CLINICAL STUDY

Endovascular Treatment of Occlusive Lesions in the Aortic Bifurcation with Kissing Polytetrafluoroethylene Covered Stents

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ABSTRACT

Purpose: To determine the clinical outcomes of polytetrafluoroethylene covered balloon expandable stents (CBESs) in occlusive lesions of the aortic bifurcation in a kissing stent configuration.

Materials and Methods: The study included 69 consecutive patients (29 men, 40 women) who underwent kissing stent procedures with CBESs between January 2003 and April 2009 in a single center. Patients who were previously treated with a CBES were excluded. Follow-up consisted of clinical investigation and duplex ultrasound examination.

Results: The primary patency was 88.1% at 1 year and 71.5% at 4 years, with secondary patency rates of 88.1% and 75.3%, respectively. For patients receiving a stent for the first time, primary patency was 91.3% at 1 year and 77.1% at 4 years. For patients who had received previous stents, patency was 83.6% at 1 year and 65.2% at 4 years ($P = .83$). There were no differences in secondary patency and freedom from target lesion reintervention (TLR). Loss of primary patency was mainly caused by stent occlusions (14 cases [78%]). The freedom from TLR at 4 years was 76.8%.

Conclusions: Patency rates and freedom from TLR of CBESs in the kissing stent configuration with up to 4 years of follow-up were satisfying and mainly affected by stent occlusions. Studies focusing on optimizing stent configuration and medical care to reduce the incidence of thrombosis are indicated to improve results further.

ABBREVIATIONS

ABI = ankle-brachial index, BMS = bare metal stent, CBES = covered balloon expandable stent, TASC = TransAtlantic Inter-Society Consensus, TLR = target lesion reintervention

Symptomatic occlusive lesions of the aortic bifurcation traditionally are treated surgically, when indicated. Patency rates are good, with primary patency rates up to 86% at 5 years (1). However, surgical interventions may not always be suitable in patients with comorbidities or with a hostile abdomen secondary to previous surgery. The reported 30-day mortality for aortobifemoral bypass is 4.1%, and local and systemic morbidity rates are estimated at 6.3% and 16%, respectively (1,2). Late complications may include incisional hernia, with an incidence of approximately 10%, sexual dysfunction with an incidence of 15%–25%, and small bowel obstruction caused by postoperative adhesion formation (3,4).

Endovascular procedures for aortoiliac occlusive disease include the kissing stent technique, in which bilateral iliac stents are deployed simultaneously (5–7). Cohort studies described patency rates of kissing stents between 73% and 100% at 1 year (8) and 65% at 4 years (9). Polytetrafluoroethylene covered balloon expandable stents (CBESs) may improve patency rates by preventing in-stent restenosis caused by tissue ingrowth and

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intimal hyperplasia (10–14). The aim of this study was to describe the performance of kissing CBESs for aortoiliac occlusive disease at the level of the aortic bifurcation after a follow-up of up to 4 years.

MATERIALS AND METHODS

Patients

The study included all patients treated with placement of kissing CBESs in the aortic bifurcation between September 2003 and April 2009 in a single center. There were 29 men and 40 women with a mean age of 59 years ± 9 included in the analysis. Data were retrospectively collected and anonymously analyzed. Retrospective research of patient medical records is not in the scope of the Dutch Law on Human Bound Research, and institutional review board approval was not required. As a consequence, patient informed consent was not obtained.

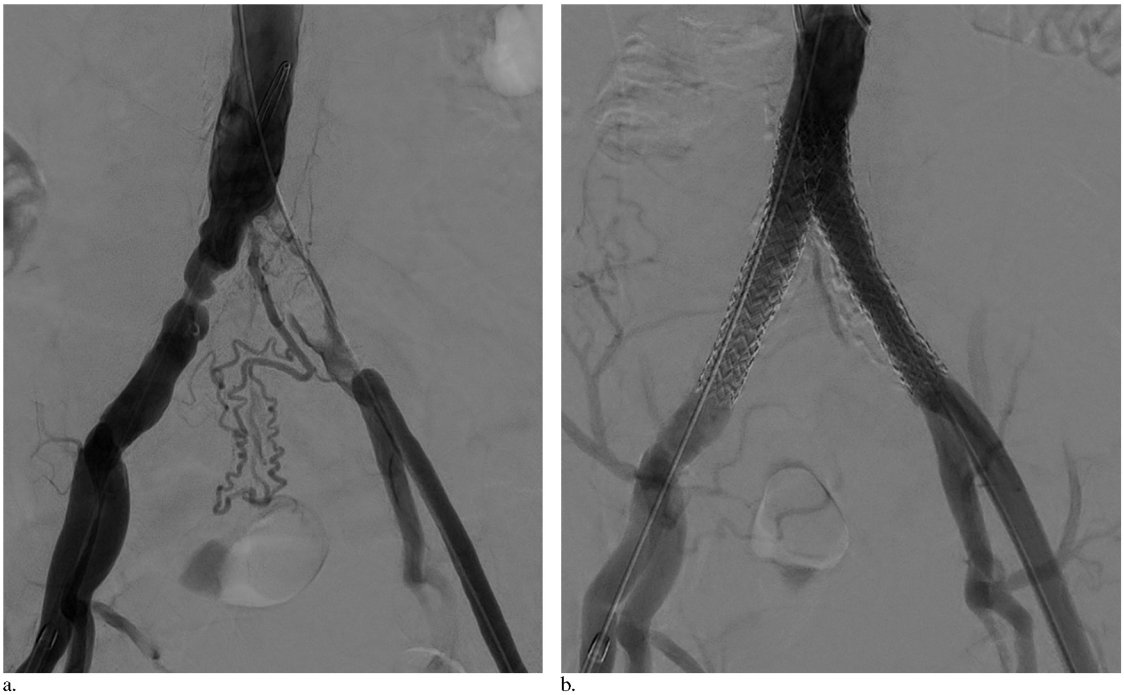
A primary stent placement strategy was used to perform approximately 400 procedures for iliac arteries using bare metal stents (BMSs) and CBESs. Patients previously treated with a CBES in the same segment were excluded from the analysis. During the study period, 73 kissing CBES procedures in 70 patients were performed. There were 42 primary procedures and 31 secondary procedures after previous endovascular interventions, including placement of 27 BMSs (4.6 y ± 3.1 earlier) and 4 covered stents. The latter four procedures were excluded from the study, leaving 69 patients for further analysis. One patient underwent BMS placement twice before treatment with kissing CBESs, whereas the other 26 patients had one previous BMS placed.

Patients' medical records were analyzed for medical history, demographic data, and comorbidities, which were graded according the medical comorbidity scoring system from the Society for Vascular Surgery and the American Association for Vascular Surgery (15). Intraoperative angiograms were reviewed for TransAtlantic Inter-Society Consensus (TASC)-II classification (16). Cardiovascular risk management, including the prescription of statins, was in accordance with national guidelines (17).

Procedure

All procedures were performed in one center by a single interventional radiologist. Procedures were performed under local anesthesia. Femoral access was obtained percutaneously. All patients received 5,000 IU of heparin intravenously. The Seldinger technique was used to introduce two 7-F sheaths, and after recanalization, two Advanta V12 stents (Atrium Medical, Maquet Getinge Group, Hudson, New Hampshire) were positioned at the aortic bifurcation and deployed simultaneously. When lesions extended distal from the kissing stents, additional stents were placed with minimal stent overlap. Angiographic images of a case example are provided in **Figure 1a, b**.

Postoperatively, all patients received single antiplatelet therapy using acetylsalicylic acid orally (80–100 mg). When warfarin or derivatives were indicated for other indications, no acetylsalicylic acid was added.



a. b.

Figure 1. **(a)** Preoperative angiogram of a 52-year-old man with disabling intermittent claudication, who did not respond to walking exercise and showed significant stenosis of the right common iliac artery and an occlusion of the left common iliac artery. **(b)** Angiography obtained after placement of two 8 mm × 58 mm Advanta V12 covered stents showing a patent flow through the iliac arteries. The ankle-brachial index increased from 0.65 to 1.10 on the left side and from 0.83 to 1.20 on the right side.

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