [6] reported on 49 consecutive patients who underwent MT mitral valve surgery. Excluding the costs of the prosthetic valves utilized, the total direct hospital cost was 7\% less in MT, when compared with 40 ST mitral valve operations. Low rates of complications were reported, including 0\% mortality, a 14\% incidence of required blood transfusions and a 4\% incidence of stroke. Direct statistical comparison of outcomes between the surgical approaches was not reported, and there was no difference in the hospital length of stay.

Chitwood et al. [7] compared the outcomes of 31 video-assisted MT mitral valve operations with 100 ST mitral valve surgeries. The authors observed hospital charges and costs per patient to be \$11,428 (27\%) and \$9165 (34\%) lower in the MIMVS group, \( P < 0.02 \). This was driven by less blood product transfusions (2.1 vs 3.6 units) and a shorter hospital length of stay (5 vs 9 days) in the MT group (\( P < 0.05 \) for both).

Cohn et al. [8] in 1997 evaluated the first 50 patients who had aortic or mitral valve surgery via a minimally invasive approach and compared them with 50 patients who underwent ST. In the minimally invasive group, blood product use was less (0.8 vs 2.6 units) and charges were \( \sim 20\% \) lower. Finally, patients undergoing minimally invasive valve surgery had an expedited return to normal activities of daily living (4.6 vs 9.4 weeks, \( P = 0.0002 \)).

**CLINICAL BOTTOM LINE**

A minimally invasive approach for mitral valve surgery via an MT or port access is more cost-effective than ST, which is due to reductions in costs of cardiac imaging and laboratory tests, lower use of blood products, fewer perioperative infections, faster recovery, shorter hospital length of stay, fewer requirements for rehabilitation and lower readmission rates in the following postoperative year.

Conflict of interest: none declared.

**REFERENCES**


**eComment. The effect of conversion rate on the cost-effectiveness of minimal access mitral valve repair**

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We read with great interest the best evidence topic by Santana et al. [1]. The Authors conclude that minimally invasive mitral valve repair (MIMVS) is safe and significantly more cost-effective than median sternotomy.

Cost-effectiveness is influenced by factors relating to the technique, the length of stay and the presence of postoperative complications. Owing to severe intraoperative difficulties, conversion to full sternotomy is also a serious complication of MIMVS that has not been mentioned in this article. Conversion to median sternotomy is a risk that raises the cost of MIMVS. Occasionally, conversion to a full sternotomy is required during minimally invasive mitral valve surgery for reasons that have not yet been well investigated.

The main reason for conversion reported in the literature is major bleeding. Other causes are severe pulmonary adhesions and aortic dissection type A. In all such converted cases, the operative course is significantly prolonged. Furthermore, Vollroth et al. [2] revealed that conversion to full sternotomy leads to severe perioperative morbidities and causes very high 30-day mortality i.e. above 23\%. In recent, large series, however, the incidence of conversion to a full sternotomy was 1\% [3], in contrast to previously reported studies where the conversion rate was between 2.4\% and 2.6\% [4].

Despite the fact that conversion from right lateral thoracotomy to full sternotomy occurs infrequently during minimally invasive mitral valve surgery, it still represents a rare but fatal complication and should be considered when assessing operative costs. Identification of potential risk factors and contraindications for the minimally invasive approach is essential to achieve excellent postoperative results.

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**References**


