

# One-Stage Angioplasty and Stenting of Ostium of Left Common Carotid Artery and Stenting of Left Internal Carotid Artery

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Received: 08 Nov. 2015; Revised: 12 Feb. 2016; Accepted: 04 Apr. 2016

**Abstract-** Our aim was to report techniques and our experience in One-stage angioplasty and stenting of ostium of left common carotid and left internal carotid arteries in an octogenarian man with transient ischemic attack, who was completely recovered from neurologic insults short time after the procedure. An 81-year-old man presented with a transient ischemic attack. Neurologic examination showed left side transient visual obscuration or amaurosis fugax and right hemiparesis. Carotid duplex imaging revealed an 80% stenosis of the left internal carotid artery (LICA) and 95 % of the ostium of left common carotid artery (left CCA). Immediate brain MRI wasn't possible. Angioplasty and stenting of both lesions (left CCA and LICA ) was performed successfully without complications in one session. Stenting of common carotid artery ostial lesion and internal carotid artery (due to significant lesion) in one session could be done even in acute neurologic phase and also in very old patients, provided that, considering technical ways for neuroprotection and avoidance of other complications.

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*Acta Med Iran* 2017;55(1):79-81.

**Keywords:** Angioplasty; Stenting; Transient ischemic attack

## Introduction

Carotid artery stenting (CAS) has obtained clinical significance, in spite of endorsing of carotid endarterectomy (CEA), in large clinical trials, like U.S. randomized clinical trials and multiple pivotal registry trials (1).

The SAPPHERE trial (Stenting and Angioplasty with Protection in Patients at High Risk for Endarterectomy) compared CAS and CEA. There wasn't any difference in 1-year stroke, death, and MI incidence, but asymptomatic patients had significantly better outcome for CAS (2).

In confirming of above mentioned trials, researchers of CREST trial (Carotid Revascularization Endarterectomy Versus Stenting Trial) identified no difference between CEA and CAS for the combined endpoint of myocardial infarction (MI), stroke, death at the end of 4 years follow-up.

Percutaneous stenting of ostial lesions of the common carotid artery appears safe and effective (4) and in current

era Transfemoral, PTA/stenting appears to be an appropriate treatment option for ostial/proximal common carotid artery significant stenoses (5). Performing of this procedure in elderly might be much more demanding than other age groups due to the difficulty in passing devices, the risk of new neurologic events during the procedure because of multiple calcified plaques in the aorta, carotids and other important cerebral branches and a higher risk of contrast-induced nephropathy (CIN).

Therefore, ideally, it is better to do this procedure in one session by limiting the time of unnecessary manipulations and limiting the volume of contrast materials and strive for immediate reversal of neurologic deficits by acceptable revascularization to avoid persistence of neurologic deficits.

Our aim was to report techniques and our experience in one – stage angioplasty and stenting of the ostium of the left common carotid artery and stenting of a left internal carotid artery in an octogenarian man with transient ischemic attack, who was completely recovered from neurologic insults short time after the procedure.

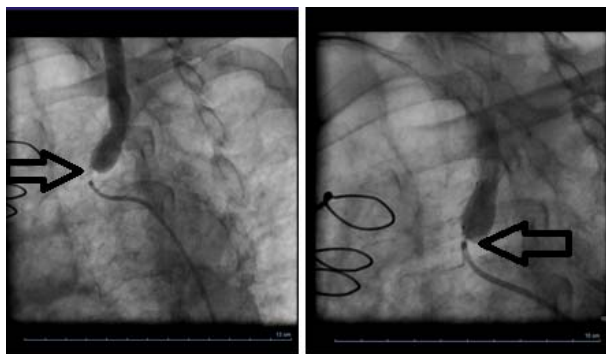
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## Case Report

An 81-year-old man presented with a transient ischemic attack. Neurologic examination showed left side transient visual obscuration or amaurosis fugax and right hemiparesis. Immediate brain MRI wasn't possible. Carotid duplex imaging revealed an 80% stenosis of the left internal carotid artery (LICA) and 95 % of the ostium of left common carotid artery (left CCA). He had a history of systemic hypertension, hyperlipidemia, and coronary artery bypass surgery 3 years ago. One month before, his coronary angiography showed patent bypass grafts. In echocardiography, left ventricular ejection fraction was about 55 %.

There weren't significant valvular or any echocardiographic problems. After initial stabilization, his vital signs were stable. Baseline laboratory data including: complete blood count, hemoglobin, blood urea nitrogen, serum creatinine, sodium and potassium levels were in normal ranges. After consultation with neurology team, he underwent carotid angiography and the obtained data was the same as mentioned before (Figure 1A, 1B and Figure 2A) (80% stenosis of the LICA and 95 % of the ostium of left CCA). Vertebral and subclavian arteries were patent.



**Figure 1.** Represent the A) significant stenosis of the ostium of left common carotid artery and B) wire passage

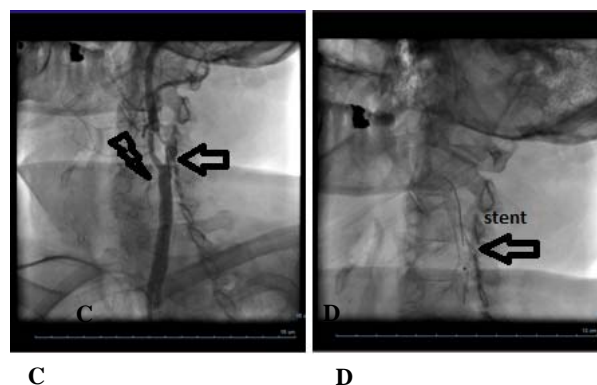
We tried for angioplasty and stenting of the both lesions. Access for carotid artery obtained through right femoral approach. An aortogram was obtained in the left anterior oblique position at 45° of angulation using pigtail catheter. There was type A aortic arch. Selective catheterization of innominate artery, left and right common carotid arteries, left and right vertebral arteries and intracerebral branches was done in

anteroposterior, lateral, and intracerebral views using a judkins right 6\*4 diagnostic catheter. The guide wire was placed in the left CCA, and the diagnostic catheter was replaced with a A 8F/ Multipurpose A1 (MP A1) guide catheter, that was advanced over the guide wire into the left internal carotid artery under direct fluoroscopy. Intra venous Heparin 80 IU/kg was administered to attain an activated clotting time >250 seconds. Predilatation was performed with a quantum 2.5 \* 15 and Ever Cross 4.0 \*30 balloons. Stent Express LD 8.0\* 27 was deployed at 7 atm. For significant lesion of LICA, MP A1 guiding catheter was replaced with a guiding catheter 8F/judkins right 4 (JR 4). Distal protection was provided by Filter Wire EZ 3.5 \* 5.5.

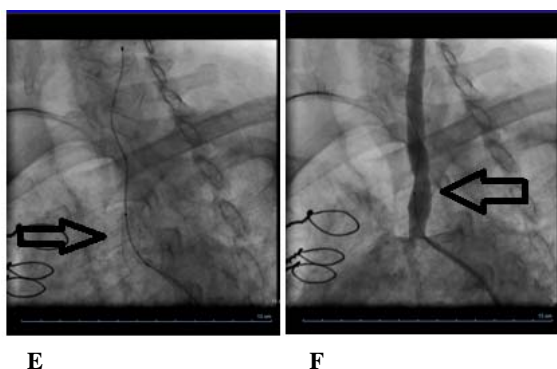
Predilatation was done by balloon Falcon Grande 5.0\* 20. Then Stent Cristallo 7.0 \* 10 \* 40 was passed across the lesion and deployed at 6 atm (Figure 2B and Figure 3A).

A repeat arteriogram was performed. There was no residual stenosis (exceeding 30%) in left CCA and LICA (Figure 4). Sheaths and wires were removed, and an access site closure device was deployed. The course of the patient was uneventful.

All mentioned neurological problems was recovered after 6 hours. He was discharged after 3 days. Renal function, hemoglobin, white blood count, also sodium and potassium levels were in normal ranges. Neurological exam was unremarkable in this period and there wasn't any space occupying lesion or other abnormality in follow up brain MRI. In follow up of three month later, patient was examined again by both cardiologist and neurologist. Fortunately, there weren't significant findings.



**Figure 2.** Represents the C) significant stenosis of LICA and D) stent in left CCA



**Figure 3.** Represents E) the stent in left CCA and wire for angioplasty of LICA and F) successful result for angioplasty of LICA



**Figure 4.** Represents the successful angioplasty of LCC and LICA

## Discussion

We described successful angioplasty and stenting of left common carotid artery and stenting of a left internal carotid artery in an 81-year-old man with a transient ischemic attack of the left hemisphere and transient visual obscuration (amaurosis fugax). As mentioned above, some experts proposed that Percutaneous stenting of ostial lesions of the common carotid artery appears safe and effective (4). But in spite of this expert opinion, It has been shown that most of the interventionists do not prefer to do angioplasty and stenting of carotid ostial lesions, due to lack of enough experience, high procedural risk, time wasting and long lasting procedure and type of patients presenting with this problem (advanced age and fragility). In one study, Cam *et al.* reviewed from January 2005 until April 2011, 17 patients who underwent percutaneous stenting of ostial lesions of the common carotid artery. During the 17.6 month follow-up, only one patient had a transient

ischemic attack, and none of them had either stroke, ischemic retinal event, myocardial infarction or contrast nephropathy. Death was observed in five patients at the end of the study period. Death was observed in five patients at the end of the study period (4).

Safety of percutaneous transluminal angioplasty (PTA) and/or stenting of ostial/proximal common carotid artery lesions (pCCA) was assessed by Paukovits TM and his group. They also compared 30-day stroke and mortality rate of PTA with surgery. They showed PTA/stenting appears to be appropriate treatment option for ostial/proximal common carotid artery significant stenosis (5). In an article by James Joye (6), he published results of his experience about "Neuroprotection for Ostial Common Carotid Stenoses" and showed: The "double-wide" technique is an effective method of treating these complex lesions. In this case report, we described techniques and our experience in one-stage angioplasty and stenting of ostium of left common carotid artery and stenting of left internal carotid artery in an octogenarian man who became symptom-free and was discharged uneventfully.

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