

This is the peer reviewed version of the following article:

Porta-Sanchez, A., Pizarro, G., Salvador-Montanes, O., Sanchez-Quintana, D., & Cabrera, J. A. (2019). Relevant Anatomic Determinants for Epicardial Left Atrial Appendage Exclusion. *Journal of the American College of Cardiology*, 73(3), 380-381. doi:10.1016/j.jacc.2018.10.064.

which has been published in final form at: <https://doi.org/10.1016/j.jacc.2018.10.064>

Letter to the Editor: Relevant anatomical determinants for epicardial left atrial appendage exclusion

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Conflicts of interest: None.

The recent work by Turagam MK et al found a significant reduction in systolic blood pressure after epicardial left atrial appendage (LAA) exclusion when compared with the endocardial method (1). Although the procedural risks associated with epicardial LAA exclusion has decreased significantly over the years, the initial reports showed a complication rate of 11.5%(2).

We would like to highlight important LAA anatomical features (Figure) that are especially relevant when performing the epicardial LAA exclusion procedure: 1: The risk of perforation of the LAA due to its non-uniform wall thickness is well established. 2: The leftward extension of the Bachmann bundle (BB) bifurcates around the neck of the LAA and this could be damaged during LAA exclusion, causing enhanced anisotropic conduction and increased arrhythmic risk. 3: The vascular relationships of the LAA are key: the distance of the LAA to the atrioventricular groove is remarkably variable between individuals. In some cases, the close distance between the LAA ostium and the left circumflex artery (LCx) makes this artery a vulnerable structure when snaring the LAA. Additionally, around 30-40% of patients have the sinus node artery (SNA) originating from their left circumflex artery and in 8% from the left lateral atrial artery (3). When this happens the SNA has an S-shaped course between the LAA and the left superior pulmonary vein. 4: Around 20%-25% of individuals have their left phrenic nerve running over the anterior neck of the LAA with its pericardiophrenic vessels (4). 5: The LAA is a densely innervated structure and the consequences of necrotizing these autonomic nerves can play a role in the blood pressure lowering effect but is still poorly understood.

References:

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Figure: Relevant anatomical structures neighbouring the left atrial appendage:

(A) Dissection to show Bachmann's bundle (BB) with its leftward extensions (yellow broken lines), toward the neck of left atrial appendage (**) in a simulated Lariat intervention. Note the relationship between the left atrial appendage with the vein of Marshall and left circumflex artery (LCx) and great cardiac vein (GCV). (B) Histological section (Masson's trichrome stain) through the ascending aorta (Ao) and neck of the left atrial appendage (LAA). The left phrenic nerve is adherent to the fibrous pericardium, and above and below the neck of the atrial appendage the sinus node artery (SNA) and the circumflex artery (LCx). Note several vegetative nerves surrounding the area (*). Ao=Aorta; LAD=left anterior descending artery; LIPV=left inferior pulmonary vein; LSPV=Left superior pulmonary vein; LV=left ventricle; RVOT=right ventricle outflow tract.

