Aortoaortic bypass pathophysiology

Interestingly, Dubois et al[1] report as a preferred solution after abdominal aortic stent graft explantation a new "anatomical" aortoaortic graft rather than a simpler aortobifemoral bypass. However, before any choice, particular anatomical conditions have to be considered, as an infrarenal aortic tract too short or with an angled neck, or heavy calcified femoral arteries, hampering respectively safe aorta-prosthesis anastomoses or a femoral graft implantation. Similarly, other functional situations, such as coronary bypasses, performed with both internal thoracic arteries in situ, or brachial hemodialysis vascular access, contraindicate axillary-bifemoral bypasses for the impending danger of a "steal." Another solution, although "para-anatomic" and more challenging, can be considered, consisting in an aortoaortic bypass, between the infradiaphragmatic aorta and its distal tract or iliac trunks, associated with excision of the infrarenal aorta (Fig, *A*). In the aortic stump, frail walls can be strengthened leaving inside the cephalic segment of the endograft.[2] This operation transforms the infrarenal tract of the abdominal aorta into a blind stump, creating two different vascular territories. The first, supported by the high pressure inflow of the graft, supplies the pelvic and lower limb arteries; the second, consisting of the celiac, superior mesenteric, and renal arteries, receives, from the aortic stump, a blood inflow with a lower kinetic energy, but sufficient for its well-compliant elastic vessels. They are in balance thanks to a mutual adaptation, or "hemometakinesis," that breaks in course of severe arterial hypotension or shock. Mainly the renal and digestive arteries become damaged through a mechanism of "steal," implemented by the upstream graft, and the action of adrenergic vasoconstrictors. It can follow a mesenteric ischemia and/or renal failure, typically acute, but sometimes "on chronic," in case of obstructive pathologies of the corresponding arteries. Different is the hemodynamics of an "extra-anatomic" aortoaortic bypass performed, without any aortic resection, between the thoracic and infrarenal aorta, commonly realized for coarctation of the thoracoabdominal aorta (Fig, *B*).[3] In this case, all the lateral and terminal branches of the abdominal aorta proportionally increase their blood supply, without any change in the system of distribution or increased danger of "steal" or competitive flow.[4] Practically, all this alerts to detect angiographically stenosis of the splanchnic and renal arteries before any aortoaortic, or aortobisiliac bypass, to carefully choose the most appropriate surgical strategy, and in open surgery to prevent any "steal" from oversized grafts. These pathophysiological elements become useful also in "hybrid" surgical procedures to indicate caveats and precautions; in perspective, they suggest further studies on the abdominal aorta hemodynamics.[5]

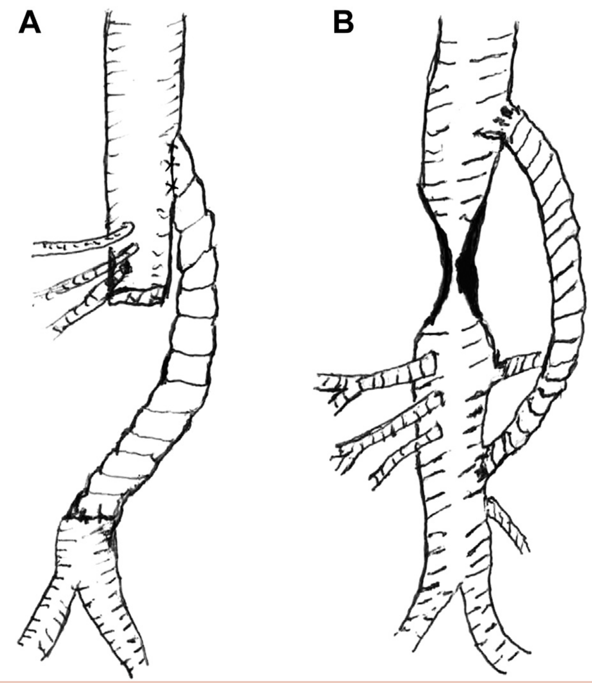

Fig. Surgical schemes. **A,** "Para-anatomical" aortoaortic bypass with excision of the infrarenal aorta. **B,** Extra-anatomical thoracoabdominal aortoaortic bypass.

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https://doi.org/10.1016/j.jvs.2021.09.053

Reply

We thank Dr Manenti et al for their careful reading of our paper and their interesting suggestions about the use of an aorto-aorto bypass using the supraceliac aorta as an inflow source. I do think that their opinion on the hemodynamic consequence of such a bypass is correct and that it would be a good anatomic option to optimize blood flow and would, no doubt, have better patency rates than an axillobifemoral bypass. I do, however, wonder how often such a configuration would be feasible in this patient population. The patients presenting with graft infection are typically sick and may not tolerate the prolonged supraceliac clamping that would be required for this approach, not to mention the possibility of having to potentially open both the chest and the abdomen to gain adequate exposure. Many of these patients are elderly, most being 40 months or more from their original endovascular aneurysm repair (EVAR) with an average age of 74 years, again indicating that they may not be ideal candidates for a more extensive aortic procedure.[1] As to the endoleak patients, they are often best treated with partial EVAR graft excision and inline reconstruction that would obviate the need for the more complex procedure Dr Manenti describes. In a similar multicenter study by Italian authors, only 6.5% of cases, 15 of 232 explants, underwent axillobifemoral bypass with most of the patients undergoing some form of inline reconstruction.[2] Again, these were done in infected patients who were unlikely to be physiologic candidates for the more extensive approach described here. Although we find your suggestion intriguing and perhaps there may be a select few patients who would be candidates for this, we think that most patients undergoing EVAR graft explantation will continue to be treated by the methods outlined in our paper, depending on the indication, anatomy, and physiologic suitability of each patient for the specific method of repair.

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https://doi.org/10.1016/j.jvs.2021.10.042

Systematic review of endovascular versus open repair of infected abdominal aortic aneurysm—bias in, bias out

The systematic review and meta-analysis of surgical treatment of infective native aortic aneurysms (INAAs, aka mycotic aortic aneurysms) by Shirasu et al[1] concludes that the 1-year survival is similar between open (OSR) and endovascular aortic repair (EVAR), and that recurrent infection is more frequent after EVAR. In our opinion, this study contains a number of methodological shortcomings and biases that may have a substantial adverse impact on the study's conclusions.

Consensus on the definition and diagnostic criteria of INAAs is lacking, although there are propositions in the literature.[2,3] There are no clear definition and diagnostic criteria used for INAAs included in this study, resulting in critical uncertainties regarding which studies were eligible.

To exclude studies published before 2010, and to only include studies that compare OSR and EVAR, important data from an era when open surgery was the predominant strategy for treatment of INAAs are excluded.[2] It also results in selection bias, where fit patients are selected to OSR, whereas less fit, unstable patients, or those with challenging anatomy, are treated with EVAR.

The main outcome, *recurrent infection*, is defined as "explant of grafts, abscess drainage, recurrent sepsis, aortoenteric fistula, and new infected aneurysms at remote sites." This joint outcome is highly dubious because it does not have an intercomparable impact on patient survival.

The study demonstrates a perioperative survival benefit of EVAR, and the authors claim that the survival after OSR and EVAR is similar at 1 year, a finding supposedly