DEBATE: Advantages To Balloon Expandable Stent-Grafts For Aorto-Iliac Occlusive Disease: Why Is It Better Than Stenting And Open Surgery
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Introduction
According to existing guidelines surgical reconstruction is advised for bilateral and extensive aorto-iliac lesions (TASC-2 C/D). The development of new stent-related technologies and dedicated devices have expanded endovascular options in recent years. Endovascular options for aorto-iliac occlusive disease thus may have become an attractive alternative to surgery, also for more complex lesions.

The preference of surgical reconstruction is essentially based on the achieved long-term patency rates. A meta-analysis reported 5-year primary patency rates for aorto-bifemoral bypass of 86%, 85% for ilio-femoral bypass, and 88% for endarterectomy alone¹. The 30-day mortality rate for aorto-bifemoral bypass is 4% with an early local and systemic morbidity rates of 6% and 16%, respectively. There are also significant late complications including graft infection with an incidence of 0.7%, incision hernia incidence in 9.8% of cases² and postsurgical adhesions, that may cause small bowel obstruction and inadvertent enterotomies in case of a re-laparotomy. It is these complications that urge the search for minimal invasive alternatives.

As an alternative stents in a kissing configuration have often been used to treat lesions involving the aortic bifurcation. The one-year primary patency rates of kissing stents, mainly based on cohort studies, vary between 76-100% for bare metal stents with a morbidity rate of 6 to 24%, including distal embolization up to 8% of cases³. Various factors may affect the patency of kissing stents. After insertion of kissing stents, the outer stent lumen is still perfused, creating a stagnant blood column in the residual space, referred to as radial mismatch. This may cause thrombus formation and neointimal hyperplasia⁴,⁵. Moreover, stent protrusion in the distal aorta influences patency as does the crossover position of the stents⁶. These findings were endorsed by histopathologic findings of mesenchymal tissue, intimal hyperplasia and organizing thrombus in the residual space, within the lumen of the stents and at the level of the stent overlapping in the distal aorta⁷.

Covered stents
Results of endovascular treatment are limited by the occurrence of (in-stent) restenosis. Covered stents may shield stents from tissue ingrowth through stent interstices and consequently reduce re-stenosis. Case series have reported promising results that outline the benefit of covered stents in both iliac arteries and distal aorta. In 2012 we have reported our preliminary experience of covered stents used for isolated infrarenal aortic occlusive lesions⁸. An update of these data shows that, in a series of 21 patients treated with one single covered
balloon expandable stent, the primary patency rate remains 100% after a mean follow-up of 19 months.

The COBEST trial (Covered Versus Balloon Expandable Stent Trial) was the first randomized trial to compare bare metal stents with PTFE covered stents (Advanta™ V12, Atrium Medical, Hudson, NH, USA) in the management of iliac occlusive disease. A significant decrease in the incidence of re-stenosis and occlusions was found with the use of covered stents compared with bare stents in TASC C and D lesions. A historical cohort study has compared results of PTFE covered stents (Advanta™ V12) in the kissing stent configuration with the use of bare metal stents. After a median follow-up of 21 months, 22 out of 26 patients (85%) with covered stents had sustained improvement in clinical symptoms compared with 15 of 28 patients (54%) treated with bare metal stents (P=.02). Primary patency rates for covered stents at 1 and 2 years were both 92%, and 78% and 62%, respectively, for bare metal stents (P=.02).

Covered Reconstruction of the Aortic Bifurcation
The Covered Endovascular Reconstruction of the Aortic Bifurcation (CERAB) technique was developed to improve endovascular results in the treatment of lesions involving the aortic bifurcation by mimicking the anatomical and physiological situation of the aortic bifurcation using three covered stents (Advanta™ V12). Briefly, access is acquired to both common femoral arteries and sheets are introduced. After recanalization of the iliac arteries a 12 mm covered is expanded 15-20 mm above the aortic bifurcation. This stent is proximally adapted to the aortic wall with a larger balloon and afterwards two iliac covered stents are placed in this conic segment and simultaneous inflated. Both covered stents make a very tight combination with the aortic stent, as were they moulded together, simulating a new bifurcation.

Between February 2009 and February 2013, 76 CERAB procedures were performed in the ZNA Vascular Clinic (Antwerp, Belgium) and the Rijnstate Hospital (Arnhem, The Netherlands). Indications for treatment were chronic ischemia Rutherford category 2 (N=1), 3 (N=44), 4 (N=13), 5 (N=13) and 6 (N=1). In four patients the procedure was performed for acute limb ischemia Rutherford category 2a (N=2), 2b (N=1) and 3 (N=1). The mean age was 59±10 years and gender was equally distributed. Technical success was achieved in 93% of cases. Procedural complications consisted of two arterial wall perforations, that were treated with a self-expandable covered stent, seven non flow limiting dissections and one stent dislocation. Furthermore, eleven groin hematomas and two false aneurysms were treated conservatively and one patient developed non dialysis dependent renal function loss. One patient deceased within 30 days of operation due to a bilateral pneumonia. The main ABI increased significantly from 0.61±0.22 to 0.89±0.14 after treatment. Primary patency rate at 6 six months was 92% and at one year 86% with a secondary patency rate of 96% at both time points.

In conclusion, although surgical reconstruction is still the gold standard for extensive aortoiliac occlusive disease, developments in endovascular alternatives, including the CERAB technique, may change the treatment algorithm in the near future toward the use of covered stents.
References:


