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## Commentary: Expecting the unexpected

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Coronary artery anomalies (CAAs) are a group of congenital disorders with an incidence ranging from 0.61% to 5.64%<sup>1,2</sup> of the overall population. These anomalies can be broadly classified based on the location of the coronaries; the number of ostia; their proximal orientation and origin; their branching and termination; and the course of the arteries. Although the normal course of a coronary artery is subepicardial, known variations include an intramural course (ie, myocardial bridging<sup>3</sup>); an intracavitary course (within the cardiac chamber); and an aerial course above the heart (Figure 1).<sup>4</sup> These anomalies can have clinically relevant manifestations, including myocardial ischemia, as demonstrated by the illuminating case report in this issue of the *Journal*.<sup>5</sup>

In the featured article, D'Angelo and colleagues<sup>5</sup> present an intriguing case of a patient with chest pain corresponding with a presumed diagnosis of a myocardial bridge. Preoperatively, findings on a positron emission tomography–computed tomography scan revealed a perfusion defect in the distal left anterior descending coronary artery (LAD) territory. However, also of interest, left-heart catheterization showed only a 30% stenosis and a relative flow reserve of 0.91. Given the patient's refractory symptoms and poor tolerance for medical therapy, operative intervention was ultimately chosen. What the team encountered next defines our most challenging scenario. For intraoperatively, the team encountered an unexpected and intriguing finding:

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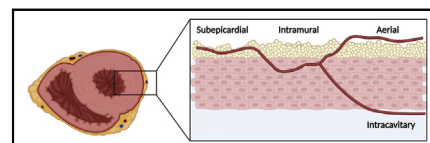
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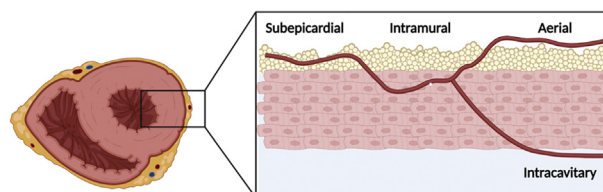
Possible variations of anomalous coronary courses.

### CENTRAL MESSAGE

Expecting the unexpected in the operating room leads to successful operative outcomes.

instead of a myocardial bridge, the abnormal segment of the LAD was superficial to the epicardium in an aerial configuration. Given its mobility, the LAD segment exhibited dynamic kinking. As previously described by Hemmati and colleagues<sup>6</sup> in relation to a different indication, the LAD segment was stabilized with pledgeted mattress sutures and passed from the left ventricle to the right ventricle beneath the artery.

The case described by D'Angelo and colleagues is novel, interesting, and instructive. The lesson, however, is not related so much to the technical aspects of the case as to its cognitive dimension. Indeed, the pledgeted repair had been previously prescribed for a different CAA<sup>5</sup> and was hardly unique. Instead, the team is to be commended for their composure in the operating room and their adaptability to an unanticipated scenario. The preoperative diagnosis of myocardial bridging, which is a relatively common CAA, was incorrect. The actual diagnosis of an aerialized coronary artery, which is exceedingly rare and does not have a readily available surgical solution, challenged the team in real-time to adapt. A team with a lesser ability to think outside the box while under pressure might have become unnerved and reacted inadequately, but Dr Craig Smith's team remained calm in the face of the unknown, enabling them to take a step back, thoughtfully assess the unscripted



**FIGURE 1.** Possible variations of anomalous coronary courses. Conceptual representation of different anomalous coronary courses, which include an intramural course within the myocardium, intracavitary course within the chamber of the cardiac chamber, and a superficial aerial course above the heart. The typical subepicardial course is represented on the left.

circumstances, and delve more deeply into the realm of their training and experience to divine a solution. The result was the carefully tailored surgical therapy worthy of this most interesting and engaging article. Given the ability of Dr Craig Smith's team to expect the unexpected, they arrived prepared at the scene of the unknown. It is not surprising that this case had a successful outcome.

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