



ASSESSMENT OF ARTERIO-VENOUS FISTULAE RESULT IN CKD PATIENTS UNDERGOING HAEMODIALYSIS

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ABSTRACT

- We conducted a study on 50 Av fistula patients ,to assess artificial AVF result in CKD Patients undergoing haemodialysis .Our objectives were ,to evaluate the patency of AVF upto period of 6 months, to assess the complications of AVF to clinically assess the arterialization of vein and to evaluate the need for alternate site for fistula.
- We Included
 - Patients undergoing A-V Fistula surgery under IPD and OPD basis in Bharati Hospital and Research Centre.
 - Both sexes are included.
 - Age above 70 years and less than 18years.
- We Excluded
 - Patients who did not give consent.
 - All patients undergoing AVF surgery prior to renal transplant.

KEYWORDS

A-V fistula,CKD,Arterialization

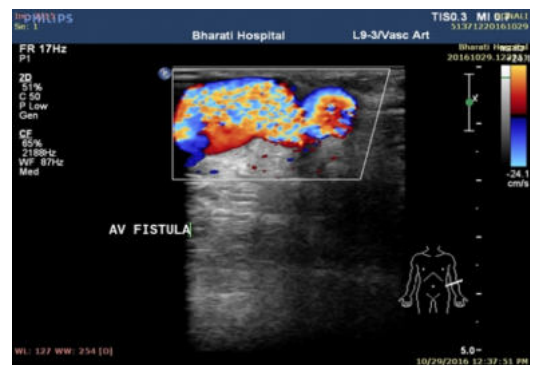
Introduction:

Arteriovenous fistula (AVF) is an abnormal communication between an artery and a vein. These communications are congenital; can occur at any point in the vascular system; and vary in size, length, location, and number. AVF is a term reserved for a singular communication between an artery and a vein that usually has an acquired etiology.

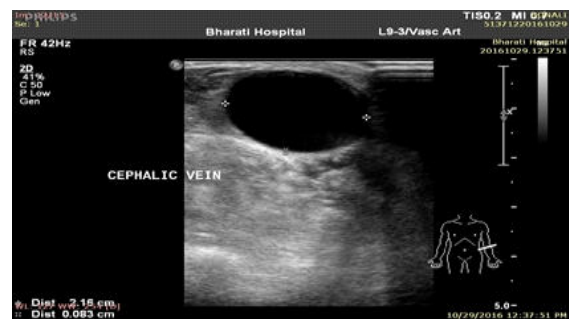
The 1st recorded case of an arteriovenous malformation (AVM) was in the late 16th century. In 1757, Hunter described an AVF as an abnormal communication between an artery and a vein. Krause in 1862 used injection studies of an amputated specimen to characterize the abnormal vasculature. In 1875, Nicoladoni described the reflex slowing of the pulse following occlusion of an artery proximal to an AVM.

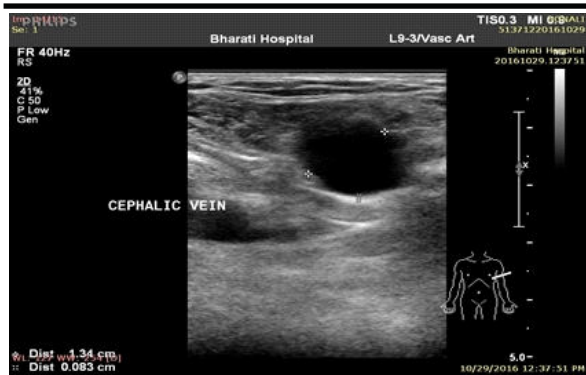
In 1920, Halsted contended that an AVM could produce cardiac enlargement and observed that a congenital AVF without a nevus is rare. In 1936, Holman described the pathophysiology and natural history of AVMs; this publication forms the basis for today's knowledge. In 1967, Fontaine observed that puberty or pregnancy can cause enlargement of AVMs.

OSERVATION

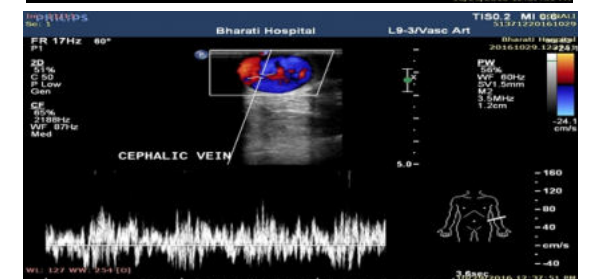
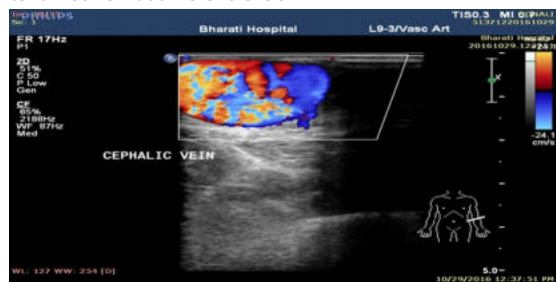


This figure shows mixed blood pattern in the vessel due to fistula formation





This figure shows the diameter and wall thickness of the arterialized vein at different levels



The above first figure shows arterIALIZATION of cephalic vein and the flow pattern in the second figure

RESULTS

1. Out of 50 cases who underwent AV Fistula, 1 (2.0%) had age less than 20.0 years, 7 cases (14.0%) had their age between 20.0 – 39.0 years, 20 (40.0%) had their age between 40.0 – 59.0 years and 22 cases (44.0%) had their age between 60.0 – 79.0 years.
2. Out of 50 cases who underwent AV Fistula, 36 (72.0%) were males and 14 (28.0%) were females. The male: female sex ratio was 2.6: 1.0
3. Out of 50 cases who underwent AV Fistula, 25 (50.0%) had diabetes mellitus, all (100.0%) had hypertension, 24 cases (48.0%) were alcoholic and 17 cases (34.0%) were smokers
4. Out of 50 cases who underwent AV Fistula, 29 (58.0%) had Brachio Cephalic site operated, 11 cases (22.0%) had Radio cephalic site operated and 10 (20.0%) had Brachio Median Cubital site operated.
5. Out of 50 cases who underwent AV Fistula, 13 (26.0%) died during 6-months post-op follow-up and the overall survival rate was 74.0%.
6. Out of 37 cases who completed the 6-month post-op follow-up, 9 (24.3%) had failure of AV fistula and the overall success rate of AV fistula was 75.7%.
7. Out of 37 cases who completed the 6-month post-op follow-up, 6 (16.2%) had the incidence of new fistula.
8. Incidence rate of failure of AV fistula was more in

female[33.3%] than male[20.0%] between the cases with diabetes[26.3%] and the cases without diabetes[22.2%]

9. The incidence of failure of AV fistula did not differ significantly between the alcoholic cases[26.3] and non-alcoholic cases[22.2%]
10. The incidence of failure of AV fistula differed significantly between the Smokers [15.4%]and non-smokers cases[29.2%]
11. Average Arterialisation in cms in Immediate Post-op Day 0 cm, Post-op 1 Month 3.65cm, Post-op 3 Months 4.26cm and Post-op 6 Months 4.81cm.
12. 9(24.3%) AV fistulas failed, all due to thrombosis.
13. 6 AV fistulas failed before 1st follow up(before 1st month) , 2 AV fistulas failed before 2nd follow (before 3rd month) and 1 AV fistula failed before 2nd follow up (before 6th month)
14. 3 patients died before 1st follow up (before 1st month) ,7 patients died before 2nd follow up (before 3rd months) and 3patients died before 3rd follow up (before 6th month).
15. All patients were hypertensive and anaemic.

DISCUSSION

We studied a series of 50 cases in our institute of AV Fistula in which we had the following results which we have discussed ahead.

In our study the youngest age group which underwent AV fistula was 20yrs old so just 2% and highest incidence of AV Fistula was seen between age group of 60-79 years i.e 44%,similar results were obtained in study by **Guofen Yan et al,(2013)** where lowest age was 18 yrs and highest 80 yrs with incidence rate 17% and 11.7% respectively^[12]. In another study by **Seyed Saeed et al,(2003)** there was a significant correlation between age and duration of the fistula patency,however ,no correlation was found between the age of the patients and the frequency of complications^[11].

We noticed that 36% were male and 28% were females so male to female ratio was 2.6:1.0. In a study by **Miller CD et al,(2016)** on gender differences in outcomes of arteriovenous fistulas in hemodialysis patients ,the prevalence of arteriovenous (A-V) fistula use is lower among female than male hemodialysis patients^[2].

In our study it was noticed all patients were hypertensive 100% whereas 34%were smokers,48% were alcoholic and 50% were diabetic however in **P J Griffin et al,(1983)** did a study in which the incidence of fistula failure was significantly higher in smokers^[8].

And study by **Mortaz et al,(2013)** it was seen that diabetes did not play significant role in survival rate in comparison to non diabetic group^[1]

In our study 58% cases underwent AV Fistula at brachio-cephalic site, a similar study by **Murphy GJ et al,(2002)** on Brachiocephalic Arteriovenous Fistula through the Median Antecubital Vein for Hemodialysis supports the use of BC- AVF through MAV- AVF in patients with favorable vein configurations at the elbow^[5].

In our study the survival rate after undergoing AVF was as high as 74% it was almost similar to study by **Murphy GJ et al, (2002)** survival rate was 75.7%^[5].

In our study patients who completed the 6-month post-op follow-up, 9 (24.3%) had failure of AV fistula and the overall success rate of AV fistula was 75.7%, in a study by **Carrie A et al,(2011)** found that the primary failure rate was 37.1% , artery size being

predictor of AVF patency^[4].

In our study 16.2% cases underwent new fistulas similarly **Dr Goutham Gopinath et al,(2016)** concluded the following in their study, the primary patency rate was 70% at three months and 59% at six months. Failing arteriovenous fistula was managed by new arteriovenous fistula in their series. 26% patients had redo arteriovenous fistula^[9].

In our study it was noticed that failure rate was more in females 33.3%. Similarly in study by **Miller et al,(2003)** on Gender differences in outcomes of arteriovenous fistulas in hemodialysis patients^[2] found that fistula adequacy for dialysis was lower in women than men (31 vs. 51%, P=0.001).^[2]

In our study there was no significant difference in failure rate between Diabetic 26.3% or Non-Diabetic 22.2% patients, where as in a study by **Seyed et al,(2013)** stated old age or diabetes per se did not significantly predispose a new fistula to primary failure^[1].

Also in a study by **Murphy GJ et al,(2002)**^[5] where they concluded that diabetes mellitus has no significant detrimental effect on outcome following formation of autogenous elbow fistulas for haemodialysis.

In our study the overall survival rate was 74.0% similar even in a study by **Shrestha PC¹ et al,(2007)** it was concluded that overall fistula survival rates were 85.1%^[11].

In our study 15.4% patients were smokers and 29.2% were non-smokers where as in study by **Gheith et al,(2008)** they concluded that smoking are the main risk factors of vascular access failure^[6].

100% patients were hypertensive in our study and also **Maura Ravera et al,(2006)** have proved that all patients of CKD suffer from hypertension in a very early stage^[10].

In our study we opted a clinical way to find out arterIALIZATION of AV Fistula in which we concluded that there is no arterIALIZATION in immediate post-op however in the follow ups it was found that the minimum average length of arterIALIZATIONS noted by clinical palpatory method was 2.8cm, post-op 1 Month 3.65cm, Post-op 3 Months 4.26cm and Post-op 6 Months 4.81cm, however no study has been conducted on the clinical palpatory method for arterIALIZATION which we did try to correlate with doppler method which is a proven method to look for arterIALIZATION of veins.

CONCLUSIONS

- 1) Age has no significance in the making of AV fistula as it can be created from paediatric age group to old age.
- 2) CKD was more common in male patients hence AV Fistula were done more in males than females.
- 3) All patients of CKD are prone to Hypertension however Diabetes, alcohol and smoking has no significant role in AV Fistula.
- 4) The commonest sites of AV Fistula is brachiocephalic and radiocephalic.
- 5) Overall success rate of AV Fistula is high (74%).
- 6) Only 6 (12%) patients underwent redo fistula.
- 7) More failure rate is seen in females than males
- 8) ArterIALIZATION is normally noted by Doppler method however in this study clinically arterIALIZATION was noted shortest being 2 cms and longest being 8cm.
- 9) Only Complication noted was thrombosis (24.3%).
- 10) Reason of failure of AV Fistula was immaturity of AV fistula in

immediate post-op.

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