An invitation for rethinking about gamma-glutamyltransferase and its association with coronary collaterals

To the Editor,

In a recently published article in Anatolian Journal of Cardiology, Şahin et al. (1) reported a positive association with higher gamma-glutamyltransferase (GGT) levels and poor coronary collateral (CC) circulation in patients with chronic total occlusion (CTO). We have some comments about this study (Aren't there always?).

Coroner collateral artery development is usually attributed to ischemia but these anastomotic channels are also present individuals who do not have coronary artery disease (2). Currently, there is no non-invasive method for evaluating CC circulation in humans. The most widely used strategy is visual assessment of collateral arteries as described by Rentrop et al. (3). This method involves balloon occlusion of the contralateral coronary artery, which is rarely performed. In clinical practice, this method is usually applied without occluding the contralateral vessels. As a result, underestimation of collateralization is inevitable. Other limitations of this visual method include observer variability, influence by the blood pressure and the force of contrast injection as well as the duration of filming. The most accurate assessment could be obtained by measuring the pressure-derived collateral flow index (4).

Although the authors have mentioned that the relation between GGT levels and the degree of CCs in patients with CTO has not been studied before, this association was previously shown by Şarlı et al. (5).

GGT is an old enzyme and its high levels bring to mind firstly a problem with biliary epithelium, cholestasis, or excessive alcohol consumption. Perhaps, the association between serum GGT levels and CC circulation is not as robust as we thought.

Finally, the definition of CTO is highly challenging as why will we know duration of an occlusion more than or equal to three months?

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References

1. Şahin M, Demir S, Kalkan ME, Özkan B, Alıcı G, Cakalağaoğlu KC, et al. The relationship between gamma-glutamyltransferase and coronary collateral-circulation in patients with chronic total occlusion. Anadolu Kardiyol Derg 2013 Oct. [Epub ahead of print]
2. Seiler C. The human coronary collateral circulation. Eur J Clin Invest 2010; 40: 465-76. [CrossRef]
3. Rentrop KP, Cohen M, Blanke H, Phillips RA. Changes in collateral channel filling immediately after controlled coronary artery occlusion by an angioplasty balloon in human subjects. J Am Coll Cardiol 1985; 3: 587-92. [CrossRef]
4. Seiler C, Fleisch M, Garachemani A, Meier B. Coronary collateral quantitation in patients with coronary artery disease using intravascular flow velocity or pressure measurements. J Am Coll Cardiol 1998; 32: 1272-9. [CrossRef]
5. Şarlı B, Baktır AO, Sağlam H, Arınç H, Kurtul S, Akpek M, et al. The relation of serum γ glutamyl transferase levels and coronary collateral circulation in patients with chronic coronary total occlusion. Coron Artery Dis 2013; 24: 298-302. [CrossRef]

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Author`s Reply

To the Editor,

Thank you for the author's interest and constructive comments on the our paper titled with "The relationship between gamma-glutamyltransferase and coronary collateral circulation in patients with chronic total occlusion" published article in Anatolian Journal of Cardiology, Şahin et al. (1).

In the presence of coronary occlusion the quality of collateral circulation can be assessed angiographically using Rentrop classification or collateral connection (CC). Angiographic classifications has several limitations: first, it is not meant to analyze spontaneously visible collaterals of non-occluded arteries; second, only vessels greater than 100 μ in diameter are angiographically visible; third, the injection speed, contrast concentration, and catheter size can affect the quality of CC visualized (2). In the absence of total occlusion, the assessment of adequacy of collateral flow is determined by transient coronary occlusion using an angioplasty balloon catheter (3). Collateral flow index (CFI) as a quantitative assessment of collateral circulation. In this method collateral flow is determined by transient coronary occlusion using an angioplasty balloon catheter. CFI is defined as (Pd-CVP)/(PA-*CVP)(Pd: intracoronary mean distal pressure, PA: mean aortic pressure and CVP: central venous pressure) (4). In this procedure, the guide wire is exchanged with pressure guide wire after the lesion was crossed by a guide wire. Then transient coronary occlusion using an angioplasty balloon catheter Pd is recorded. As a result this technique requires pass the distal of occlusion with guide wire. This technique was not used in our study due to all patients did not undergo CTO recanalization.

Şarlı et al. (5) article published in June 2013. Our article was submitted to Anatolian Journal of Cardiology at November 2012 and it was accepted March 2013. So at that time GGT levels and the degree of coronary collateral circulation in patients with CTO has not been studied before.

Serum GGT activity is generally used as an indicator of liver function. Also alcohol consumption, non-alcoholic fatty liver disease and cholestasis are the most important causes of elevated liver enzymes. But in our study; patients with obvious hepatic or cholestatic disease and alcohol consumption were excluded. However, liver biopsy and abdominal ultrasonography were not used for detecting fatty liver disease in this study. In addition alcohol consumption was based on patients reported, which might not be reliable. These limitations emphasized in the section of study limitations.

In our study CTO is defined by the Euro CTO Club (6). Estimates of the duration of coronary artery occlusion in the our study were based on a previous angiogram (in 106 patients), on a patient's angiographic or clinical evidence. A history of myocardial infarction within the last three months and recent acute coronary syndrome were excluded from the study. Also stable anginal symptoms changed in the last three months were exluded. So the duration of occlusion was more likely to be 3 months.

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References

1. Şahin M, Demir S, Kalkan ME, Özkan B, Alıcı G, Cakalağaoğlu KC, et al. The relationship between gamma-glutamyltransferase and coronary collateral-circulation in patients with chronic total occlusion. Anadolu Kardiyol Derg 2013 Oct. [Epub ahead of print]
2. Karrowni W, El Accaoui RN, Chatterjee K. Coronary collateral circulation: Its relevance. Catheter Cardiovasc Interv 2013 Mar 4. [Epub ahead of print]. [CrossRef]
3. Coggins MP, Sklenar J, Le DE, Wei K, Lindner JR, Kaul S. Noninvasive prediction of ultimate infarct size at the time of acute coronary occlusion based on the extent and magnitude of collateral-derived myocardial blood flow. Circulation 2001; 104: 2471-7. [CrossRef]
4. Pijls NH, van Son JA, Kirkeeide RL, De Bruyne B, Gould KL. Experimental basis of determining maximum coronary, myocardial, and collateral blood flow by pressure measurements for assessing functional stenosis severity before and after percutaneous transluminal coronary angioplasty. Circulation 1993; 87: 1354-67. [CrossRef]
5. Şarlı B, Baktır AO, Sağlam H, Arınç H, Kurtul S, Akpek M, et al. The relation of serum γ glutamyl transferase levels and coronary collateral circulation in patients with chronic coronary total occlusion. Coron Artery Dis 2013; 24: 298-302. [CrossRef]
6. Di Mario C, Werner GS, Sianos G, Galassi AR, Büttner J, Dudek D, et al. European perspective in the recanalization of Chronic Total Occlusions(CTO): consensus document from the EuroCTO club. Euro Intervention 2007; 3: 30-43.

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Right ventricular functions in obstructive nasal polyposis

To the Editor,

We have read with great interest the article entitled "Evaluation of right ventricular functions in patients with nasal polyposis: an observational study" by Şimşek et al. (1) as it highlighted an important issue about the effect of nasal polyposis and nasal obstruction on cardiac functions specially the right ventricle and stress on the idea that hypoxia resulted from nasal obstruction has harmful effects on cardiac functions.

We have some considerations;

First regarding study design in the methods section, authors had informed that the type of study was cross sectional prospective study, however prospective study is a kind of study where an outcome or event is studied and measured for its occurrence in a specific period or time and as far as we read the article authors did not measure an outcome in a specified period of follow up.

The correlation between hypoxia due to upper airway obstruction and deterioration of cardiac functions had been already proved, however we have a great interest to know if there is a correlation between the degree of obstruction and the peak systolic pulmonary artery pressure as the authors choosed different levels of nasal obstruction in their study population, Stage 2: Intermediate polyposis, and Stage 3: Severe polyposis.

This study gains its importance from being the first which discuss the relation between the presence of nasal polyposis and its grades with the right ventricular functions where it concludes that patients with nasal polyposis who are clinically asymptomatic and have normal right ventricular functions with conventional echocardiography have subclinical right ventricular longitudinal dysfunction with strain and strain rate echocardiography. We would prefer to know the arterial blood gases results regarding arterial oxygen tension and hypoxia level along with its correlation with nasal polyps grading. Finally we propose the multivariate regression analysis as a statistical method to know if nasal polyps are dependent or independent from hypoxia as a cause of subclinical right ventricular functions deterioration along with if surgical removal of nasal polyps has a good prognostic effect on the right ventricular functions or not.

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References

1. Şimşek E, Şimşek Z, Taş MH, Kucur C, Günay E, Üçüncü H. Evaluation of right ventricular functions in patients with nasal polyposis: an observational study. Anadolu Kardiyol Derg 2013; 13: 251-6.

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Author`s Reply

To the Editor,

We thank for interest and positive reviews in our article published in the Anatolian Journal of Cardiology (1).

Nasal poliposis is a chronic inflammatory disease and the most common cause of nasal mass which leads to nasal obstruction. The most commonly used staging method is made by endoscopic appearence. For this staging method, Stage II defined as the polip which protrudes under the middle concha and could be seen without an endoscope, and Stage III defined as massive poliposis (2). In our article comparison of Stage 2 and Stage 3 NP patients revealed that only the SR value for the RV mid segment was significantly different (p=0.02); other segments did not show a significant difference in S and SR values (1).

Hypoxi and hypercapnia reported in various studies with patients who had nasal obstruction arised from a disease or an anterior and/or posterior nasal packing (3, 4). Despite the fact that arterial blood gas analysis is an objective method for determining hypoxemia, but also this is an invasive method. The studies which evaluated the cardiac effect before and after the operation in nasal poliposis patients report-