Internal Cuff Reimplantation Technique for Aortic Branch Reconstruction

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Massive blood loss during thoracoabdominal aortic aneurysm repair may impair postoperative outcomes but can be reduced by a secure suture line. Our internal cuff reimplantation is a novel technique for the reconstruction of branch arteries with a cuff of the native aortic wall, which is anastomosed inside the prosthesis through a hole created in it. This technique can ensure hemostasis at the anastomosis by decompression of the suture line, improve patency of the reconstructed branches by leaving the diseased orifices untouched, and prevent future enlargement of the remnant native aortic wall by covering it with the prosthesis.

Comment

In techniques for the reconstruction of the branch arteries [3, 4], the native tissue is generally attached outward from the prosthesis, and suture lines on the native tissue are exposed. In this condition, the internal blood pressure can force the native tissue to separate from the prosthesis. The suture line is pressurized, and the fragile native tissue may be torn by the suture itself, resulting in bleeding. In contrast, we placed the anastomosis inside the prosthesis so that the native cuff was not pushed externally but compressed toward the prosthesis, resulting in the decompression of the suture line. There is frequently calcification, atheroma, or a lack of intima around the orifice of the branch arteries. Using a branched graft, an anastomosis placed near such a diseased orifice might impair patency and cause bleeding from the suture line. Moreover, additional hemostatic sutures could cause further impairment of the patency of the branches, especially in fine ones such as segmental arteries. In contrast, we separated the suture line from the orifice using a larger cuff and covered the suture line on the cuff with the prosthesis by leaving an appropriately sized gap between the cuff and hole. En bloc multivessel reconstruction such as the vascular tube [5] and island reconstruction [6] is a simple and timesaving procedure. However, there is a risk for future dilatation of the remnant native aortic wall. In contrast, we placed the native cuff inside the prosthesis to prevent future dilatation.

The potentially longer aortic clamping caused by incision and closure of the prosthesis could be associated with organ ischemia. However, the branches can be selectively perfused just before the completion of the closure even for the segmental arteries. In addition, for the prevention of spinal cord ischemia, we also adopted multisegmental sequential repair [7] with intraoperative monitoring of spinal cord function using evoked potentials [8]. In addition, we take care to determine the position of the branch hole because its malposition might cause traction or kinking of the reconstructed branches.

Internal cuff reimplantation for reconstruction of the branch arteries in thoracoabdominal aortic aneurysm repair is a novel technique that can ensure hemostasis at the anastomosis, improve patency of the reconstructed branches, and prevent future enlargement of remnant native aortic wall.

References