Endocardial Closure of the Left Atrial Appendage: Established Benefit or Evolving Evidence?

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Short Editorial related to the article Endocardial Left Atrial Appendage Closure for Stroke Prevention in Patients Undergoing Cardiac Surgery: Meta-Analysis

Atrial fibrillation (AF) is a highly relevant arrhythmia in the adult population, frequently occurring in both outpatient and hospital settings. AF can present in paroxysmal, persistent, or permanent forms, and its prevalence is expected to double in the coming decades, driven by population aging, increased comorbidities, and advances in its detection.[1] AF is associated with a higher risk of stroke, systemic thromboembolism, heart failure, cognitive impairment, and mortality.[2] In non-valvular AF, the left atrial appendage (LAA) is the primary site of thrombus formation and the origin of thromboembolic events. Surgical exclusion of the LAA to prevent cardioembolic events dates back to the 1940s, with reports of resection by Madden in 1949.[3,4]

The multicenter LAAOS III study included 4,811 patients with AF and a CHA_2DS_2-VASc score ≥2 undergoing cardiac surgery for another indication; they were randomized to surgical LAA exclusion or control, using four different closure techniques.[5] Most patients remained anticoagulated, reinforcing that LAAOS III evaluated surgical exclusion of the LAA as an additional strategy, not as a substitute for anticoagulation. At the time of the study, the benefit of anticoagulation in preventing stroke in AF had already been established since the late 1980s.[6] After 3.8 years, ischemic stroke or systemic embolism occurred in 4.8% versus 7.0%, respectively (HR 0.67; 95% CI 0.53–0.85; p=0.001), corresponding to a relative reduction of 33%[5]. Thus, current evidence supports surgical exclusion of the LAA as an adjunct strategy to anticoagulation.[1,7]

The meta-analysis published in this issue of *ABC Cardiol* addresses a clinically relevant and relatively specific question: whether LAA closure via endocardial suture, performed concurrently with cardiac surgery, reduces cerebrovascular events in patients with AF. This specificity is a merit, as previous publications grouped distinct surgical techniques.[5] Furthermore, the authors sought to evaluate a recognized limitation of the technique: the possibility that endocardial suturing may result in incomplete LAA closure or late recanalization.[8] Of the 2,716 studies initially selected, only four were included in the meta-analysis: two randomized trials and two retrospective studies, totaling 1,853 patients (1,074 who underwent LAA closure and 779 controls). The relatively small number of studies and the inclusion of different methodological designs should be considered in the interpretation of the results, particularly regarding the precision of the estimates and the generalizability of the findings.[9]

The systematic review and meta-analysis were conducted in accordance with PRISMA recommendations, assessing potential biases and heterogeneity among studies.[10] Although statistical heterogeneity was low, significant clinical heterogeneity was observed, particularly regarding the prevalence and history of AF, anticoagulation strategies, and different indications for cardiac surgery. These differences reflect populations with distinct thromboembolic risk profiles and may influence the incidence of stroke; therefore, they should be considered in the interpretation of the overall effect estimate of the meta-analysis.[1] LAA closure was associated with a lower risk of stroke (OR 0.27; 95% CI 0.16–0.46), with no significant difference in mortality (p=0.75). However, when the authors performed a sensitivity analysis separating the studies according to methodological design, the reduction in stroke did not reach statistical significance among randomized trials (p=0.22) nor among retrospective studies (p=0.05). The reduction in stroke risk was significant only in the combined analysis of the four studies, not being confirmed in isolation by the randomized trials. This meta-analysis suggests that endocardial closure of the LAA may reduce cardioembolic cerebrovascular events, without a significant impact on mortality. However, the limited number of studies and the methodological and clinical heterogeneity should be considered in the interpretation of the results. The results are promising, but the significance observed only in the combined analysis reinforces the need for confirmation in larger randomized studies.

Keywords

Atrial Fibrillation; Left Atrial Appendage Closure; Cardiac Surgical Procedures

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