



Cerebral Nitinol Stenting in Progressive Stroke and in Crescendo TIA's

Or Cohen-Inbar MD PhD; Yaaqov Amsalem Md

[Institution]

Department of Neurosurgery, Rambam Health Care Campus, Haifa, Israel

Department of Interventional Neuroradiology, Rambam Health Care Campus, Haifa, Israel

Technion Israel Institute of Technology



Introduction

Acute ischemic stroke (AIS) is the third leading cause of death. Arterial stenosis is a common cause of stroke, with a high risk of recurrent stroke. Treatment guidelines for AIS and transient ischemic attack (TIA) are still under debate. Treatment guidelines for progressive stroke or crescendo TIA's do not exist. Percutaneous transluminal angioplasty and stenting (PTAS) is an increasingly attractive treatment option, whose efficacy is to be proven. Stent placement however possess both short and long term risks such as immediate ischemic events, in-stent stenosis and stent breakage. Thus, the choice of stent type is critical. We report our experience with the LEO + (Balt Extrusion, Montmorency, France) nitinol flexible self-expanding stent for the treatment of progressive CVA or crescendo TIA's.

Methods

12 patients, presenting with a clinical picture of a crescendo TIA or progressive stroke in evolution, not halted by optimal medical care were treated. Patients had a corresponding major cerebral arterial narrowing and evidence of cerebral infarction on imaging. Patients were followed.

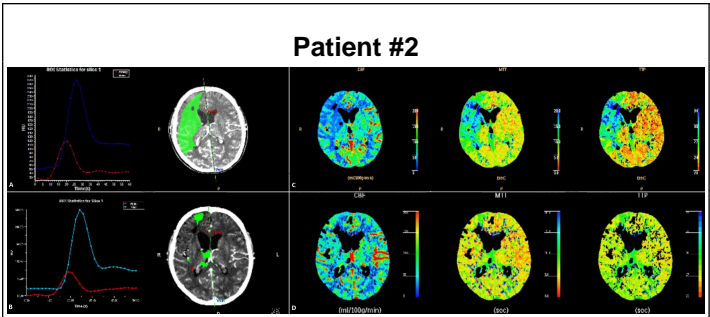


Table 1

Table 1 – Patient Presentation and Treatment Features							
Patient no.	Age (years)	Sex	Clinical presentation	Radiological presentation	Location and vascular pathology	No. of stents	Conservative treatment
1	17	M	Crescendo TIA of Right hemiparesis, dysphasia	Left basal ganglia CVA	Left ICA concentric stenosis and dissection at the cavernotic and supraclinoid section, ICA and left MCA partial thrombotic occlusion (C5-C6)	2 (12*2.5, 25*3.5)	clopidogrel, aspirin, Integrilin
2	52	M	Left hand monoparesis, left central facial nerve palsy	Right internal capsule lacunar CVA	Right supraclinoid ICA+MCA thrombotic occlusion (C5-C6)	2 (18*2.5, 18*3.5)	clopidogrel, aspirin, Integrilin
3	57	M	TIA of Left hemiplegia	Sub-acute multiple right MCA infarcts	Right MCA stenosis	1 (18*2.5)	Heparin, agronex, aspirin, Integrilin
4	57	F	Crescendo TIA of Dizziness, dysphagia and multiple cranial nerve palsies	Multiple brainstem, cerebellar and occipital CVA	Mid-basilar artery stenosis	1 (18*3.5)	Heparin, clopidogrel, aspirin
5	34	M	Aphasia, Right hemiparesis, Facial nerve palsy	Left basal ganglia CVA	ICA occlusion at the ophthalmic (C6) segment	1 (18*2.5)	Heparin, TPA, Integrilin
6	52	F	Crescendo TIA of Left hemiparesis	Focal hemispherical infarcts	M1 stenosis of 65%.	1 (18*2.5)	LMWH, aspirin, clopidogrel, Integrilin
7	75	F	Convulsions, aphasia and right hemiplegia	Left MCA ischemic CVA	Complete occlusion of left ICA (from C4) and left MCA	1 (25*3.5)	Heparin
8	53	M	Ataxia, dysphasia and multiple cranial nerve palsies	Occipital and Cerebellar lacunar infarcts,	Vertebral (V4) and Basilar artery stenosis and acute thrombosis, right hypoplastic vertebral artery	2 (18*3.5, 35*3.5)	Heparin, clopidogrel, aspirin,
9	61	M	Dysarthria, right hemiplegia	Multiple brainstem, cerebellar and cerebral infarcts	Distal right vertebral artery occlusion at V4, Basilar artery stenosis	1 (25*3.5)	Heparin, clopidogrel, aspirin,
10	40	M	Left hemiparesis, left facial nerve palsy, dizziness	Brainstem lacunar infarct	Initial and mid 1/3 Basilar artery dissection over AICA origin with partial thrombotic occlusion. Additional finding of ascending aortic aneurysm.	1 (25*3.5) 1 (75*4.5)	Heparin, clopidogrel, Integrilin
11	63	M	Dysphasia, Right hemiparesis and paraesthesia	Small lacunar CVA	Left ICA C4 (cavernous part) severe stenosis with hemispherical hypoperfusion	1 (18*2.5)	Heparin, presogrel, aspirin, Integrilin
12	73	M	TIA of left hemiparesis	None	Proximal basilar artery stenosis, M2 stenosis	1	Aspirin, clopidogrel

Results

Twelve patients aged 17~80 years were treated during the study period (20 months). Sixteen Nitinol flexible self-expandable stent (LEO +, Balt Extrusion, Montmorency, France) were placed. All patients showed moderate to substantial improvement in neurological functions.

Table 2

Table 2 – Treatment Outcome Data						
Patient no.	Mean Follow up (months)		Modified Rankin score at last follow-up	Complications		Procedure and patient outcome
	Clinical	Radiological		Short term	Long term	
1	20 (07/2011)	19 (06/2011)	0	None	None	Patent, no restenosis. Asymptomatic patient
2	17 (11/2011)	20 (08/2011)	0	Moderate intimal hyperplasia at mid-stent after 12 months	None	Stenosis treated with balloon dilatation. Asymptomatic patient
3	19 (10/2011)	3 (06/2010)	1 (chronic polio related disability)	Asymptomatic Stent occlusion, clopidogrel resistant	None	Stent occlusion asymptomatic due to collaterals. Asymptomatic patient
4	19 (09/2011)	15 (07/2011)	1	Cerebellar and Brainstem focal multiple small infarcts	None	Patent stent. Mild Hemiparesis.
5	12 (12/2011)	12 (12/2011)	0	None	None	Initial TPA treatment and MC resulted in restenosis, after which stented. Asymptomatic patient
6	8 (11/2011)	8 (11/2010)	0	None	None	Minimal asymptomatic intimal hyperplasia. Asymptomatic patient
7	5 (10/2011)	5 (10/2011)	3	None	None	Patent, no restenosis. Right hemiparesis improved upon rehabilitation
8	5 (12/2011)	4 (11/2011)	0	None	None	Patent, no restenosis. Ataxia and dysarthria improving.
9	6 (02/2012)	4 (01/2012)	0	None	None	Dysarthria and right hemiparesis improved.
10	13 (11/2011)	13 (11/2011)	1	None	None	1 st stent due to basilar dissection. 2 nd stent to correct basilar and V4. (Replaced aortic arch + AVR after 2 months). Minor residual hemiparesis.
11	5 (11/2010)	5 (11/2010)	1	None	None	Patent stent, deceased within 12 months 2 nd to invasive prostatic carcinoma.
12	8 (02/2012)	8 (02/2012)	0	None	None	Left hemiparesis improved.

* N/A – not available

** MC – mechanical thrombectomy

Conclusions

PTAS should be considered as a treatment option in case of progressive stroke or crescendo TIA's coupled with appropriate anatomical findings. This may allow for a substantial improvement in functional and neurological status.