



# DIAGNOSTIC PERFORMANCE OF CARDIAC COMPUTED TOMOGRAPHY FOR DETECTING PATENT FORAMEN OVALE: EVALUATION USING TRANSESOPHAGEAL ECHOCARDIOGRAPHY AND CATHETERIZATION AS REFERENCE STANDARDS

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## **Background:**

Patent foramen ovale (PFO) is associated with various diseases such as cryptogenic stroke, migraine, and platypnea–orthodeoxia syndrome. Transesophageal echocardiography (TEE), including the microbubble test, is the gold standard for the diagnosis of PFO, however some cases failed to diagnose PFO with TEE alone. Cardiac catheterization, although invasive, is another diagnostic method for PFO. This study aimed to evaluate the diagnostic performance of cardiac computed tomography (CT) for PFO detection comparison to TEE and/or catheter crossing into the interatrial septum (IAS) as reference standards.

## **Objectives:**

Consecutive patients diagnosed with atrial fibrillation and who underwent catheter ablation with pre-procedural cardiac CT and TEE were enrolled in this study.

## **Methods:**

The presence of PFO was defined as 1) confirmation of PFO in TEE and/or 2) catheter crossing the IAS into the left atrium during ablation. CT findings indicative of PFO included 1) presence of channel-like appearance (CLA) on the IAS and 2) CLA with contrast jet flow from the left atrium to the right atrium. The diagnostic performance of both CLA alone and CLA with jet flow was evaluated for PFO detection.

## **Results:**

Altogether, 151 patients were analyzed in the study (mean age, 68 years; men, 62%). Twenty-nine patients (19%) had PFO confirmed by TEE and/or catheterization. The diagnostic performance of CLA alone was as follows: sensitivity, 72.4%; specificity, 79.5%; positive predictive value (PPV), 45.7%; and negative predictive value (NPV), 92.4%. The diagnostic performance of CLA with jet flow was as follows: sensitivity, 65.5%; specificity, 98.4%; PPV,



90.5%; and NPV, 92.3%. The diagnostic performance of CLA with jet flow was statistically superior to that of CLA alone ( $p = 0.045$ ), and the C-statistics were 0.76 and 0.82, respectively.

**Conclusion:**

CLA with contrast jet flow in cardiac CT has a high PPV for PFO detection, and its diagnostic performance is superior to that of CLA alone. Our findings suggest that CLA with jet flow is strongly indicative of the presence of PFO in routine cardiac CT acquisition.

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