Don't you want me?

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Received for publication March 7, 2018; accepted for publication March 9, 2018; available ahead of print April 24, 2018.

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J Thorac Cardiovasc Surg 2018;156:586-7

0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2018.03.035>

Vestigial structures of the body, such as wisdom teeth, the vermiform appendix, and the left atrial appendage, promote controversy in management because both their presence and process of removal have consequences. Indeed, we have seen an evolution in general surgery when appendectomy was a routine if not a mandatory procedure in training to a time when nonoperative management has emerged as an acceptable therapy and perhaps even has become the standard of care.¹

The management of our cardiac vestigial organ, the left atrial appendage, continues to find itself in the crosshairs of controversy. Although few aspects have been consistently described (embryology and anatomy), function, complications, and management have yet to reach consensus. In this month's issue of the *Journal*, Juo and colleagues² describe their findings in "Does Left Atrial Appendage Ligation During Coronary Artery Bypass Surgery Decrease the Incidence of Postoperative Stroke?" The authors are commended for assimilating the largest retrospective left atrial appendage study to date, with more than 20,600 patients. This is an astounding dataset, compiled from an all-payer inpatient care database, including 4600 patients that comprised a rigorously selected control group. A propensity score model including a separate validation protocol was used to balance the cohorts. Subgroup analyses examined specific variables, such as appendage ligation, cardiopulmonary bypass, a concomitant Maze procedure, and baseline Congestive Heart Failure – Hypertension – Age > 75 – Diabetes – Stroke – Vascular Disease – Age 65-74 – Sex Category (CHA₂DS₂-VASc) scores. Surprisingly, appendage ligation was not protective under any coronary artery bypass grafting circumstance.

The fact that the null hypothesis was accepted for such a large dataset is intriguing. Large sample sizes have very small error margins and are particularly prone to background noise, spurious correlations, and heterogeneity.³ The increased power can flag even miniscule differences as statistically significant. The challenge lays in evaluating the practical implications of these differences. Perhaps credence should be given to the indifference of appendage ligation on stroke outcomes.

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Central Message

The management of the left atrial appendage remains elusive. There are a plethora of data supporting and refuting surgical closure during routine cardiac surgery.

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The authors could have made a statistical correction by lowering the level of significance to eliminate the chance of randomness. This would have maintained power while reducing the chance of a type I error. The trade-off would be a potential increase in a type II error; however, this may have been mitigated by their large sample size. Unfortunately, additional limitations exist with very large electronic health record datasets.⁴ Systematic biases can occur, such as the way information is obtained and recorded. Sampling biases are also possible. For example, if the study population is not an adequate reflection of the population at whole, inherent biases become magnified. Measurement errors are an additional problem because measurement precision is lost and study variables assume low reliability. Because the data harvest in the present study was obtained using diagnosis codes, we must exercise caution in interpreting the results.

Can we claim resolution? Should we leave the left atrial appendage intact? Or do we need more data? The left atrial appendage seems increasingly like a forgotten stepchild, unwanted and disrespected. Irrespective, we thank Juo and colleagues² for their very impressive dataset and their concerted effort to put this issue to rest. However, technicalities and statistical footwork may preclude us from prematurely abandoning surgical interventions on our heart's vestigial organ.

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