



**TO EVALUATE THE EFFICACY OF ENDOVASCULAR TREATMENT IN COMPLICATIONS OF HAEMODIALYSIS DIALYSIS ARTERIOVENOUS FISTULA (AVF).**

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**ABSTRACT**

Central vein stenosis is common because of the placement of venous access and compromises vascular access for dialysis. Endovascular intervention with angioplasty and/or stent placement is the preferred approach. Stent placement is recommended for quick recurrence or elastic recoil of stenosis. Recanalization of occluded central veins is tedious and not always successful. Placement of hybrid graft-catheter with a combined endovascular surgical approach can maintain patency in many cases.

**KEYWORDS** : Angioplasty, Central vein stenosis, Stent placement, Vascular access for hemodialysis

**Introduction:-**

A common problem in the management of patients undergoing hemodialysis is central vein stenosis (CVS) or occlusion. An important goal of all physicians who care for patients with severe renal dysfunction should be to preserve and protect the central veins, a task that is not easily accomplished. The development of this problem in the dialysis patient is a serious issue, and it has a greater impact compared with stenosis of a peripheral vein because the central veins represent the final common pathway for blood flow from the periphery to the heart. If central stenosis is allowed to progress, the arteriovenous hemodialysis vascular access may eventually be lost. In addition, the development of central vein obstruction obviates the possibility of creating a new vascular access on the affected side. An unfortunate consequence of the loss of central vein patency for the patient is diminished life expectancy. Studies regarding endovascular management of central vein stenosis or occlusion are lacking in a hospital setting in India, wherein the efficacy may vary in comparison to studies in developed nations. Hence, this study was planned with an aim to evaluate the outcome of management of central vein stenosis or obstruction in arteriovenous fistula of patients with hemodialysis

**Materials and Methods**

50 Patients of hemodialysis referred to the Department of Interventional Radiology with symptoms of complications of AVF for angiographic analysis and management.

**Inclusion Criteria:**

Patients of chronic renal failure with hemodialysis access consisting of arterio-venous fistulas.

Patients giving informed consent.

**Exclusion Criteria:**

Hemodynamically unstable patients.

Patients with arterio-venous grafts or central venous catheters.

Presence of blood coagulation disorder or sepsis.

**Statistical analysis:**

The data was analyzed using SPSS version 21 software. Descriptive statistics were expressed in Mean+SD and percentages. The level of significance in the study was 0.05 (p<0.05).

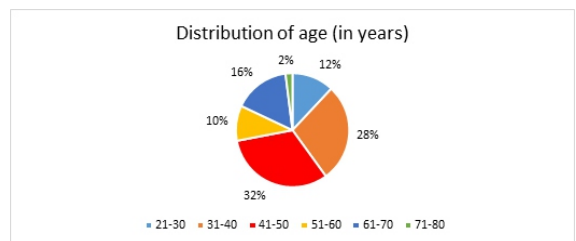
**Technique:-**

Combined approach using both cephalic and common femoral veins was used. Access site was secured using short 7-11 F sheath (compatible with balloon and stent placement). The stenotic site

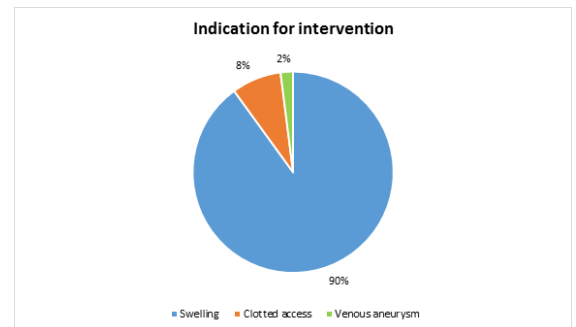
was traversed using a 0.035-inch hydrophilic guide wire. Difficult lesions: Microcatheter and microguidewire assembly. After traversing the lesion, hydrophilic guidewire was replaced by exchange length stiff guide wire. Serial balloon dilatation using 4 – 14 mm non-compliant balloons. PTA was followed by stent placement in the same setting in selected cases.

**Results:-**

In the study, majority of patients in the study were between 41-50 years (32%), followed by 31-40 years (28%), 61-70 years (16%), 21-30 years (12%), 51-60 years (10%) and 1 (2%) patient was between 71-80 years. The mean age of patients in the study was 45.46±13.22 years (22-76).



Most common indication for intervention was swelling of the upper extremity (90%). Few patients presented with clotted access (8%). One patient had the complication of venous aneurysm.



Brachiocephalic vein was most commonly involved vein (84%). Single vein involvement was noted in 70% patients, with 64% with brachiocephalic alone and 6% with cephalic vein. Involvement of 2 veins was noted in 20% patients. Brachiocephalic and superior vena cava involvement was noted in 10% patients, brachiocephalic vein with subclavian vein was involved in 6%, 2% each of brachiocephalic vein with cephalic vein and subclavian vein with cephalic vein. One

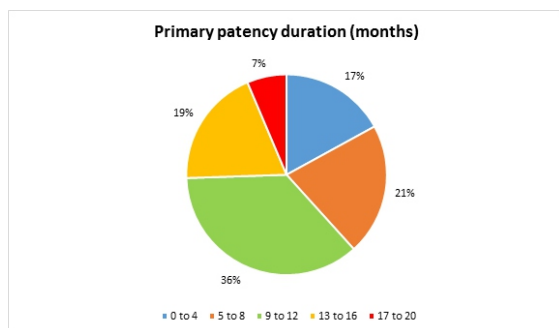
patient had lesions in 3 veins – brachiocephalic vein, subclavian vein and cephalic vein.

The initial technical success rate was 94% of all procedures. The initial technical success rate of stenting was 100%. In those undergoing angioplasty, the initial technical success rate was 83.3%. Angioplasty failed in 2 patients, of which 1 had lesion in a fistula and another had lesion in brachiocephalic vein.

Stents were deployed in 74% patients as a primary procedure, while in 26% balloon angioplasty was performed.

In patients undergoing stenting (n=37), primary patency rate at 3 months was 100% (n=37 out of 37), at 6 months was 97.14% (n=34 out of 35) and at 12 months was 71.43% (n=15 out of 21).

In patients undergoing balloonplasty (n=12), primary patency rate at 3 months was 88.89% (n=8 out of 9), at 6 months was 83.33% (n=5 out of 6) and at 12 months was 50% (n=2 out of 4).



The mean primary patency duration of all procedures in the study was 9.84±4.45 months (0.4-18). The mean primary patency duration of those with stenting was 10.62±4.28 months (3-18). The mean primary patency duration of those with balloon plasty was 6.94±4.02 months (0.4-12).

A total of 9 patients had to undergo secondary procedure owing to the failure of primary intervention on follow up. Technical success rate of secondary procedure was 88.89% (n=8), while the secondary procedure was unsuccessful in 1 patient with cephalic thrombosis. Among the secondary procedures, balloon plasty of brachiocephalic vein was performed in 2 patients, that of brachiocephalic vein and subclavian vein was performed in 1 patient and another patient had undergone balloon plasty of subclavian vein. Stenting was performed in 3 patients. 1 patient with in-stent stenosis underwent angioplasty.

### Conclusion

- Stenting and balloon angioplasty are viable options for endovascular management of complications occurring in patients of hemodialysis with arteriovenous fistula, to maintain the patency of the vascular access.
- The technical success rate of stenting is more than balloon angioplasty.
- The primary patency rates, in stenting and balloon angioplasty, decrease over a period of 12 months.
- The primary patency rates of stenting are higher than balloon angioplasty at respective time points.
- Failure of primary intervention may occur over the period of time due to in-stent stenosis or thrombosis, which necessitates the need of secondary intervention.