Cardiac CT angiography for the diagnosis of mitral valve prolapse: comparison with echocardiography

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PURPOSE: To evaluate the diagnostic performance of coronary computed tomographic (CT) angiography for the diagnosis of mitral valve prolapse (MVP).

MATERIALS AND METHODS: The retrospective case-controlled multicenter study protocol was approved by the institutional review boards. The U.S. part of the study was HIPAA compliant. One hundred twelve patients who underwent electrocardiographically gated 64-section coronary CT angiography (n = 60) or dual-source coronary CT angiography (n = 52) and transthoracic echocardiography (TTE) were included. Fifty-three patients with MVP were matched for age and sex with 59 patients without MVP. CT images were analyzed on three-, two-, and four-chamber (CH) views by two independent observers. MVP was defined as a greater than 2-mm displacement of leaflets below the annulus plane and was subclassified as "billowing" (bowing) or "flail leaflet" (free leaflet margin displacement). Leaflet thickness was measured and defined as thickened if it was greater than 2 mm. RESULTS: The diagnostic performance of CT when three- and two-CH views were combined for the diagnosis of MVP was as follows: sensitivity, 96%; specificity, 93%; positive predictive value (PPV), 93%; and negative predictive value, 96%. On four-CH views, the excursion of billowing was higher than it was on three-CH views (P < .001), and the PPV of the four-CH view for diagnosis of MVP was 89%. The correlation between CT and TTE for excursion of billowing was high (r = 0.80-0.91). In a subset of 32 patients, the agreement between CT and TTE for differentiation of billowing (n = 13) and flail leaflet (n = 2) was 100%. Leaflet thickening was more prevalent in patients with MVP than it was in those without (71% vs 20%, P < .001), and correlation with TTE was good (r = 0.81 [anterior leaflet] and 0.77 [posterior leaflet]). Conclusion: The combined use of three- and two-CH views allows an accurate diagnosis of MVP at coronary CT angiography.