Commentary

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Journal of Vascular and Endovascular Therapy

2020
Vol. 5 No. 2: 13

Commentary on Direct Open Retrograde Revascularization for Mesenteric Ischemia

Nathan Orr, Michael Bounds, Daniel Badia and Eric Endean*

Department of Surgery, University of Kentucky College of Medicine, Kentucky, USA

Received: May 15, 2020, **Accepted:** June 05, 2020, **Published:** June 12, 2020

***Corresponding author:**
Eric Endean

edende0@uky.edu

Department of Surgery, University of Kentucky College of Medicine, Kentucky, USA

Citation: Orr N, Bounds M, Badia D, Endean E (2020) Commentary on Direct Open Retrograde Revascularization for Mesenteric Ischemia. J Vasc Endovasc Ther. 5 No. 2: 13.

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Many clinicians would consider an endovascular approach for the treatment of both acute and chronic mesenteric ischemia caused by atherosclerotic disease as their first line therapy. In patients with acute mesenteric ischemia, direct access of the superior mesenteric artery (SMA) with retrograde angioplasty and stenting has been proposed as being preferable to bypass [1,2]. Likewise, in patients with chronic mesenteric ischemia, angioplasty and stenting has been recommended as "first-choice treatment" [3]. We would agree that when possible and appropriate, a minimally invasive approach should be utilized; however, there are circumstances when such procedures cannot or should not be done. Mesenteric atherosclerotic disease often is an extension of associated aortic plaque. As such, a potential and perhaps a relatively common problem with retrograde stenting is that a sub intimal plane is entered in the mesenteric vessel and the wires and catheters remain in this plane without re-entry into the aortic lumen. Additionally, many patients have flush occlusion and/or long segment occlusions that cannot be crossed in an antegrade fashion. In these patients a bypass is required to re-establish normal perfusion to the bowel.

Traditionally, it has been taught that the optimal bypass configuration is an antegrade bypass originating from the supra-celiac aorta is optimal and extending to both the SMA and the celiac arteries [4,5]. If there is no concern for contamination, use of a prosthetic graft such as a bifurcated Dacron graft is recommended. Others, however, have advocated for a retrograde bypass with the bypass originating from the infrarenal aorta or an iliac artery, often with revascularization to only the SMA [6]. While it has been shown that each of these approaches can successfully treat patients with mesenteric ischemia, there are potential technical difficulties with each, resulting in some clinicians to advocate for one approach over the other.

Those who advocate for an antegrade bypass will correctly point out that while the infrarenal aorta and iliac arteries are often diseased, the supra-celiac aorta is reliably free of severe atherosclerosis, thus assuring normal inflow into the graft. However, the supra-celiac aorta can be challenging to expose, even in patients who have lost significant weight. Additionally, placement of a supra-celiac clamp, even if partially occluding, can result in increased cardiac stress in patients who often have associated cardiac disease. Those who advocate for a retrograde bypass describe the creation of a c-loop so that the anastomosis to the SMA is made in an antegrade fashion. Unfortunately, it is difficult to determine the precise amount of redundancy to build into the graft; too much or too little redundancy can at least in theory result in kinking of the graft and lead to graft failure.

We have modified the retrograde mesenteric bypass technique, creating what we have termed direct open retrograde revascularization (DORR) [7]. Instead of creating a c-loop, we tunnel the graft from an iliac artery, through the small bowel mesentery, directly to the SMA. In most of the patients (92%) in our report the bypass was done only to the SMA, but the technique can also include the celiac axis when it is felt that the both the SMA and the celiac artery require revascularization. In such cases, the anastomosis to the SMA is done in a side-side fashion, extending the graft to the hepatic artery by tunneling the graft through the transverse mesocolon. Using this technique, exposure of the supra-celiac aorta and the potential deleterious effects of aortic clamping are eliminated. Because of the direct configuration, there is no need to create a c-loop and thus complications due to graft redundancy are likewise removed. Another key aspect of our technique is the use of vein as the conduit. In our series, the DORR technique was utilized for patients with both acute and chronic mesenteric ischemia. The use of vein minimizes the risk of graft contamination and infection if bowel infarction is present. However, we stress that the vein must be of adequate caliber and as such, we favor the use of femoral vein as the conduit, as utilized in 76% of the patients in our report.

The obvious limitation for the DORR procedure is the presence of severe aorto-iliac disease, whether it be aneurysmal disease or occlusive disease. The most common issue in patients with mesenteric ischemia is the presence of severe atherosclerosis involving the aorta and iliac arteries. Frequently, in our experience, despite fairly severe calcification of these vessels, we were able to identify a site in one of the common or external iliac arteries that was suitable for the anastomosis and without inflow compromise. Interestingly, in two of the patients in our report, the bypass originated from a previously placed aorto-bifemoral graft. Since our report, we have successfully revascularized one patient with an infra-renal aortic occlusion by simultaneously constructing an aorto-bifemoral bypass and using the right limb of this graft for the inflow of an SMA bypass. Therefore, while we would agree that severe aorto-iliac disease may preclude the DORR technique, in our experience this is rare.

Another potential detractor from the DORR is our preferred use of the femoral vein as the conduit of choice. We feel that the long-term patency of a mesenteric bypass is of critical importance and thus emphasize that the optimal conduit be used. Greater saphenous vein (GSV), if of adequate diameter is an option. However, we often find that the diameter of the GSV, while adequate at the sapheno-femoral junction, becomes small in the proximal thigh. The femoral vein reliably has a good diameter with more than adequate length for creation of a bypass to both the SMA and hepatic arteries. Admittedly, it is more difficult and time consuming to harvest deep vein than the GSV. For this reason, we often employ two teams for these cases, one to expose the intra-abdominal vessels while the second team exposes and harvests the femoral vein. By using two teams, our operative time for the DORR was significantly less than that required for antegrade bypass.

When looking at our experience with open mesenteric revascularization, we have shifted from performing an antegrade bypass to the direct open retrograde revascularization. This has now become our preferred method for mesenteric revascularization. To date, we have had no long-term graft failures. Two patients have undergone endovascular intervention on the inflow vessel. One patient required angioplasty of an aorto-femoral limb, and later angioplasty and stenting of this graft limb to maintain inflow to the mesenteric graft. A second patient underwent angioplasty and stenting of common iliac artery atherosclerotic disease proximal to the origin of the mesenteric bypass. For this reason, we closely follow our patients who have undergone mesenteric bypass with regular surveillance imaging.

In summary, we feel that direct open retrograde revascularization for mesenteric ischemia is preferable to antegrade bypass as well as the traditional retrograde technique that utilizes a c-loop. We feel that the technique is applicable to both acute and chronic mesenteric ischemia, is durable, and is well tolerated physiologically by patients.

References

1 Wyers MC, Powell RJ, Nolan BW, Conenwett JL (2007) Retrograde mesenteric stenting during laparotomy for acute mesenteric ischemia. J Vasc Surg 45: 269-275.

2 Andraska E, Haga L, Li X, Avgerinos E, Singh M, et al (2019) Retrograde open mesenteric stenting should be considered an initial approach to acute mesenteric ischemia. J Vasc Surg 70: 21-22.

3 Fioole B, Van de Rest HJM, Meijer JRM, Van Leersum M, Van Koeverden S, et al (2010) Percutaneous transluminal angioplasty and stenting as first-choice treatment in patients with chronic mesenteric ischemia. J Vasc Surg 51: 386-391.

4 Hollier LH, Bernatz PE, Pairolero PC, Payne WS, Osmundson PJ (1981) Surgical management of chronic intestinal ischemia: a reappraisal. Surgery 90: 940-946.

5 McAfee MK, Cherry KJ Jr., Naessens JM, Pairolero PC, Hallett JW JR, et al (1992) Influence of complete revascularization on chronic mesenteric ischemia. Am J Surg 164: 220-224.

6 Illuminati G, Pizzardi G, Calio' FG, Pasqua R, Mascia F, et al. (2017) Infrarenal aorta as the donor site for bypasses to the superior mesenteric artery for chronic mesenteric ischemia: A prospective clinic series of 24 patients. Surgery 162: 1080-1087.

7 Huerta CT, Orr NT, Tyagi SC, Badia DJ, Richie CD, et al. (2020) Direct Retrograde Bypass is Preferable to Antegrade Bypass for Open Mesenteric Revascularization. Ann Vasc Surg.