

# What if “Cabrol” Lost Half of Its Mustache?



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In this issue of the Journal, Dr Cheng proposes the use of aortic graft side branches to facilitate coronary reconstruction or extend coronary artery bypass grafts.<sup>1</sup> He reports 6 reoperative settings in which difficult mobilization of coronary buttons or proximal bypass grafts were revascularized with a reperfusion limb of a Dacron graft. This clinical scenario remains rare (6 out of 234 aortic root replacement procedures during the same period) but constitutes a true surgical challenge.

The technique of the coronary button allows for a full thickness aortic wall, tension free anastomosis between the coronary artery and the composite graft obviating the bleeding and pseudoaneurysm complications encountered with the classic Bentall procedure. However, coronary artery mobilization in reoperative root procedures or heavily calcified roots may be difficult or merely impossible. In such circumstances, Cabrol proposed in 1981 the creation of a “mustache-shaped” interposition graft with an end-to-end anastomosis on each coronary artery and as inflow, a side to side connection on the right lateral surface of the composite graft. Technical difficulties were mainly reported with kinking of the right-sided limb of the mustache leading to low flow with occasional graft thrombosis.<sup>2</sup>

Modifications of the Cabrol technique were proposed and are still considered as excellent bailout procedures when facing embedded or calcified coronary arteries.<sup>3</sup> Direct anastomosis between each coronary artery and the composite aortic graft using 2 short separate grafts avoids the “delicate” positioning of the mustache side to side connection. A modification of this technique for the left coronary artery uses a longer graft anastomosed higher on the right lateral side of the composite graft. This technique, equivalent to a Cabrol procedure amputated of its right limb, offers the advantage of administering cardioplegia and verifying hemostasis of the left main following completion of the anastomosis. Appropriate graft length is tailored by gently releasing the aortic clamp once the distal anastomosis is performed. Use of a reperfusion limb of a Dacron graft



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### Central Message

Inflow through a graft reperfusion branch is a valuable option to revascularize difficult coronary arteries.

as inflow instead of an anastomosis on the right lateral side of a composite graft is suggested by Cheng. The author also describes the use of such an inflow graft for old fixed bypass grafts, which cannot reach the composite graft. Although novel, a few limitations and concerns should be raised. Mainly when used to revascularize the coronary ostium, such grafts are lengthy and prone to kinking. Increase risk of thrombosis may occur during hypotensive periods especially if the coronary bed run off is hampered by stenosis. Furthermore, as visualized in the figures, these reperfusion limbs originate near the distal anastomosis, which may complicate management in a reoperative setting. Thorough description within the operative note and protocol of the graft take off, trajectory, and ending are essential to facilitate future catheterization or open reoperation.

In conclusion, Cheng reports an innovative alternative to reconstruct difficult coronary arteries in a complex reoperative setting. This technique may be added to the modifications of how to “trim” the mustache of a Cabrol procedure. However,

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knowledge of the limitations and downsides of the technique and late patency results are mandatory.

### REFERENCES

1. Cheng YT, Leb JS, Bloom M, et al: Use side branch of the aortic graft to facilitate coronary reconstruction during complex aortic surgery. *Semin Thorac Cardiovasc Surg*. <https://doi.org/10.1053/j.semtcvs.2018.09.028>
2. Knight J, Baumüller S, Kurtcuoglu V, et al: Long-term follow-up, computed tomography, and computational fluid dynamics of the Cabrol procedure. *J Thorac Cardiovasc Surg* 139(6):1602–1608, 2010
3. Kourliouros A, Soni M, Rasoli S, et al: Evolution and current applications of the Cabrol procedure and its modifications. *Ann Thorac Surg* 91:1636–1641, 2011