Reviewer's report

**Title:** Predictor of Poor Coronary Collaterals in Chronic Kidney Disease Population with Significant Coronary Artery Disease

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**Reviewer:** Murat Sezer

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Comments

In this submitted paper, authors had investigated the predictors of collateral vessel development in patients with chronic kidney disease (CKD). For this purpose, they had evaluated coronary angiographies of patients who had at least one vessel disease (in which there was at least more than 70% narrowing) at coronary angiogram. Collateral development had been assessed semi-quantitatively by means of a Rentrop classification (an angiographic grading system). At the end of the multivariate analysis, they concluded that hypertension and diabetes might have negative effect on collateral development in patients with CKD.

As authors stated in the manuscript, previous studies have already demonstrated that CKD was associated with poor coronary collateral vessel development in patients with coronary artery disease. In the current analysis, it has been shown that presence of hypertension and diabetes and the number of the diseased vessel would contribute poor collateral development in CKD setting. Although, a synergistic effect of diabetes and hypertension on poor collateral development has been additionally shown in this paper, all these factors (CKD, diabetes and hypertension) were already shown to be negatively related with collateral development in coronary artery disease in previous studies. Therefore, I'm not sure whether the findings of this current paper would provide a new understanding or aspect to our knowledge.

Specific comments:

1. Overall patient characteristics (Including hemoglobin level, smoking habits, previous coronary events etc.) should be provided in a separate table

2. Severity of coronary artery disease should be described more precisely. Assessment of coronary narrowing by using quantitative coronary angiography and including patients with more than 70% narrowing in a coronary artery is not enough for this study population. a) How many patients had multivessel disease? Please clarify, b) Severity score of the coronary artery disease should be calculated with using a known index such as Gensini Index.

3. As Authors stated in limitation section, Rentrop classification system is a semiquantitative angiographic grading systems for the assessment of coronary collateral development. Moreover, Rentrop scoring had been originally defined by double injection into both main coronary arteries and by balloon occluding
collateral receiving artery. Therefore, this scoring has important inherent limitations and in order to cope with its deficiencies, spontaneously visible collaterals could have been described with more details. For instance, describing angiographic collateral connection grades and pathways (angiographically) would have been very helpful.

4. In the presence of multivessel disease (more than one significant lesion), it is not clear why collateral scoring had only been performed by choosing the vessel receiving highest degree of collateral flow. Instead of this, collateral score could have been calculated by summing the Rentrop numbers for each patient.

5. How many patients had more than one collateral receiving artery? In other words, how many patients had multivessel disease?

6. It is hard to explain/understand the difference found between the number of disease vessel and collateral development. In Table 1, it seems patients with poor collateral vessel had numerically fewer vessel disease with compared to those with good collaterals. If the authors had calculated collateral score by summing Rentrop numbers of each collateral receiving artery, this finding would have been expected. Nevertheless, they calculated collateral score based on the vessel, which was receiving highest degree of collateral flow. Furthermore, in the presence of severe multivessel disease, it has been expected that the collateral supplying vessel could also be affected from the atherosclerotic process (as a part of multivessel disease), which eventually turn out to be poor collateral flow quality toward the collateral receiving artery. At this point, knowing the number of the patients who had multivessel disease and the disease status of the collateral-supplying vessel became more critical.

7. Were there any differences between collateral grades in different CKD stages?

8. Please include age as a variable in regression analysis.

9. Since the effects of diabetes and hypertension on collateral vessel development could have only been analyzed in CKD population, we cannot discriminate their effects from the effect of CKD. In other words, effects of hypertension and diabetes might have potentiated (exaggerated) by the CKD?