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RESEARCH ARTICLE

EFFICACY OF BASILIC VEIN TRANSPOSITION IN THE FOREARM FOR SECONDARY ARTERIOVENOUS FISTULA CREATION.

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Abstract

Radiocephalic fistulae remain the first choice access for hemodialysis. The antecubital fossa cephalic vein is recommended as the next site. However, if the both options are failed basilic vein is the next option. We report a series of patients where the forearm basilic vein served as an alternative conduit for fistula creation. Over one year period, 15 patients who had a failed radiocephalic(RC) and brachiocephalic(BC) fistulae underwent a basilic vein transposition in forearm. The immediate results were satisfactory. All fistulae were successfully cannulated. Primary patency was 73.3% at 1 year. No ischemic or infectious complications were noted during the study period. The use of the forearm basilic vein to create a native arteriovenous fistula appears to be a good next option, thus preserving more proximal basilic veins for future use.

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Introduction:-

The increasing number of elderly and diabetic patients with end stage renal disease treated by hemodialysis requires different access strategies. It is essential to secure and maintain vascular access for proper dialysis in patients receiving maintenance hemodialysis. The National Kidney Foundation Kidney Disease Outcomes Quality Initiative (NKF/KDOQI) guidelines published in 2006 encouraged the use of autogenous arteriovenous fistulas (AVFs), emphasizing that they could maintain long life spans with minimal complications and interventions[1]. Forearm basilic vein could be used as an alternative for arm basilic vein transposition, providing another option for autogenous hemodialysis access[2]. It could be used in patients with failed direct AVFs, such as radial-cephalic direct wrist access or brachial-cephalic upper arm direct access. With the initial successes performing FBVT in our hospital, we hypothesized that FBVT could be done safely with an acceptable long-term patency and few complications.

Methods:-

Study period from august 2015 to august 2016, over one year period, 15 patients with failed RC and BC fistula underwent forearm basilic vein transposition. All patient underwent clinical evaluation with duplex scan, radial and ulnar artery diameter > 2.5 mm and basilic vein diameter > 3 mm taken as inclusion criteria. All patients were hypertensive, 3 patients were diabetic, and 2 patients were cardiac.

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All patients underwent procedure under regional anaesthesia in the form of brachial plexus block with using 1% lignocaine. In some cases local infiltration of 1% lignocaine was used during basilic vein harvest. All cases were given 2500 IU of heparin before anastomosis.

Surgical technique:-

Vertical incision made along the course of basilic vein from medial border of forearm upto medial condyle of humerus. Care was taken to avoid injury to the overlying cutaneous nerves. Side branches tied and divided and the vein was gently distended with heparin saline. With separate vertical incision ulnar artery/radial artery were exposed and controls taken. After adequate distension of basilic vein, subcutaneous tunnel were created between the most cephalad portion of the basilic vein and ulnar/radial artery[Fig 1a&b]. Before anastomosis 2500 IU of heparin was given and end to side anastomosis performed.



Figure 1a&b:- showing intraoperative basilic vein transposition to create radial-basilic vein fistula.

Results:-

15 patients have been operated with 13 male and 2 female[Fig 2]. 100% success rate in the immediate postoperative period. On follow up period, in 4 patients fistula were thrombosed[Fig 3]. 3 patients had failed fistula before their hemodialysis within 2 months and one patient had post hemodialysis failure after 10 months[Fig 4]. Both female patients fistula had thrombosed. Primary patency rate is 73.3% at 1 year follow up. In our study group 3 patients were diabetic, in which 2 patients have good functioning fistula and one had failure.

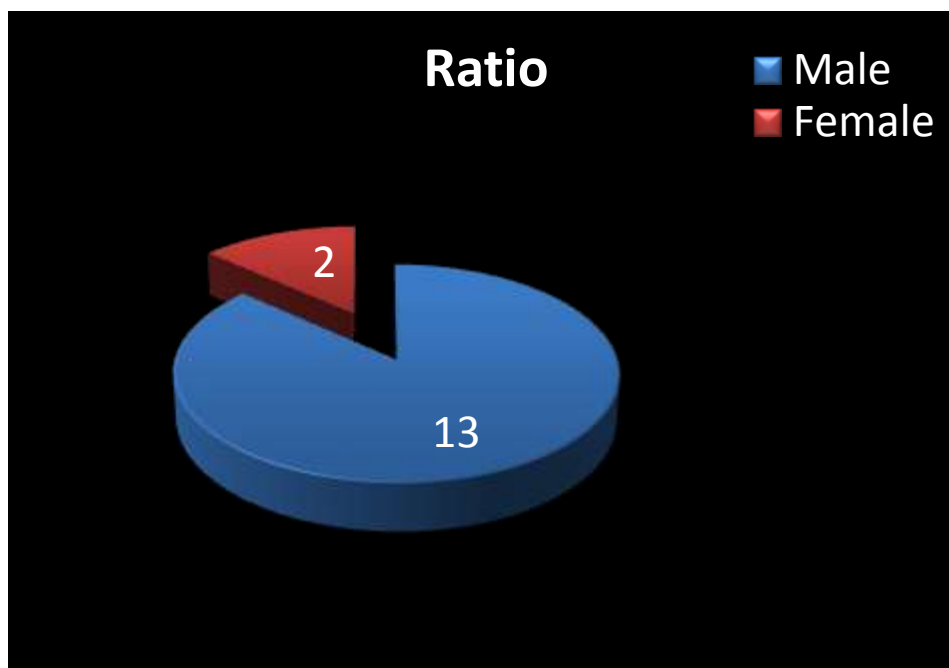


Figure 2:- Ratio of male and female who underwent basilic vein transposition.

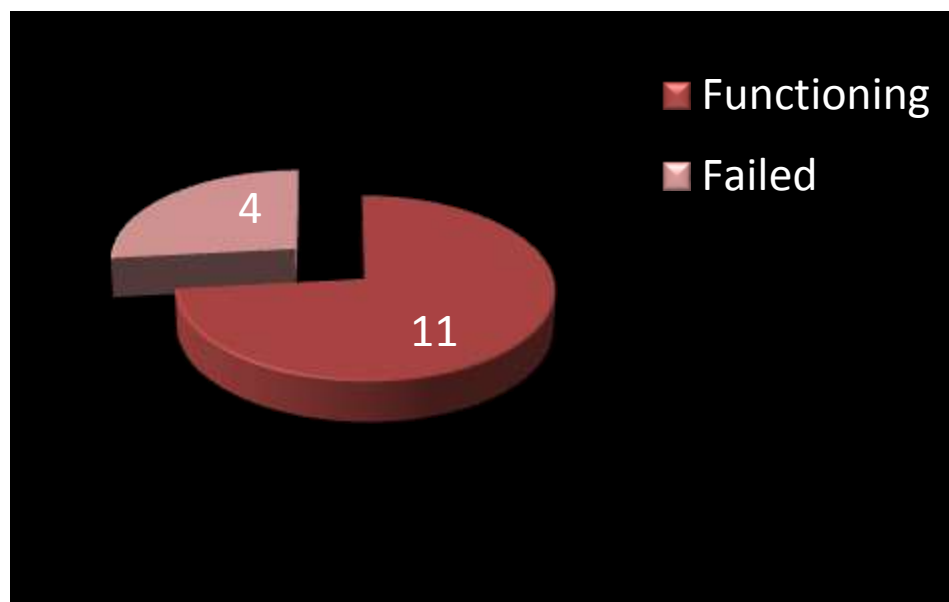


Figure 3:-post-operative status of fistula on follow up

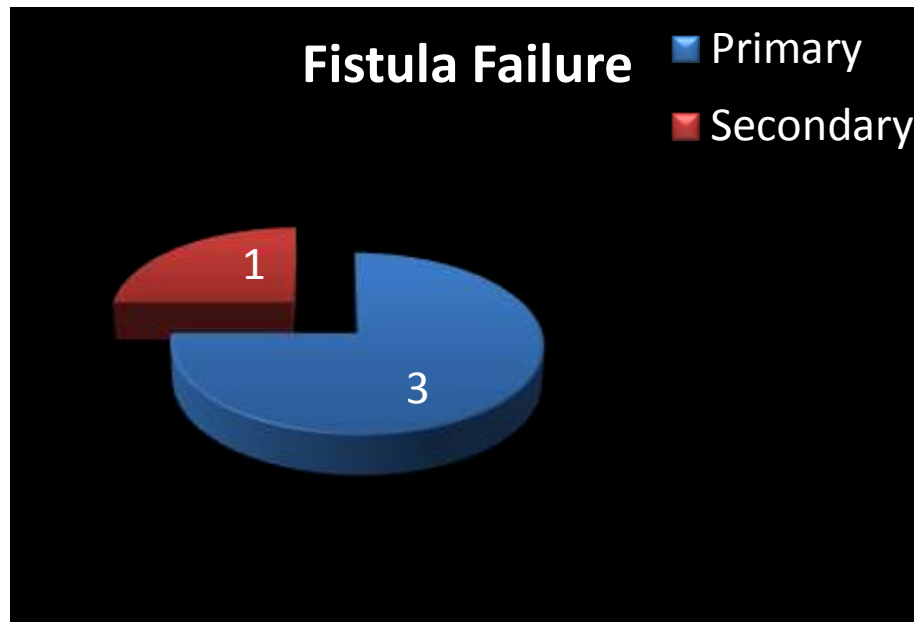


Figure 4:-Ratio of primary and secondary fistula failure on follow up

Discussion:-

Series of fistulae using a radial and ulnar artery with native or transposed basilic vein were described recently with more satisfactory results[3]. Autogenous conduits are preferable to the use of prosthetic grafts because of improved patency and lower risk of infection[4-5]. Although there is a clear preference for primary autogenous RC fistulae, the need for secondary and tertiary options is increasing due to the growing hemodialysis population, particularly in the elderly population.[6] A problem of high-output heart failure subsequent to fistula creation became disputable recently.[7] This serious complication particularly affects upper arm location, especially brachiocephalic (BC) fistula.[8]. The rationales for performing an FBVT before an AVG can be summarized as follows: First, the patency rate of the FBVT is comparable with that of an AVG. Second, infectious complication is far less in a FBVT. Third, even if the FBVT does not increase in size enough to be used for dialysis, it may contribute to a larger upper arm basilic vein, which then could be used for long-term dialysis.

The remaining concern about the FBVT is the high maturation failure rate. We think this can be reduced with careful patient selection. To increase the use of the FBVT, careful examination for the presence of a forearm basilic vein by a vascular surgeon is very important. Frequently, uninjured forearm basilic vein could be found and offered a good conduit for long-term hemodialysis. During the procedure medial tributaries of basilic vein has to be preserved for future arm brachio-basilic fistula creation. Primary patency at 12 months in our series is 73%. Fistula salvage not done in our patients as it increase the cost to the patients, alternatively we create upper arm basilic vein transposition in those failed FBVT.

Conclusions:-

This study shows that the forearm basilic vein transposition has an acceptable high one year patency rate and fewer complications and is good alternative to arm basilic vein transposition to reduce the high output cardiac failure and arm edema.

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