ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 8, Issue, 07, pp.34383-34386, July, 2016

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

AORTIC BIFURCATION STENTING WITH TWO SELF EXPANDING STENTS FOR SEVERELY DISEASED ILIAC ARTERIES

***,[1]Vamsi Krishna Kamana, [2]Padmakumar Ramchandran, [3]Umesh Pai, M., [4]Ravella Keerthika Chowdary and [5]Sridevi Prabhu**

[1]Fellow Interventional Cardiology, KMC, Manipal, Udupi, Karnataka
[2]Professor Cardiology Unit I, KMC, Manipal, Udupi, Karnataka
[3]Assistant professor CVT, SOHAS, Manipal, Udupi
[4]NIMS, Punjagutta, Hyderabad
[5]Assistant professor CVT, SOHAS, Manipal

ARTICLE INFO

Article History:
Received 15th April, 2016
Received in revised form
27th May, 2016
Accepted 15th June, 2016
Published online 16th July, 2016

Key words:

Ankle-Brachial index, Claudication, Peripheral vascular disease, Critical Limb Ischemia, Endovascular intervention.

ABSTRACT

Patency following percutaneous transluminal angioplasty is highest for lesions in the common iliac artery than more distal vasculature of lower limbs. The outcomes following use of self expanding stents in the distal aorta and iliac arteries at the bifurcation was shown to be promising in the past. Here we present a case of bilateral severe iliac artery disease treated by using two self expandable long stents using bifurcation technique. The immediate and one month clinical outcome is very good in this case.

Citation: Vamsi Krishna Kamana, Padmakumar Ramchandran, Umesh Pai, M., Ravella Keerthika Chowdary and Sridevi Prabhu, 2016. "Aortic bifurcation stenting with two self expanding stents for severely diseased iliac arteries", *International Journal of Current Research*, 8, (07), 34383-34386.

INTRODUCTION

A 48 yr old male smoker, hypertensive, non diabetic was admitted to hospital with chief complaints of bilateral lower limb (LL) claudication for the last one year. There is no rest pain or any motor deficits. On examination left LL had feeble pulses and Ankle –Brachial index less than 0.5. No motor deficits. Colour Doppler of both lower limbs was done which suggested decreased arterial velocities with Left more than right leg. He was then taken up for preliminary trans radial peripheral angiogram via high left radial artery (5 – 10 cm's above wrist line) approach. This showed complete occlusion of osteal left common ileac artery (CIA) and 90 % occlusion of proximal right CIA (Figure 1). The femoral arteries are normal bilaterally. At this stage of disease we gave the choice of treating the diseased arteries as the patient is high risk for critical limb ischemia. Initially we gave option for surgical bifurcation bypass and endovascular methods for the management of these bilateral lesions. Finally we proceeded for endovascular intervention. First, Left CIA lesion was tried to open via the retrograde approach after taking a left femoral artery puncture. This landed the guide wire into sub intimal plane (Figure 2). Later Anterograde approach was tried via left radial artery with JR guide support taking up to the aortic bifurcation level. The guide wire was passed finally and the lesion was dilated with 4 mm x 20 mm ADMIRAL Percutaneous Transluminal Angioplasty (PTA) balloon catheter. Later the right CIA was also crossed with a guide wire in retrograde approach from right Femoral artery. Lesion was dilated and later an AMPLANTZER stiff wire is placed across into descending aorta both sides. Now the plan was to stent both iliac arteries from ostia. We choose self expanding peripheral stents (Complete Vascular self expanding OTW MEDTRONIC stent) in view of longer lengths available in the shelf with us and the self expanding peripheral stents had shown good results with our previous experience. They were deployed simultaneously with a segment of overlap into the infra renal descending aorta (Simultaneous Kissing Stent - SKS technique) (Figure 3). Post procedure flow was brisk into both

****Corresponding author: Vamsi Krishna Kamana,***
Fellow Interventional Cardiology, KMC, Manipal, Udupi, Karnataka

iliac arteries (Figure 4). He was kept on anti platelets, statin medications. Before discharge both the limbs showed good pulses. On follow up one month the patient had no symptoms and was doing well.

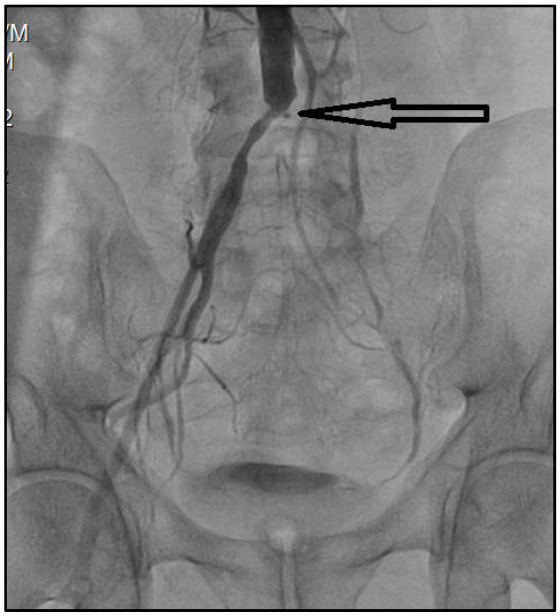

Figure 1. Image showing the totally occluded left iliac artery ostia and 90 % occluded proximal right iliac artery. Aorto-iliac bifurcation

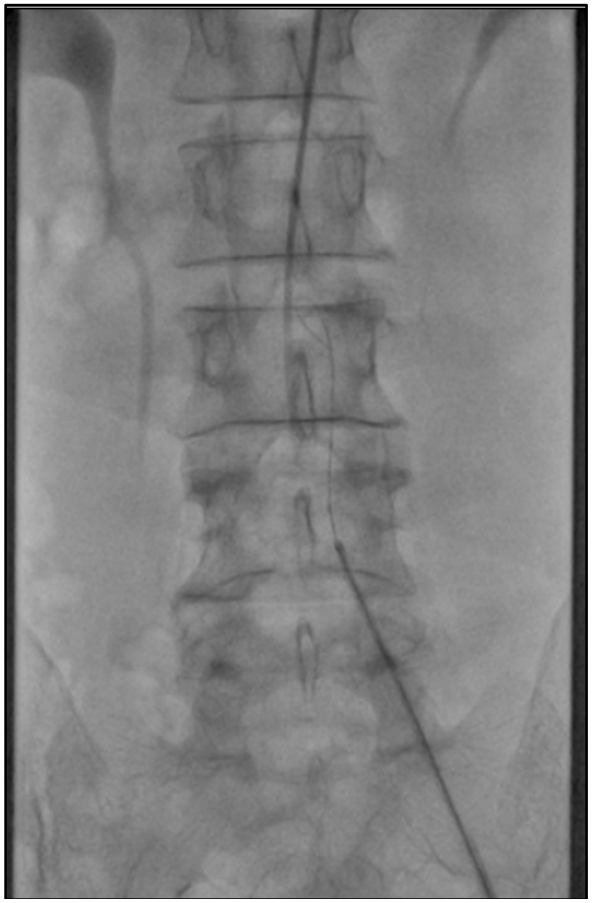

Figure 2. First retrograde approach of crossing the left iliac lesion was tried with Termo wire. Note the wire going into sub-intima

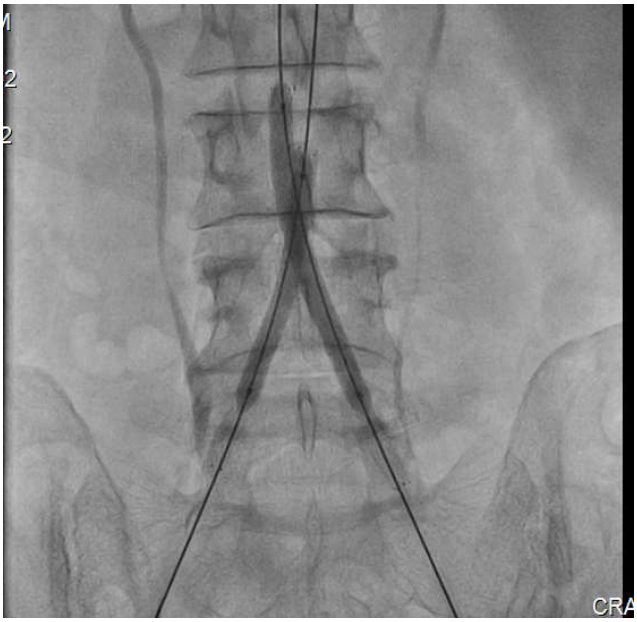

Figure 3. Simultaneous kissing at low pressures (6 atmospheres) of stents after the stents have been deployed

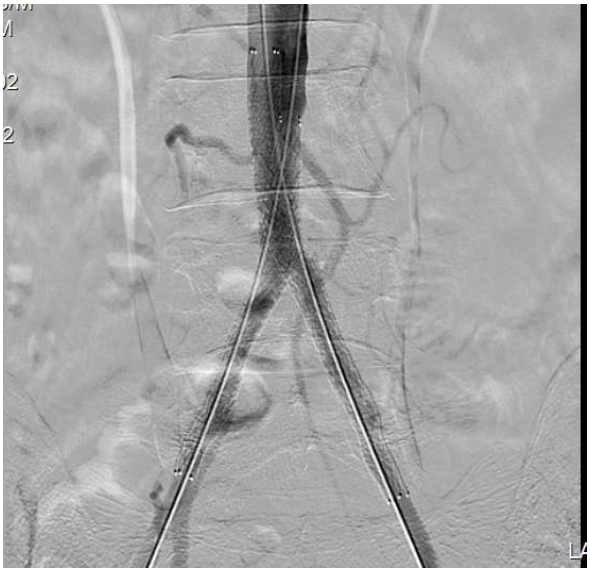

Figure 4. Final flow across the stents. Stents have uniformly expanded

DISCUSSION

Patients with peripheral arterial disease (PAD) have multiple atherosclerosis risk factors and extensive atherosclerotic disease, so are at increased risk for cardiovascular events, similar to patients with established coronary artery disease (CAD). (Criqui *et al*., 1992; Resnick *et al*., 2004; Norgren *et al*., 2007) Patients with PAD, defined as an ABI ≤0.90, are known to be at high risk for cardiovascular events. Mortality rates in patients with PAD average around < 2 % per year and the rates of non-fatal myocardial infarction, stroke and vascular death average 7% per year. (Criqui *et al*., 1992; Resnick *et al*., 2004) For diagnosing PAD, an abnormal Ankle-Brachial Index (ABI) identifies a high-risk population that needs aggressive risk factor modification and anti-platelet medications.

Type A lesions	
	■ Unilateral or bilateral stenoses of CIA ■ Unilateral or bilateral single short (≤3 cm) stenosis of EIA
Type B lesions	
	■ Short (≤3 cm) stenosis of infrarenal aorta ■ Unilateral CIA occlusion ■ Single or multiple stenosis totaling 3–10 cm involving the EIA not extending into the CFA ■ Unilateral EIA occlusion not involving the origins of internal iliac or CFA
Type C lesions	
	■ Bilateral CIA occlusions ■ Bilateral EIA stenoses 3–10 cm long not extending into the CFA ■ Unilateral EIA stenosis extending into the CFA ■ Unilateral EIA occlusion that involves the origins of internal iliac and/or CFA ■ Heavily calcified unilateral EIA occlusion with or without involvement of origins of internal iliac and/or CFA
Type D lesions	
	■ Infra-renal aortoiliac occlusion ■ Diffuse disease involving the aorta and both iliac arteries requiring treatment ■ Diffuse multiple stenoses involving the unilateral CIA, EIA and CFA ■ Unilateral occlusions of both CIA and EIA ■ Bilateral occlusions of EIA ■ Iliac stenoses in patients with AAA requiring treatment and not amenable to endograft placement or other lesions requiring open aortic or iliac surgery

CIA – common iliac artery; EIA – external iliac artery; CFA – common femoral artery; AAA – abdominal aortic aneurysm.

Figure 5. Table showing TASC classification of Aorto-iliac lesions

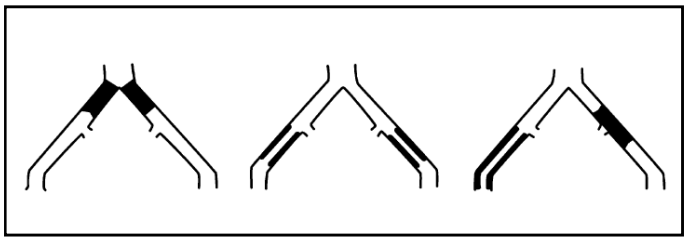

Figure 6. Demonstration of TASC type C lesions. The present case had the lesions at osteoproximal site

So lower the ABI, the higher the risk for cardiovascular events (Resnick *et al*., 2004) Critical limb ischemia (CLI) is a manifestation of peripheral arterial disease (PAD) that describes patients with typical chronic ischemic rest pain (Described in Fontaine and Rutherford classifications, respectively) or patients with ischemic skin lesions, either ulcers or gangrene. The term CLI should only be used if the symptoms persisted for more than 2 weeks. Natural history studies of claudication document that few patients progress to CLI. Many patients who present with CLI are asymptomatic prior to its development. (Dormandy *et al*., 2005) Many observational studies on CLI patients who are not candidates for revascularization suggest that a year after the onset of CLI, only about half the patients will be alive without a major amputation, although some of these may still have rest pain, gangrene or ulcers. Approximately 25% will have died and 25% will have required a major amputation. Their prognosis in many ways is similar to that of some malignancies. Thus the diagnosis of CLI predicts a poor prognosis for life.

Treatment of symptomatic peripheral arterial disease (PAD) is based upon the balance between risk of a specific intervention and the degree and durability of the improvement that can be expected from this intervention. The location and morphology of the disease is also important. So the classification of lesions are important and they are stratified in the following the Trans Atlantic Inter-Society Consensus (TASC) classification scheme. (Figure 5) The peripheral vascular Aorto-iliac occlusive lesion classification came with the release of TASC II in 2007, (Norgren *et al*., 2007) due to the rapid growth of endovascular treatment. For patients with iliac artery occlusive disease as is in our case, revascularization is the primary method for treating intermittent claudication or critical limb ischemia. Endovascular method of treating long segment Aorto-iliac occlusive lesions had also shown success over the last 20 years. (Gandini *et al*., 2008; Yilmaz *et al*., 2004; Carnevale *et al*., 2004; Timaran *et al*., 2003) TASC II recommendations regarding Endovascular Therapy (EVT) state that for typed lesions, "endovascular methods do not yield good enough results to justify them as primary treatment" and for type C lesions (in Figure 6), "open revascularization produces superior long-term results" and "endovascular methods should only be used when there is high risk associated with open repair". Surgical options include autogenous or synthetic bypass, Endarterectomy or an intra operative hybrid procedure. Outcomes of revascularization procedures depend on anatomic as well as clinical factors. Patency following percutaneous trans luminal angioplasty (PTA) is highest for lesions in the common iliac artery and progressively decreases for lesions in more distal vessels. The technical and initial clinical success of PTA of iliac stenoses exceeds 90% in all reports in the literature. This figure approaches 100% for focal iliac lesions. The technical success rate of recanalization of long segment iliac occlusions is 80% to 85% with or without additional fibrinolysis. Other factors, including the Endovascular Training learning curve, should be considered and studied. The Clinical symptoms improved in 83% to 100% in most studies. (Krankenberg *et al*., 2009; Ozkan *et al*., 2009) Recent device developments have substantially improved the technical success rate of Recanalization even in total occlusions. (Saket *et al*., 2004) Becker *et al*. found 5-year patency rate of 72% in an analysis of 2697 cases from the literature, noting a better patency of 79% in claudicants. (Becker *et al*., 1989) Rutherford and Durham found a similar 5-year patency of 70%. (Rutherford and Durham, 1992) A recent study reported a primary patency of 74% (primary assisted patency of 81%) 8 years after stent placement suggesting durability of patency of iliac artery stenting. (Murphy *et al*., 2004) The outcome of different self-expanding stents for the treatment of iliac artery lesions was compared in a multicenter prospective randomized trial which showed that the 1 year primary patencies were not significantly different (both more than 90%), with similar complication and symptomatic improvement rates regardless of the type of stent used. (Ponec *et al*., 2004) So, as we have used two self expanding Nitinol Peripheral stents, we can expect a very good patency in the future also.

The early follow up of this patient is promising till now without any symptoms.

Endovascular treatment for extensive Aorto-Iliac Occlusive Disease can be performed successfully by experienced interventionists in few selected patients like that done in our case. Although primary patency rates are lower than those reported for surgical revascularization, re interventions can often be performed percutaneously, with secondary patency comparable to surgical repair. A meta-analysis by Wei Ye and Chang-Wei Liu *et al* showed an encouraging secondary patency rate of 83.0% at the 5-years. Secondary intervention for EVT restenosis has been widely considered as relatively easy and harmless, with secondary patency rates comparable to that of the secondary patency observed in the open bypass group (95% vs 97%). (Kashyap *et al*., 2008) In a metaanalysis, the operative mortality of EVT for TASC C and TASC D aorto-iliac lesions was 2.9% and the complication rate was 15.3%. Few more meta-analysis of more than 25 articles also had shown a postoperative mortality rate of 4.4% and a complication rate of 12.2% for ABF. (De Vries and Hunink, 1997) So Endovascular therapy remained to be the better choice in treating iliac vessels in the hands of safe and experienced operators.

REFERENCES

Becker GJ, Katzen BT, Dake MD *et al*. 1989. Noncoronary angioplasty. *Radiology*, 170:921e940.

Carnevale FC, Blas MD, Merino SO *et al*. 2004. Percutaneous endovascular treatment of chronic iliac artery occlusion. *Cardiovasc Intervent Radiol*., 27:447-52.

Criqui m, Langer r, Fronek a *et al*. 1992. Mortality over a period of 10 years in patients with peripheral arterial disease. *N Engl J Med*., 326:381e386.

De Vries S, Hunink M. 1997. Results of aortic bifurcation grafts for aortoiliac occlusive disease: a meta-analysis. *J Vasc Surg*., 26:558-69.

Dormandy ja, charbonnel b, eckland dj *et al*. 2005. Secondary prevention of macrovascular events in patients with type 2 diabetes in the PROactive Study (PROspective pioglitAzone Clinical Trial In macroVascular Events): a randomised controlled trial. *Lancet*, 366(9493):1279e1289.

Gandini R, Fabiano S, Chiocchi M *et al*. 2008. Percutaneous treatment in iliac artery occlusion: long-term results. *Cardiovasc Intervent Radiol*., 31:1069-76.

Kashyap VS, Pavkov ML, Bena JF *et al*. 2008. The management of severe aortoiliac occlusive disease: Endovascular therapy rivals open reconstruction. *J Vasc Surg*., 48: 1451-7.

Krankenberg H, Schlüter M, Schwencke C *et al*. 2009. Endovascular reconstruction of the aortic bifurcation in patients with Leriche syndrome. *Clin Res Cardiol*., 98:657-64.

Murphy TP, Ariaratnam NS, Carney Jr WI *et al*. 2004. Aortoiliac insufficiency: long-term experience with stent placement for treatment. *Radiology*, 231(1):243e249.

Norgren L, Hiatt WR, Dormandy JA *et al*. 2007. Inter-Society consensus for the management of peripheral arterial disease (TASC II). *J Vasc Surg*., 45;Suppl S:S5-67.

Ozkan U, Oguzkurt L, Tercan F *et al*. 2009. Endovascular treatment strategies in aortoiliac occlusion. *Cardiovasc Intervent Radiol*., 32: 417-21.

Ponec D, Jaff MR, Swischuk J *et al*. 2004. The Nitinol SMART stent vs Wallstent for suboptimal iliac artery angioplasty: CRISP-US Trial results. *J Vasc Interv Radiol*., 15(9):911e918.

Resnick he, Lindsay RS, Mcdermott mm *et al*. 2004. Relationship of high and low ankle brachial index to all-cause and cardiovascular disease mortality: The Strong Heart Study. *Circulation*, 109(6):733e739.

Rutherford R, Durham J. 1992. Percutaneous ballon angioplasty for arteriosclerosis obliterans: long term results. In: YAO J, PEARCE W, eds. Techniques in Vascular Surgery. Philadelphia, Saunders, 329e345.

Saket RR, Razavi MK, Padidar A. *et al*. 2004. Novel intravascular ultrasound-guided method to create transintimal arterial communications: initial experience in peripheral occlusive disease and aortic dissection. *J Endovasc Ther*., 11(3):274e280.

Timaran CH, Prault TL, Stevens SL *et al*. 2003. Iliac artery stenting versus surgical reconstruction for TASC (TransAtlantic Inter-Society Consensus) type B and type C iliac lesions. *J Vasc Surg*., 38:272-8.

Yilmaz S, Sindel T, Lüleci E *et al*. 2004. Subintimal versus intraluminal Recanalization of chronic iliac occlusions. *J Endovasc Ther*., 11:107-18.

****