with coronary collateral flow (2), together with more dense endothelial-cell-marker expression. In addition, they also argue that an interesting study in which was investigated the levels of soluble endothelial adhesion molecules (CAMs) and vascular cell adhesion molecule (VCAM-1) intercellular adhesion molecule-1 (ICAM-1) and E-selectin, and found that poor collateral circulation is associated with increased levels of soluble CAMs in patients with obstructive coronary artery disease (3). In conclusion, they said that the inter-individual variations of endothelial cell marker expression and soluble adhesion molecules might explain why some patients develop adequate collateral circulation whereas others do not, as well as the functional endothelium, inflammatory cells, specifically monocytes, and endothelial progenitor cells.

In our opinion, four points are very important in collateral development. First point is first response of jeopardized tissue to ischemia, second point is target tissue and cells for ischemic signals in collateral development, third point is the active and increased functional cells, and last point is the homing capability to ischemic tissue of functional effectors cells. All of points can be disturbed by various risk factors, possibly with impairment of sufficient and required microenvironments at cellular level, or may be insufficient for good collateral growth in patients with defective genetically background.

The growth factors and cytokines such as VEGF and EPO (4), which are secreted in response to hypoxia, may stimulate the resident and remote cells to induce angio- and arteriogenesis with paracrine end endocrine mechanisms. Lastly, some chemokines like CXCL1 are associated with the presence and extent of spontaneously visible coronary artery collaterals (5). The other important prerequisite for collateral vessel growth is endothelial function. Endothelial nitric oxide synthase activity was found to be related to the angiogenic capability in animal models (6) and clinical settings (7). Resident and bone marrow-derived progenitors and some monocyte subtypes (8, 9) were determined as effector cells for collaterals. They serve as bioreactors and reservoirs of various cytokines and chemokines, which stimulate arteriolar growth in a paracrine fashion. As a prerequisite, the functional integrity of the monocyte and EPCs are crucial for this process. A chemotactic deficit should hamper the monocyte and EPCs to reach sites of vascular remodeling and, thereby, its active participation in collateral growth.

The homing capability to ischemic tissue of functional effector cells is related to damaged endothelium as well as trans-migrant cell functions. This stage may possibly affected by microenvironment, such as oxidant status, signal transmission, and may be an anti-oxidant concentration in plasma, bilirubin (10).

The deleterious effects of vascular risk factors on factors necessary for collateral growth, including pro-angiogenic growth factors, endothelial function, the redox state of the coronary circulation, intra and intercellular signaling, monocytes and bone marrow-derived progenitors cells may impair collateral development by altered microenvironment of the coronary circulation.

Collateral growth is a multistage process and different factors can harm the integrity of arteriogenesis. Known cells and cytokines may be a little part of arteriogenesis as well as unknown cells and cytokines/chemokines. Heterogeneity in collateral formation despite similar degrees of coronary obstruction can be related to different effects of inflammatory cells, the capability of homing factors in ischemic tissue and levels of both cytokine and chemokines related with ischemic tissue and functional cells on the development of collaterals. Besides, the above four points may contain the candidates for new important cells, cytokines and maybe receptors.

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Echocardiographic measurement of epicardial fat thickness: In search for a consensus/Correlation of echocardiographic epicardial fat thickness with severity of coronary artery disease-an observational study

Epikardiyal yağ kalınlığının ekokardiyografik ölçümü: Bir konsensus arayışında/Koroner arter hastalığının şiddeti ile ekokardiyografik epikardiyal yağ kalınlığının ilişkisi-gözlemsel bir çalışma

Dear Editor,

We read with great interest the article published by Shemirani et al. (1) in The Anatolian Journal of Cardiology, which showed a significant association between epicardial fat thickness (EFT) and coronary

artery disease. This study was methodologically correct in measuring the EFT. As Iacobellis et al. (2) suggested, epicardial fat is best measured at end-systole, because it is compressed during diastole. However, the majority of the studies designed to evaluate this subject, measured the EFT at end-diastole. Echocardiographic EFT measurement is an emergent tool for the cardio-metabolic risk stratification (2) but, among other factors, discrepancies as consequence of varying methodologies avoid its application and generalization into daily clinical practice. In addition, EFT variation with ethnicity has also been suggested, (3, 4) and they could influence in the lack of uniformity to obtain a normal upper-limit value for EFT.

Similar results to those reported by Shemirani et al. (1) were highlighted in a previous study that also demonstrated a significant and independent association between EFT measured at end-systole by 2D-echocardiography and coronary artery disease in a Cuban population (5). EFT ranged from 1 to 18 mm and was significantly increased in patients with coronary artery disease compared to those with normal coronary arteries (6.6±2.8 vs 4.7±2.3 mm, p=0.009). EFT >5.2 mm had the best sensitivity and specificity to predict coronary artery disease documented using invasive coronary angiography as a gold standard (AUC=0.712).

In addition to the report of Shemirani et al. (1), more studies are needed using state of the art methodology with measurement of EFT at end-systole. In spite of the disparity of current observational cross-sectional reports, further longitudinal studies looking at the predictive value of EFT could be a good starting point for a consensus.

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Author's Reply

Dear Editor,

Thanks for comments, several points should be noted:

First, as mentioned in the limitations of study, the exact size of epicardial fat thickness (EFT) was not determined. In the letter to editor, EFT of Cuban population was 1-18 mm and EFT>5.2 mm was the risk factor, but in each population EFT size may be different because of racial differences. Of course in our study EFT, independently was related with coronary artery disease.

Second, the exact EFT size could be determined with use of 3- dimensional echocardiography, computed tomography, magnetic resonance imaging, although transthoracic echocardiography is also valid (1). Other study with exact modalities is recommended.

Third, detection of EFT in systole is more reliable than diastole. According to the mentioned article (2) and acceptable techniques. Nevertheless, diastolic view was the most cited. It appears necessary to study correlation between systole and diastolic measurement and their validity for coronary artery disease.

Conclusion, EFT can be a risk factor for coronary artery disease but a meta-analysis study for correlation EFT and coronary artery disease seems necessary.

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Dirençli hipertansiyon hastalarında perkütan renal denervasyon işlemi-Türkiye'de ilk deneyimler

Percutaneous renal denervation in patients with resistant hypertension-first experiences in Turkey

Sayın Editör,

Derginizde yayınlanan Bilge ve ark. (1) tarafından yazılan 'Dirençli hipertansiyon hastalarında perkütan renal denervasyon işlemi-Türkiye'de ilk deneyimler' isimli çalışma gerçekten de gelişen perkütan kardiyoloji işlemleri açısından hepimize yol gösterecek ve girişimsel kardiyologları cesaretlendirecek niteliktedir. Toplum sağlığını oldukça ilgilendiren ve sonlanım noktaları bakımından çeşitli morbidite, engellilik ve mortalite etkisi olan hipertansiyon hastalığının tedavisi oldukça önemlidir. Yazarların kaleme aldığı çalışmadaki hastaların tansiyon düşüş değerleri rakamsal olarak yoğun gözükmese de klinik olarak oldukça önemli olduğu bilinmektedir. Dirençli hipertansiyon tanımında geçen diüretik dahil olmak üzere en az üç anti-hipertansif ilacın optimal dozda uygulanmasına rağmen hedeflenen arteryel tansiyon değerlerine ulaşılmasında başarılı olunamamış mıdır? İkincil olarak son ESC hipertansiyon kılavuzunda belirtildiği üzere dirençli hipertansiyon tedavisinde önerilen