



## "ENDOVASCULAR MANAGEMENT OF CAROTID ARTERY DISEASE "

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**ABSTRACT**

Stroke is the third leading cause of mortality and accounts for over 143,579 deaths every year. Approximately 795,000 people experience a new or recurrent stroke every year. <sup>(2)</sup>

At least 15–20% of all ischemic strokes are attributed to carotid artery atherosclerosis. <sup>(3)</sup> Hence the present study was done at our tertiary care centre to assess the utility of carotid artery stenting as a mode of management of carotid artery stenosis.

**KEYWORDS** : Angioplasty, Carotid Artery stenosis, Stent placement.

**Introduction:-**

Carotid endarterectomy (CEA), practiced since the 1950s, is an effective and durable method for treating severe carotid bifurcation atherosclerotic disease. Over the past decade, carotid artery stenting (CAS) has emerged as an alternative technique to treat extracranial carotid stenosis and has raised the possibility of a dramatic paradigm shift in therapy. As data have begun to emerge suggesting that CAS may be the preferred therapy for certain patients at high risk for complications after CEA, controversy has shifted from a question of whether carotid stenting is a clinically useful procedure to one of when it is preferable to CEA. Much of the ongoing debate regarding these two treatment modalities centers on precisely which clinical factors predict increased surgical risk and to what degree. However, these assumptions have recently been challenged by the interesting results of the clinical trial Stenting versus Endarterectomy for Treatment of Carotid Artery Stenosis (CREST), demonstrating no significant differences between surgery and stenting in a selected groups of patients.

Hence the present study was done at our tertiary care centre to assess the utility of carotid artery stenting as a mode of management of carotid artery stenosis.

**Materials and Methods**

**PLACE OF STUDY:** Grant Medical College, Mumbai

**STUDY DURATION:** 2 years

**TYPE OF STUDY:** A hospital based prospective study

**SAMPLE SIZE:** 40 Patients

**SAMPLING METHOD:** RANDOM

**INCLUSION CRITERIA:**

All outdoor and IPD patients referred to the department of Radio Diagnosis of a tertiary care centre with symptoms of carotid artery stenosis

**EXCLUSION CRITERIA:**

1. Patients not consenting to the study
2. Hemodynamically unstable patients
3. Chronic Kidney Disease or Kidney failure
4. Previous heart attacks

**Technique:-**

All the patients underwent the following:-

1. Full medical and neurological history including history of associated comorbidities and risk factors.
2. Neurological examination at four points before stenting, immediately after stenting one month after stenting and 6th month after stenting with assessment of any neurological disorder (Headache, delirium, altered mental state, TIA or stroke)

3. Assessment of the degree of carotid stenosis by using carotid artery duplex ultrasound before the procedure, MRA and/or CTA on the arch and supraaortic vessels may be used in some cases to confirm the stenosis and anatomy of the carotid vessels origins.
- 4- Electrocardiography (ECG) before, during and after the procedure.
- 5- Laboratory investigations: complete blood count, PT, PTT, liver and renal function tests, random blood sugar, lipid profile, serum uric acid, CRP and cardiac enzymes if needed.
- 6- The degree of stenosis was determined according to North American Symptomatic Carotid Endarterectomy Trial (NASCET) criteria. All patients received 325 mg aspirin and 75 mg clopidogrel daily, at least three days before the procedure. Alternatively, a loading dose of Aspirin 325 mg orally and clopidogrel 300 mg orally can be given the day before or atleast 5th before the procedure.

Diagnostic angiography consists of visualization both carotid bifurcations in several projections, both vertebral arteries and intracranial study of both carotid arteries.

6. Lateral Projection; "Road map" is taken to show the origin of the external carotid artery (ECA), the guide wire is then removed for placement of an 0.035 Amplatz wir.

After anaesthetising the patient a surgical cut was made in the groin, following which a catheter was placed through a cut into an artery. The catheter was carefully moved upto the blockage in the carotid artery.

Next a wire was moved through the catheter to the blockage. Another catheter with a very small balloon on the end was then pushed over this wire and into the blockage. Then the balloon was inflated.

The balloon was pressed against the insides of the artery which allowed more blood to flow to the brain. Then a stent was placed in the blocked area. The stent was inserted at the same time as the balloon catheter. The stent was left in place to help keep the artery open but the balloon was removed.

**Post-procedure:**

1. The patients were transferred to the stroke unit for observation for two days.
2. Aspirin 150 mg once daily for life.
3. Colpidogrel 75 mg once daily for 6 month.
4. Duplex control after 1 month, then after 6 months to identify in-stent restenosis of the stent ( $\geq 50\%$  in stent restenosis).
5. Recording of any procedural complications (puncture related,

- bradycardia, hypotension, hyperperfusion, stroke, TIA and MI).
6. Imaging of the brain CT or MRI in case of vascular complications (TIA or Stroke) occur.

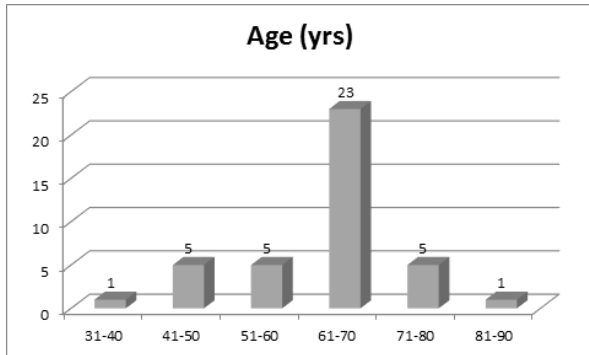
**Procedural success was defined as:**

1. To cover the whole lesion by the use of a single stent.
2. To achieve a < 30 % residual diameter stenosis of the treated lesion in at least two matched views on angiography

**Results:-**

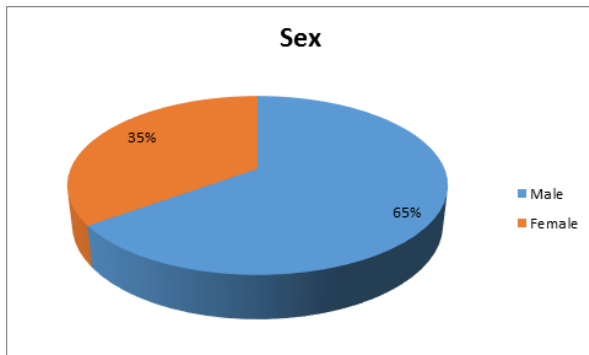
**Distribution of patients according to Age**

Majority of the patients (57.5%) were in the age group of 61-70 years followed by 12.5% in the age groups of 41-50 years, 51-60 years, 71-80 years and 2.5% in the age groups of 31-40 years and 81-90 years. The mean age of the patients was 62.73±9.97 years.

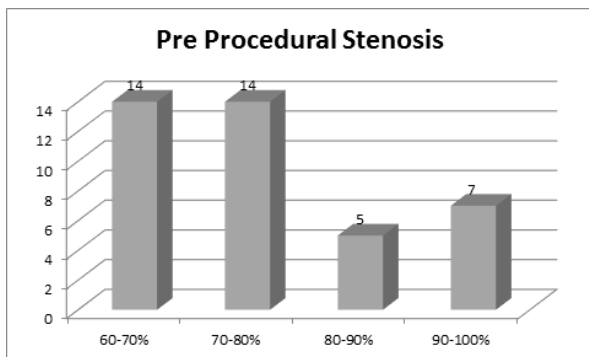


**Distribution of patients according to Sex**

There was male preponderance (65%) in the group while female patients constituted 35% of the study group.



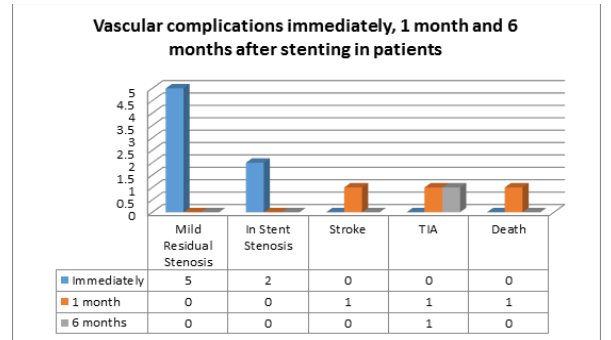
**Distribution of patients according to Pre Procedural Stenosis**



**Vascular complications immediately, 1 month and 6 months after stenting in patients**

The immediate vascular complications after stenting were Mild Residual Stenosis (12.5%) and In Stent Stenosis (5%). 1 month after stenting 1 (2.5%) patient each had stroke and Transient Ischemic Attack (TIA) while 1 patient died. It was observed that 6 months after stenting, 1 (2.5%) patient had TIA. There was no significant

difference in complications immediately, 1 month and 6 months after stenting as per Chi-Square test ( $p > 0.05$ ).



**CONCLUSION**

Patients undergoing CS demonstrates acceptable 30-day periprocedural complications and a low incidence of late stroke. These results underscore the need to validate this less invasive procedure against CEA, the current "gold standard," surgically proven treatment for carotid artery disease. The immediate and late results from the present study support the "clinical equipoise" necessary to begin randomization.

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