Original Article

Kissing Stents for Treatment of Aortoiliac Disease.

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Abstract

Objectives: To determine technical and clinical success of kissing stents for aortoiliac occlusive disease.

Design: Retrospective study.

Venue: Different private centers in Dhaka City.

Subjects: Patients presenting with intermittent claudication (IC) or critical limb ischaemia (CLI) due to aortoiliac disease.

Methods: Balloon or self expanding kissing stents with or without predilatation depending upon the nature of the disease, was inserted via bilateral retrograde femoral approach. Patients were followed up clinically and by ankle brachial index (ABI) and Duplex study.

Results: Technical and clinical success was achieved in all of 34 cases. All patients with CLI improved and ulcerated limbs showed complete healing. During follow-up 3 patients died and 1 patient required major amputation at 3 months.

Conclusion: Kissing stents implantation is a safe and alternative treatment for aortoiliac disease. It is cosmetic, requires short hospital stay. No incision, regional or general anesthesia is needed.

Key Words: Aortoiliac disease, Kissing stent, TASC classification.

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Introduction:

Traditional treatment of aortoiliac stenoses or occlusions is surgery. For focal lesions, aortoiliac endarterectomy and for more diffuse lesions aortobifemoral bypass are the choice. The durability of these procedures is excellent (85% to 90% at 5 years).[1] Reported operative mortality is 3.3%, whereas perioperative morbidity is 8.3%.[1-3] In spite of excellent patency rates, surgery is associated with anesthesia, prolonged hospitalization and recovery time, and loss of sexual function. Kissing balloon angioplasty is an alternative to surgery[1,2] , but there is significant incidence of dissection, thrombosis and residual stenosis[4,5]. The kissing stent technique which involves simultaneous implantation of two stents at aortic bifurcation is supposed to overcome these drawbacks.[6,7] With the refinement in stent technology, kissing stent technique has largely replaced kissing balloon angioplasty for the treatment of aortoiliac occlusive disease.

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Methods:

This is a retrospective study. Patients who underwent aortoiliac kissing stents were included in this study. Only lesions involving aortoiliac segment was included. Isolated unilateral or bilateral iliac lesions were excluded from the study. Associated aortic aneurysm was also excluded. Informed written consent regarding procedural details, risks and complications were taken from each patient.

Procedure:

All the patients were retrogradely approached via bilateral common femoral artery (CFA). 7F sheath was placed in both CFA. The lesion was crossed using 0.035 inch hydrophilic guide wire (Roadrunner® PC - Cook Medical, Bloomington, IN 47402-4195 USA) with or without the use of 4F straight diagnostic catheters. Preprocedural angiogram was done using 5F nonselective catheters. When lesions were crossed, 2 stents were advanced

bilaterally over the guidewires placed side by side in aortic bifurcation and implanted simultaneously (Figures-I, II, III).

Direct stenting was preferred over primary stenting. Predilatation was performed using 4 to 5 mm balloon dilatation catheter. The stent model and size were chosen based on lesion characteristics and availability. Balloon expandable stents were Neptune (Balton, Poland, n=52). Self expandable stents were complete SE (Medtronic USA, n=16). Post dilatation was performed after implantation of all self-expanding stents. During the procedure, 5000 units of unfractionated heparin was used intra-arterially or intravenously. Clopidogrel 75 mg and aspirin 75mg per day were prescribed to all patients for continuous use.

Follow-Up:

Follow up included clinical examination, measurement of ankle brachial index (ABI) and Duplex study.

Definitions:

Technical success was defined as the absence of <30% residual stenosis on postprocedural angiography at the treated segment. Clinical success was defined by an improvement of walking distance (intermittent claudication).

Complications were defined as minor if no or only minor therapy with overnight observation was required or major when major therapy, prolonged hospitalization, or an unplanned increase in the level of care was necessary.

Primary patency was defined as a patent stent without any reintervention. Primary assisted patency was defined as a patent stent after endovascular reintervention but without occlusion at any time. Secondary patency was defined as a patent stent after occlusion, with patency ending with an untreated or surgically treated occlusion.

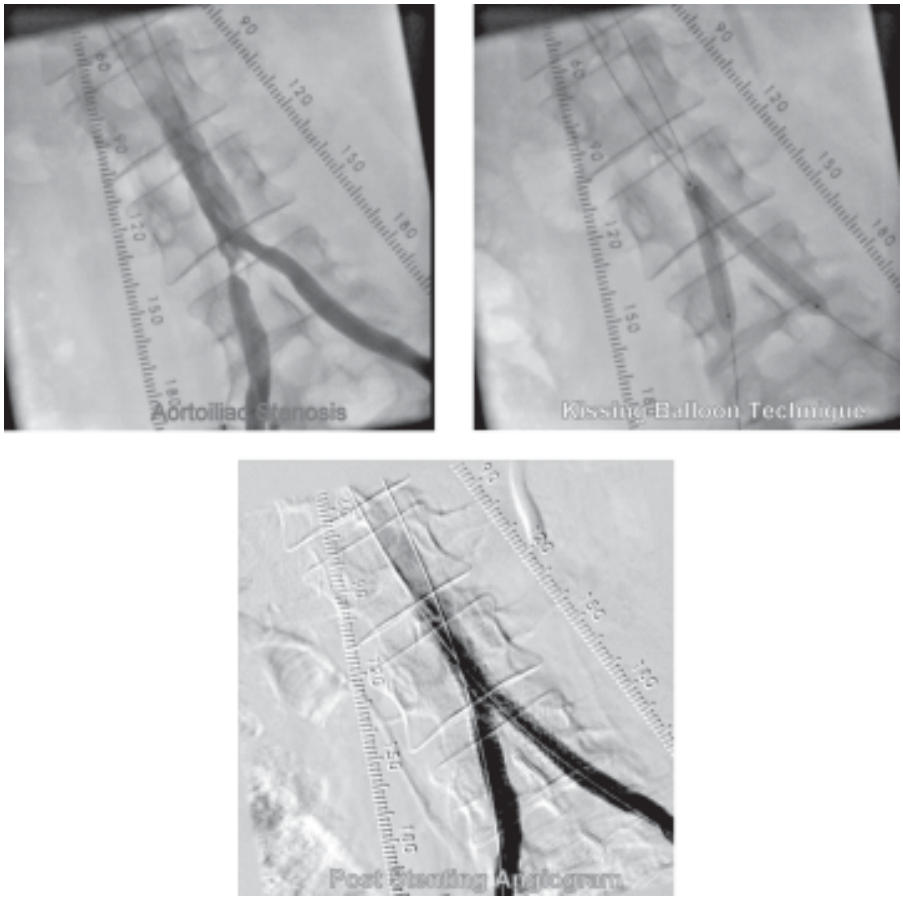

Fig.-1: *Kissing stent technique in aortoiliac stenosis.*

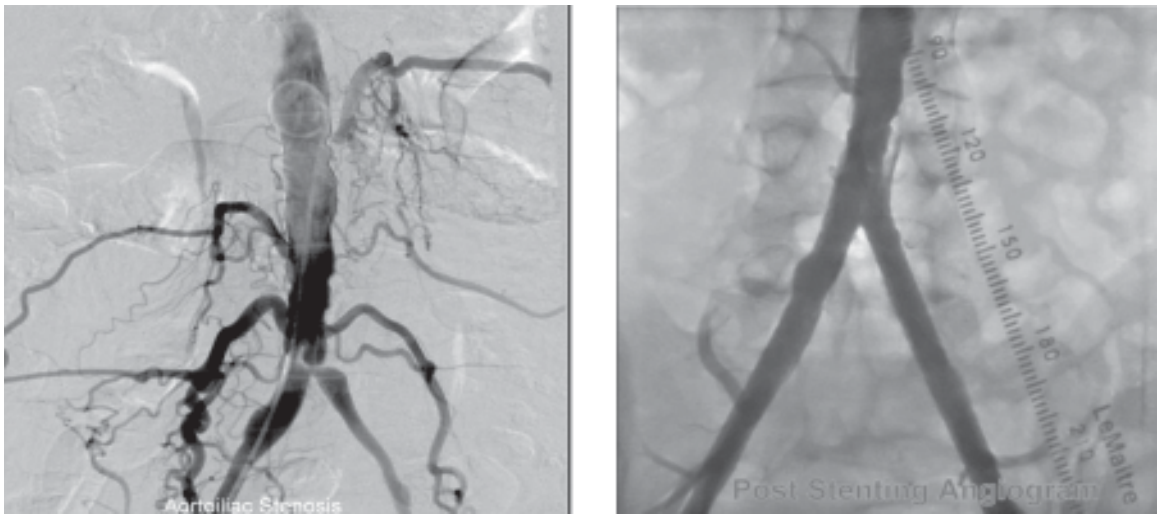

Fig.-2: *Kissing stent technique in aortoiliac stenosis.*

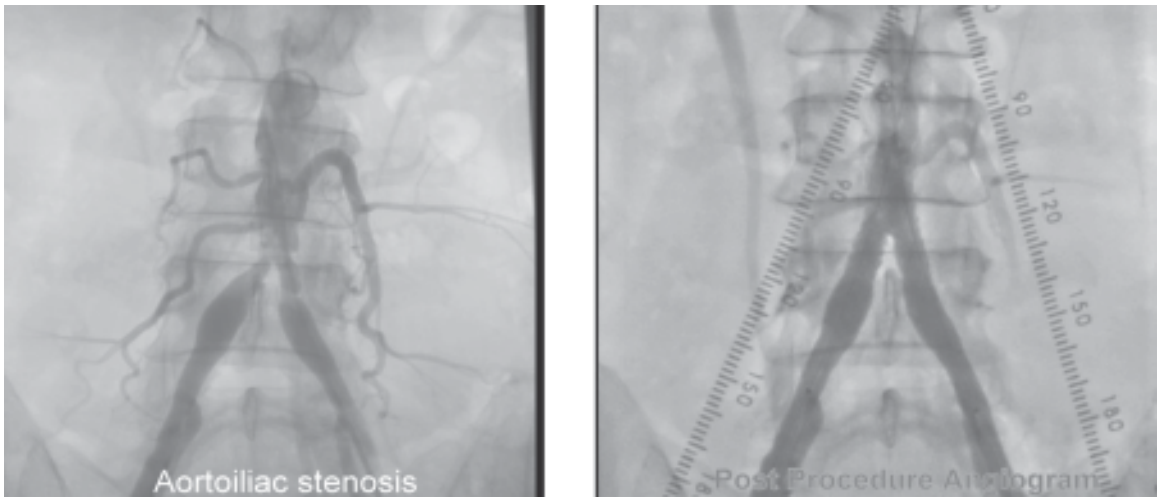

Fig.-3: *Kissing stent technique in aortoiliac stenosis.*

Result:

Patient and lesion characteristics

In this study total 34 patients had aortoiliac kissing stents.

Table-I

Baseline characteristics. (n = 34)

Characters	Number	Percentage
Gender		
Male	29	85
Female	5	15
Risk Factors		
Diabetes mellitus	8	23
Smoking	25	73
Hypertension	12	35
Hyperlipidaemia	6	18

According to Trans-Atlantic Inter-society Consensus (TASC) classification 27 (79%) patients had type A lesions, 4 (12%) type B, 1 (3%) type C and 2 (6%) type D.

Table-II

Lesion characteristic according to TASC guideline. (n = 34)

TASC Type	Number	Percentage
A	27	79
B	4	12
C	1	3
D	2	6

TASC, Trans-Atlantic Inter-Society Consensus

Lesions were described using conventional catheter angiography.

Table-III

Clinical status of limb and stents used.

TASC Type	Number	Percentage
Clinical status (n=34)		
Claudication	25	73
Critical limb ischemia	9	27
Stents used (n=68)		
Balloon expandable	52	76
Self expandable	16	24

Technical and clinical success was achieved in all patients. During intervention, lesions were crossed ipsilaterally in all patients. In most patients (30, 90%), direct stenting was performed but 4 (10%) required predilatation.

Complication:

Following the interventions, major complications occurred in 2 cases (cholesterol embolisation syndrome, groin hematoma). Cholesterol embolisation syndrome was managed conservatively but took prolonged hospitalization. Groin hematoma required surgical correction. One minor complication injury to a branch of external iliac artery required prolongs balloon dilatation of external iliac artery. Five patients died during follow-up period. There was no mortality due to procedure itself or its complication.

Follow-up:

Follow-up period was between 1 month and 72 months. In this series surveillance was not upto satisfactory level. When patients did not attend willingly, they were interrogated over telephone. All the patients except deceased attended for follow-up during initial 12 months. Later on 45% patients attended physically and rests were contacted over telephone. Restenoses were detected in 5 patients and successfully treated with balloon angioplasty.

Discussion:

Percutaneous transtuminal angioplasty for aortoiliac disease has been considered as contraindication because of the risk of occlusion and embolization.[4-7] With the initial utilization of double balloon[4,5] and subsequent introduction of kissing stent[6] technique such lesions can now be safely and effectively treated endovascularly. Primary concern about kissing stents is the lack of contact between the vessel wall and the opposing stents, which may prevent endothelialization and cause thrombosis or hemolysis[6] or induce intimal hyperplasia owing to variations in the wall shear stress[8]. Despite these concerns early results of aortoiliac kissing stents were promising.

In the aortoiliac region, as elsewhere in the body, the type of stent is usually chosen based on lesion characteristics, location, vessel tortuosity, and the profile of the stent. However, other factors, such as ease of deployment, familiarity of the physician, cost, and availability are also taken into consideration.[9] In our patients, stent selection was primarily based on lesion characteristics; for long lesions, occlusions, or those located in tortuous vessels, we preferred self-expanding stents, while we used balloon-expandable stents for short, focal lesions or for eccentric, calcified lesions that are prone to recoil.

Limitations:

This is a retrospective study which is subject to biases regarding patients and lesions. Secondly, although the patients were actively invited to follow up examination, there were gaps in the follow up schedule. The number of patients in our study is small. So the outcome of this study should be regarded with caution.

Conclusion:

Kissing stent implantation is a safe and alternative treatment for aortoiliac disease. It is cosmetic, requires short hospital stay. No incision, regional or general anesthesia is needed.

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