Don't change the guidelines yet, randomized data on surgical left atrial appendage closure is on the horizon

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Central Message

This meta-analysis demonstrates clear short-term benefits to surgical LAA closure. Ongoing RCTs will most likely determine the future of clinical practice.

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Atrial fibrillation (AF) remains the most common rhythm disorder of clinical significance¹ and one of the leading causes of cardiogenic ischemic events.² The most common anatomic source of thrombus in patients with AF is the left atrial appendage (LAA).³ Greater than 10% of patients undergoing cardiac surgery have been diagnosed with AF preoperatively,⁴ so surgeons have naturally had long-standing interest in LAA interventions that might reduce the risk of stroke. Unfortunately, the data currently available to support routine surgical LAA occlusion present a mixed picture, even to the most optimistic surgeon.⁵⁻⁷

Ando and colleagues⁸ are to be congratulated on their exhaustive systematic review of the literature to gather the best data on surgical LAA occlusion and to determine its short-term (30-day or in-hospital) effectiveness regarding prevention of mortality and stroke via meta-analysis. The authors identified 3 randomized controlled trials (RCTs) and 4 adjusted retrospective studies for inclusion, although only 3 studies (totaling 2464 patients) contributed to the mortality end point and 6 studies (3846 patients) contributed to the stroke end point because of limitations in data extraction from the original publications. The meta-analysis demonstrated that surgical LAA occlusion was associated with a reduction in mortality (odds ratio, 0.384; 95% confidence interval, 0.233-0.631) and stroke (odds ratio, 0.622; 95% confidence interval, 0.388-0.988), with further subanalyses identifying a particularly strong benefit in patients with preoperative AF and possibly with those undergoing valve interventions as well.

Should not such clear-cut results have the guideline writers running to their desks with pencils sharpened to draft an update regarding surgical LAA closure? Not so fast because, despite its many strengths, this analysis has several important limitations: (1) follow-up limited to 30-day/in-hospital events; (2) a heterogeneous study population; and (3) inclusion of, we estimate, at least a dozen variations on surgical LAA closure (endocardial and epicardial suture exclusion/excision, stapler exclusion/excision with

or without suture reinforcement, snares and suture loops, as well as epicardial exclusion clips and other devices), most of which are associated with high failure rates when closely studied via postoperative imaging over time.^{7,9} Thus, despite the statistical and clinical significance of their findings, Ando and colleagues⁸ wisely tempered their conclusion, stating only that surgical LAA closure “should be considered at the time of open cardiac surgery.” Importantly, they did not make an explicit recommendation for this practice, even in patients with preoperative AF.

In the meantime, 2 important RCTs evaluating the effectiveness of surgical LAA closure are currently ongoing, with results expected around the year 2020. The Left Atrial Appendage Occlusion Study III seeks to randomize 4700 patients with AF undergoing cardiac surgery to surgical LAA occlusion or no occlusion using LAA amputation with double-layer linear suture closure (preferred), staplers, or other Food and Drug Administration–approved devices.¹⁰ The AtriClip Left Atrial Appendage Exclusion Concomitant to Structural Heart Procedures trial aims to randomize 2000 patients without preoperative AF but at high risk to develop postoperative AF based on a CHA₂DS₂-VASc 2 or greater to occlusion with the AtriClip device (AtriCure, Inc, Mason, Ohio) or no occlusion.¹¹ The results of these investigations do have the potential to define clinical practice guidelines after they are presented, given

that both RCTs are enrolling substantial numbers of patients from well-defined populations and will report long-term (>4 years) follow-up data.

Meta-analyses often provide powerful summary data in an easily interpretable format that can be very influential in the development of clinical practice guidelines. In this case, however, Ando and colleagues⁸ concluded, and we agree, that their article should serve to encourage prospective investigations on surgical LAA occlusion. Fortunately, large-scale RCT data are fast approaching on the horizon.

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