

This is the peer reviewed version of the following article:

Sandoval E, Bhoera RA, Tomšič A, Morales-Rey I, García-Álvarez A, Palmen M, Pereda D. Learning curve of robotic mitral repair: prospective two-centre study of proficiency and clinical outcomes. *Eur J Cardiothorac Surg*. 2024 Nov 28;66(6):ezae426. doi: 10.1093/ejcts/ezae426. PMID: 39589894.

which has been published in final form at

<https://doi.org/10.1093/ejcts/ezae426>

Abstract:

Robotic-assisted mitral valve repair surgery has a steep learning curve, and it is not clear whether previous experience in minimally invasive mitral valve surgery (MIMVS) facilitates this process. We aimed to investigate the initial experience of 2 cardiac centres starting their robotic programmes, evaluating the impact of previous MIMVS experience.

Retrospective analysis was performed for the 1st consecutive cases operated due to severe degenerative mitral valve regurgitation using the robotic surgical platform in 2 European centres, 1 transitioning from conventional surgery (centre 1) and the other from mini thoracotomy MIMVS (centre 2). Cumulative sum analysis was used to evaluate the learning process using both surgical times and a combined primary outcome including relevant intra- and postoperative results.

First 62 patients in each centre were included. All median surgical times were shorter in centre 2: cardiopulmonary bypass: 238 vs 115 min, $P < 0.001$; cross-clamp: 143 vs 82 min, $P < 0.001$; and total intervention: 313 vs 228 min, $P < 0.001$. The combined primary outcome showed no significant differences (9.7% vs 8%; $P = 1$). However, the turning point making the end of the learning phase was detected at the 60th case in centre 1 and at the 50th in centre 2. Regarding surgical time, the learning curve was steeper in centre 1 with both cardiopulmonary bypass and cross-clamp overcoming the learning phase after 32 cases, as compared to 16 cases in centre 2.

A successful robotic-assisted mitral repair programme can be safely started coming from either conventional open approach or mini thoracotomy MIMVS. However, previous mini thoracotomy MIMVS experience had positive impact on the initial learning curve.