

## Myocardial bridging: what do we really know?

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Myocardial bridging (MB) is one of the most common congenital coronary anomaly.<sup>1</sup> In this lecture, four angiographic findings of my patients are presented. Each with LAD bridging and anginal complaints. Previous studies show that this phenomenon could be responsible for the development of myocardial ischemia. The part of the vessel proximal to the bridging is subject to atherosclerotic changes, while the tunneled part is usually spared. Hemodynamic forces could be the reason for such an atherosclerotic distribution of plaques. This is supported by studies on a cellular level. It was proven by histological analysis that foam cells and modified smooth muscle cells are missing in the tunneled part, while they are normally found in the remaining parts of the vessel. And the structure of the endothelium itself speaks in favor of different pressure loads inside the vessel. In the proximal part the endothelium is flat and polymorph, indicating low shear stress, whereas in the tunneled segment, the endothelium has a helical, spindle-shaped orientation which indicates the existence of laminar flow and presence of high shear stress. Low shear stress may trigger the release of endothelial vasoactive agents such as endothelin-1 (ET-1) which is known to participate in the pathogenesis of atherosclerosis at all stages. Although it doesn't seem like it, myocardial bridging is not just a systolic phenomenon but a systolic-diastolic one. Intravascular ultrasonographic and doppler measurements showed that during diastole in these vessel segments there is a form of delayed relaxation with slowed flows especially during episodes of tachycardia. Today fractional flow reserve is the "gold standard" in assessing the hemodynamic significance of fixed lesions but it can fail to assess the importance of "dynamic" stenoses. For the non-invasive functional diagnostics (CMRI, SPECT, PET) there are not enough studies or clear criteria. Pharmacotherapy is the strategy of first choice, beta blockers in the first place and non-dihydropyridine calcium channel blockers in the second place. In case of unsuccessful drug therapy revascularization is the options. However PCI carries a high degree of complications, CABG is the procedure of choice in case of complex anatomy, while myotomy is the procedure of choice in the pediatric population.

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### LITERATURE

1. Ciliberti G, Laborante R, Di Francesco M, Restivo A, Rizzo G, Galli M, et al. Comprehensive functional and anatomic assessment of myocardial bridging: Unlocking the Gordian Knot. *Front Cardiovasc Med.* 2022 Nov 8;9:970422. <https://doi.org/10.3389/fcvm.2022.970422>