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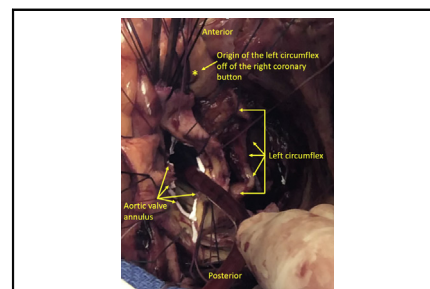


Commentary: Be ready to re-route your root replacement

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In this issue of the *Journal*, Drs Fukunaga and Peterson report a case of an anomalous left circumflex coronary artery originating from the right coronary artery and coursing lateral and then posterior to the aorta, identified during planning for intervention on an aortic root aneurysm.¹ They successfully replaced the aorta from the root to the innominate artery, sparing the valve with a root remodeling procedure without intervention on the anomalous coronary artery (ACA). Such anatomy and pathology occur often enough to be encountered a few times during a surgical career. Occasionally the preoperative investigation does not provide sufficient information to determine exactly what will be needed to fashion the repair. The ability to follow an alternative strategy is valuable to the operating surgeon. Central to this is an understanding of the risks of anomalous coronary arteries and their interventions, in addition to those associated with root surgery.

The operation performed was a remodeling valve-sparing root replacement (VSRR) that did not require an annuloplasty because of the presence of a nondilated annulus. Compared with a reimplantation VSRR, less dissection is required around the aortic annulus where the ACA was located. Had the annulus been dilated, other options could have been considered. These include an annular reinforcement procedure in addition to the remodeling VSRR, a reimplantation VSRR, or a composite valved conduit. To varying degrees, these all carry some risk to the left circumflex ACA. Mobilization of the ACA may be sufficient to



An anomalous left circumflex coronary artery arising off a right coronary artery button.

CENTRAL MESSAGE

Being able to follow an alternative strategy for anomalous anatomy is valuable and requires an understanding of the underlying lesions, their treatment, and potential difficulties.

remove it from jeopardy, but in rare instances, relocation of the ACA or revascularization of the ACA may be necessary.

To decrease the diameter of the annulus, support it over time, and improve the coaptation height of the leaflets, the annular repair could have included a subannular stitch annuloplasty, an internal geometric ring annuloplasty, or an external annuloplasty. The former is used less often, likely because of concerns for durability. The internal geometric rings are newer innovations that show promise and do not require the same deep external aortic dissection needed in external ring annuloplasty.² If an external annular procedure is being added to the remodeling procedure, a reimplantation procedure can be done instead, as it requires the same anatomic dissection. A valved conduit is another option, as it also does not require the same external dissection as the VSRR, thereby exposing the ACA to less jeopardy from kinking or direct injury. Furthermore, a valved conduit should not always be considered a lesser procedure. Evidence exists suggesting that the durable competency of an aortic valve-sparing procedure is impacted by the presence of a large indexed left ventricular end-systolic dimension.³ In a severely dilated left ventricle, a valved conduit may be a good choice.

ACAs are not all alike, and some are of greater concern than others. A left main coronary artery off a right sinus is more concerning for sudden death than a right coronary coming off a left sinus.⁴ An individual left circumflex

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coming off a right coronary artery is not as concerning; however, certain high-risk features, such as a slit-like ostium and a long intramural course, might require additional consideration for unroofing, relocation, or bypass.⁵ As was done in this case, often it only requires mobilization of the ACA, with care not to take annular bites too wide to kink the vessel or too deep to injure it.

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