Images in Cardiology

Entwined Pattern of Coronary Arteries

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A 67-year-old asymptomatic man with a history of the Bentall procedure 20 years ago for aortic root dilatation and severe aortic regurgitation underwent a routine evaluation, for residual aortic root dilatation, by coronary computed tomography angiography. The image analysis highlighted a crossing of the mid left circumflex (thin white arrows) with the obtuse marginal artery (wide black arrows) in their proximal segments both in volume rendering (Supplemental Figs. S1 and S2) and in maximum intensity projection (Supplemental Fig. S3) reconstructions. The basic information about the scanner and the scanning protocol is available in Supplemental Appendix S1.

Very few cases of crossing coronary arteries have been previously described in the literature, and it remains considered as a normal variant of coronary anatomy.¹ Other coronary arteries, as left anterior descending and diagonal branches, may also be involved.² It's frequently a fortuitous diagnosis as performing coronary computed tomography angiography or coronary angiogram for another purpose. There is currently no evidence of functional significance attributed to this condition. Precise data on epidemiology remain unknown.

We herein add a supplementary exception to the generally accepted anatomic postulate describing the major branches of the coronary arteries running parallel to one another without any crossing pattern.³

Albeit mostly asymptomatic, this condition may have a therapeutic impact by influencing the revascularization strategy either by percutaneous coronary intervention or coronary artery bypass grafting in multivessel disease involving left circumflex coronary artery branches. Indeed, crossing coronary arteries suggest that one vessel may be intramyocardial and thus cannot be bypassed.⁴ In such cases, it has been proposed to perform an arterioarterial shunt at the crossing point in case of a significant stenosis involving the proximal

Novel Teaching Points

- Major branches of the coronary arteries may cross each other rather than running parallel to one another as generally stipulated.
- Crossing coronary arteries may influence the revascularization strategy, especially when coronary artery bypass grafting is planned.

segment of one branch⁵ when coronary artery bypass grafting is planned, provided the other is healthy.

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Disclosures

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References

1. Trivellato M, Angelini P, Leachman RD. Variations in coronary artery anatomy: normal versus abnormal. *Cardiovasc Dis, Bull Tex Heart Inst* 1980;7:357-70.
2. Pandey NN, Sharma A. A curious case of crossing coronary arteries. *Asian Cardiovasc Thorac Ann* 2020;28:219.
3. Silverman JF. *Coronary Angiography*. Menlo Park, CA: Addison Wesley, Inc., 1984:66.
4. Bilazarian SD, Jacobs AK, Fonger JD, Faxon DP. Case report of a coronary anomaly: crossing obtuse marginal arteries. *Cathet Cardiovasc Diagn* 1991;23:130-2.
5. Muyldermans LL, van den Heuvel PA, Ernst SM. Epicardial crossing of coronary arteries: a variation of coronary arterial anatomy. *Int J Cardiol* 1985;7:416-9.

Supplementary Material

To access the supplementary material accompanying this article, visit *CJC Open* at <https://www.cjopen.ca/> and at <https://doi.org/10.1016/j.cjco.2020.09.006>.

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Ethics Statement: The case we report here has adhered to the relevant ethical guidelines.

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See page 127 for disclosure information.