



COMPLICATIONS OF ARTERIOVENOUS FISTULA CREATION FOR VASCULAR ACCESS

Dr. P. Bala Murali Krishna	M.S., M.Ch (urology), associate professor, department of urology, DR. PSIMS and RF, Andhra Pradesh.
Dr. Vyoma Desai*	Second Year Resident, Department Of Urology, DR. PSIMS and RF, Andhra Pradesh. *Corresponding Author
Dr. P. Bala Susheeth Kumar	First year resident, department of urology, DR. PSIMS and RF, Andhra Pradesh.
Dr. Bhushan Phate	First year resident, department of urology, DR. PSIMS and RF, Andhra Pradesh.
Dr. P. Pavan Sai	M.Ch (urology), associate professor, department of urology, DR. PSIMS and RF, Andhra Pradesh.
Dr. U. Suryakumari	M.Ch (urology), professor and head of department, department of urology, DR. PSIMS and RF, Andhra Pradesh.

ABSTRACT

Introduction: Patients with end-stage renal disease (ESRD) who are waiting for a kidney transplant can receive temporary treatment with haemodialysis (HD). Dialysis access is a long-term necessity as a result of this circumstance. Fistulas are surgically made connections between an extremity's native vein and artery. AVFs usually have modest overall complication rates, ranging from 0% to 16%. **Aims And Objectives:** To study about the prevalence and management of complications of arteriovenous fistula creation surgery for vascular access. **Materials And Methods:** a four-year retrospective analysis of 300 patients who had arteriovenous fistulas created for haemodialysis access. **Results:** 65.6% patients were males and 34.3% were females. 70% patients underwent radio cephalic fistula creation and 30% patients underwent brachiocephalic fistula creation. 40.6% patients had pre-emptive fistula creation. 10% patients developed primary failure of fistula. 6.67% patients developed secondary failure. 2% patients had wound infection. 20% patients had upper limb edema. 5% patients developed aneurysm at fistula site. 0.67% patients had paraesthesia over dorsal aspect of thumb and index finger. 1.67% patients presented with aneurysm rupture and profuse bleeding requiring blood transfusion. **Conclusion:** Arteriovenous fistula creation surgery also has its own set of complications. Some factors which can help to prevent these complications are careful selection of cases, pre operative doppler ultrasound to map the vessels, proper and meticulous surgical technique and appropriate haemostasis.

KEYWORDS : arteriovenous fistula creation, radiocephalic, brachiocephalic, complication, haemodialysis

INTRODUCTION:

Patients with end-stage renal disease (ESRD) who are waiting for a kidney transplant can receive temporary treatment with haemodialysis (HD). Dialysis access is a long-term necessity as a result of this circumstance. AVFs, or arteriovenous fistulas, are surgically produced connections between an extremity's native vein and artery^[1] AVFs usually have modest overall complication rates, ranging from 0% to 16%.^[1] AVFs include basilic vein transposition (brachial-basilic) fistula, brachiocephalic fistula, and radiocephalic fistula. The high rate of primary failures, which can be attributed to either early thrombosis or a lack of maturation, is a significant issue with AVFs. According to studies, there is a significant financial cost and morbidity linked to fistula problems^[9,10]

Aims And Objective:

To study about the prevalence and management of complications of arteriovenous fistula creation surgery for vascular access.

MATERIALS AND METHODS:

300 patients who had arteriovenous fistulas made for haemodialysis access at DR. PSIMS and RF throughout a 4-year period were included in this cross-sectional study. The study comprised all patients between the ages of 18 and 75 who had arteriovenous fistula formation at our facility between September 2020 and September 2024.

RESULTS:

300 patients undergoing AVF creation were included in the study. Out of them, 197 (65.6%) patients were males and 103 (34.3%) were females. 210 (70%) patients underwent radio cephalic fistula creation and 90 (30%) patients underwent brachiocephalic fistula creation. All surgeries were performed under local anaesthesia and average duration was 1.5 hours. Only 122 (40.6%) patients had pre-emptive fistula creation and remaining 178 (59.3%) were already on maintenance haemodialysis through central venous access. The average pre-operative cephalic vein diameter was 3.4 at the elbow and 2.3 at the wrist. At six weeks, the average post-operative flow through the fistula was 600 ml/s. 30 patients (10%) developed primary failure defined as

failure of functioning of fistula within one month of surgery. 20 patients (6.67%) developed secondary failure (after one month of surgery). 2% patients had wound infection which presented with wound gaping, seropurulent discharge from surgical or ulceration. 20% patients had upper limb edema. Out of 300, 15 (5%) patients developed aneurysm at fistula site. 6 out of 15 patients developed aneurysm within first 3 months of surgery. 7 out of 15 patients had pseudoaneurysm on doppler ultrasonography. Only 2 patients (0.67%) had paraesthesia over dorsal aspect of thumb and index finger. 5 out of 300 (1.67%) patients presented with aneurysm rupture and profuse bleeding requiring blood transfusion.

DISCUSSION:

The cause of primary AVF failure is mostly due to pre-existing morphologic abnormalities of the vessels. Approximately 30.6% of participants in research by Cavallaro et al.^[16] had more than one chronic condition. Aneurysm and thrombosis were the most often reported consequences.^[17] Studies indicate that being a man was linked to a higher chance of problems.^[18, 19] According to Nakagawa et al., aneurysm happened in 6.6% of patients, but thrombosis with AVF dysfunction was the most frequent consequence (70.8%).^[20] Lymphedema, infection, aneurysm, stenosis, congestive heart failure, steal syndrome, ischemic neuropathy, and thrombosis are among the significant side effects of fistulae, per the published research.^[21] Selecting the right surgical method for anastomosis is crucial. At the moment, end-to-side anastomosis is the most popular method^[22-24] Outflow vein diameter, artery diameter, and vein and anastomosis flow rate are factors that affect the result [25]. Twenty percent of all problems are caused by infections, with perivascular cellulitis being the most prevalent type. The quality of the accessible vasculature, or hemodynamic variables, is the most significant aspect in determining the effectiveness of an AVF. It is essential to perform pre operative doppler.^[28] According to a recent study by Bae et al., autologous AVF is the preferred vascular access method for older individuals.^[29]

CONCLUSION:

Arteriovenous fistula creation surgery also has its own set of

complications. Some factors which can help to prevent these complications are careful selection of cases, pre operative doppler ultrasound to map the vessels, proper and meticulous surgical technique and appropriate haemostasis.

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