

## CORONARY ARTERY DISEASE

### Myocardial bridge: a ‘double-edged sword’ in atherosclerosis

Myocardial bridge (MB)—where a segment of the left anterior descending coronary artery is covered by muscle tissue—is a common phenomenon that is often clinically silent. However, some patients experience myocardial ischemia, either as a result of pressure on the artery during systole or because of atherosclerosis in the arterial segments proximal to the bridge. Ishikawa *et al.* report that MB anatomy has a major influence on the development and localization of atherosclerotic lesions, and predisposes the patient to ischemia.

The investigators studied 100 hearts obtained at autopsy of individuals who had died from myocardial infarction, 46 of which had an MB, and 200 hearts (100 with an MB and 100 without) obtained at autopsy of age-matched and sex-matched individuals unaffected by ischemia. The length of the MB and the MB muscle

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index (length multiplied by thickness) was significantly greater in hearts with infarction than in infarct-free organs. Although atherosclerosis was present to a similar extent in infarcted hearts with or without an MB, the presence of MB was associated with a characteristic pattern of severe stenosis in the segment proximal to the bridge and toward the coronary ostium. By contrast, the area directly under the MB seems to be ‘protected’ from the development of atherosclerosis. Ishikawa *et al.* hypothesize that hemodynamic alterations during MB contraction cause changes in the

shape of endothelial cells beneath the bridge that suppress atherosclerotic progression; however, contraction also induces retrograde blood flow in the proximal arterial segment, which increases susceptibility to lesion development.

From a clinical perspective, physicians “should determine the ... anatomic properties of [the] MB underlying the occurrence of coronary heart disease by follow-up study of [these] patients using multidetector CT”, says Dr Ishikawa. In terms of reducing the effects of MB contraction on the proximal segment of the artery, “the use of  $\beta$ -blocker [therapy] or myotomy of the MB muscle may be effective”, he concludes.

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**Original article** Ishikawa, Y. *et al.* Anatomic properties of myocardial bridge predisposing to myocardial infarction. *Circulation* 120, 376–383 (2009).