

USE OF DISTAL VENOUS LIMB AS A CONDUIT FOR INTRA OPERATIVE CONFIRMATION OF ARTERIOVENOUS FISTULA FLOW

Abdol Hassan Talaiezhadeh¹

ABSTRACT

Background: Thrombosis due to low blood flow in Arterio Venous Fistulas (AVF) created in extremities of Chronic Renal Failure (CRF) patients is a common cause of primary failure of AVF. Thrombosis commonly occurs primarily in inflow arterial limb or outflow venous limb during anastomosis caused by proximal and distal vessels control. Spasm of the supplying artery can accelerate this phenomenon.

Objective: In this clinical trial, we used distal venous limb as a conduit for revision and reconfirmation of blood flow in AVF at the end of operation.

Setting: University Hospitals of Imam Khomeini and Sina during 1994 to 2002.

Methods: Three hundred seventy eight CRF patients were operated on the upper extremities by this technique. We revived AVF blood flow by washing with a catheter and proximal arterial limb dilatation through distal venous conduit.

Results: Two hundred sixty (68.8%) out of 378 patients had inadequate blood flow in AVF at the end of operation. Using distal venous conduit we could successfully reestablish acceptable blood flow with good thrill in 242(93%) of them.

Conclusion: Use of distal venous limb as an intraoperative conduit for revision and reconfirmation of blood flow of AVF can prevent primary thrombosis and failure of AVFs.

KEY WORDS: AVF, Vascular access, Hemodialysis.

Pak J Med Sci July - September 2006 Vol. 22 No. 3 308-309

INTRODUCTION

Initial and early thrombosis due to low blood flow resulting in failure of AVF is a common problem in Hemodialysis patients.¹ Moreover, low blood pressure especially during hemodialysis, subcutaneous bleeding and hematoma due to damage to the superficial vessels by inappropriate venous puncture, thrombosis and stenosis of central veins due to subclavian and other central venous catheterization for dialysis, arterial thrombosis or stenosis in

atherosclerotic diabetic patients and narrowing of vessels in children, all can cause failure of AVF.¹⁻³ However, technical errors and primary thrombosis of inflow or outflow of AVF in extremities is one of the common causes of primary failure of A.V fistulas.^{3,4} Vascular controls during anastomosis may precipitate thrombosis leading to low blood flow and early failure of AV fistulas. Washing of arterial and venous limb of AVF by a venous conduit with heparinized saline may be a way for prevention of primary thrombosis in AV fistulas.

In this study we tried lowering the incidence of primary thrombosis and failure of AVFs by using distal venous limb as a conduit for revival of blood flow in fistulas at the end of anastomosis.

METHODS

In this intra operative clinical trial 378 patients suffering from Chronic Renal Failure (CRF) that need AVF for hemodialysis were

1. Dr. Abdol Hassan Talaiezhadeh
Assistant Professor of Surgery,
Department of Surgery,
Imam Khomeini Hospital, Medical School,
Ahwaz Jundishapour University of Medical Sciences,
Ahwaz, Iran.

Correspondence:

Dr. Abdol Hassan Talaiezhadeh
E-mail: ahtalaiezhadeh@ajums.ac.ir

* Received for Publication: June 28, 2005

* Accepted: February 15, 2006

operated upon using this technique. The patients were referred to University Hospitals of Imam Khomeini and Sina during 1994 to 2002.

All patients were operated on the upper extremities. We mainly approached through the snuffbox of the left hand. After exploring cephalic vein and radial artery we applied band control on all flow limbs of anastomosis (proximal & distal of vein, proximal & distal of artery). After making side-to-side anastomosis with 6/0 prolene, proximal vein and artery are released from control and distal venous limb was left as an intraoperative conduit for revival of blood flow. If blood flow of fistula was inadequate or did not have a good thrill, by catheterization of proximal artery and through distal venous limb and washing micro thrombosis or dilatation of spastic artery we tried to establish and reconfirm adequate blood flow. Finally we closed distal venous limb after certainty of good blood flow that result in end- to- side AVF.

RESULTS

In 378 patients operated by this technique, 260 (68.8%) patients had inadequate blood flow in fistula and we didn't palpate a thrill at the end of anastomosis. So with the use of distal venous conduit arterial inflow and venous outflow was revived and with catheterization of proximal limbs by washing or dilatation of proximal artery we established adequate blood flow with a good thrill in 242 (93%) of the patients. In the remaining 18 patients, we failed to have good and palpable thrill at the end of operation. But in 10 of these palpable patients good thrill appeared on the following day (sum 98%). In eight (2%) of patients didn't achieve adequate flow in fistula and thrill at all and failed.

DISCUSSION

One of the problems in CRF patients for hemodialysis is vascular access. The best type of vascular access in these patients is native arteriovenous fistula in distal of upper extremities.⁵ In addition to technical errors, unsuitable

veins in upper extremities, low blood pressure and arteriosclerosis of distal arteries especially in diabetic patients can result in failure of AVFs in hemodialysis patients.⁶⁻⁸

However, patency of proximal vessels and establishment of good blood flow in a successful AVF is very important. Adequate flow requires a patent arterial inflow and venous outflow at the end of anastomosis.⁹ With this technique, by using distal venous limb as a conduit during operation, we could revive proximal vessels of AVF and treat any primary thromboses or arterial spasm with washing and dilatation. After confirmation of proximal patency and adequate blood flow with a good thrill by ligation of distal conduit we secured an end-to- side AVF. So we believe this technique can reduce the initial thrombosis rate in these anastomosis.

REFERENCES

1. Townsend CM, Beauchamp RD, Evers BM, Mattox KL. Sabiston textbook of Surgery. 16th ed. Philadelphia; Saunders Company, 2001; 1450-62.
2. Veith FJ, Hobson RW. Vascular Surgery: Principles and Practice. 2nd ed. New York, McGraw-Hill, 1994; pp 1025-38.
3. Kim YO, Yang CW, Yoon SA, Chun KA, Kim NI, Park JS, et al. Access blood flow as a predictor of early failure of native arteriovenous fistula in hemodialysis patients. *Am J Nephrol* 2001; 21(3): 221-5.
4. Steuer RR, Miller DR, Zhang S, Bell DA, Leyboldt LK. Transcutaneous determination of access blood flow rate. *Kidney Int* 2001; 60(1): 284-910.
5. Schwab SJ, Harrington JT, Singh A, Roher R, Shohaib SA, Perrone RD, et al. Vascular access for hemodialysis. *Kidney Int* 1999; 55(5):2078-90.
6. Schwab SJ, Oliver MJ, Suhocki P, McCann R. Hemodialysis arteriovenous access: detection of stenosis and response to treatment by vascular access blood flow. *Kidney Int* 2001; 59(1): 358-62.
7. Hirth RA, Turenne MN, Woods JD, Young EW, Port FK, Pualy MV et al. Predictors of type of vascular access in hemodialysis patients. *JAMA* 1996; 276(16): 1303-8.
8. DeMarchi S, Falletti E, Giacomello R, Stel G, Cecchin E, Sepiacci G, Bartolotti N, et al. Risk factors for vascular disease and arteriovenous fistula dysfunction in hemodialysis patients. *J Am Soc Nephrol* 1996; 7(8): 1169-77.
9. Miller PE, Tolwani A, Luscy CP, Deierhoi MH, Bailey R, Redden DT, et al. Predictors of adequacy of arteriovenous fistulas in hemodialysis patients. *Kidney Int* 1999; 56(1): 275-80.