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氏名	蜂矢 健太
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論文審査担当者	<p>主査： 三島 晃 副査： 早野 順一郎, 大手 信之</p>

Relation of epicardial fat to central aortic pressure and left ventricular diastolic function in patients with known or suspected coronary artery disease

Abstract

It is increasingly recognized that epicardial fat represents visceral adiposity and increased epicardial fat has been reported to be associated with adverse metabolic profile, cardiovascular risk factors, and coronary atherosclerosis. The present study tested the hypothesis that epicardial fat may be associated with augmented central aortic pressure and impaired left ventricular (LV) function. We studied 134 consecutive patients undergoing left-sided cardiac catheterization for coronary artery disease (CAD) and examined the relation of epicardial fat volume measured by multi-detector computed tomography to ascending aortic pressure and LV ejection fraction determined by cardiac catheterization as well as indices of LV diastolic function assessed by Doppler echocardiography [early diastolic mitral annular velocity (e') and a ratio of early diastolic mitral inflow to annular velocities (E/e')]. Epicardial fat volume indexed to body surface area correlated positively with age ($r = 0.24$, $P < 0.01$), body mass index ($r = 0.38$, $P < 0.001$), systolic aortic pressure ($r = 0.21$, $P < 0.05$), aortic pulse pressure ($r = 0.23$, $P < 0.01$), LV ejection fraction ($r = 0.22$, $P < 0.05$) and E/e' ($r = 0.24$, $P < 0.05$) and did negatively with e' ($r = -0.31$, $P < 0.05$). In multivariate linear regression including potential confounders, increased epicardial fat volume index correlated with aortic systolic and pulse pressure and LV diastolic function indices, but not LV ejection fraction. In conclusion, we found that epicardial fat was associated with augmented central aortic pressure and LV diastolic dysfunction in patients with known or suspected CAD.