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*The secondary hemodialysis vascular access created through
the basilic vein transition on the forearm*

A well-functioning vascular access is the prerequisite for chronic hemodialysis treatment. The formation of the comfortable hemodialysis vascular accesses seems to be a very important problem for patients with chronic renal insufficiency.

The theoretical progress and new technical possibilities can improve the quality of patient life and can prolong the period of normal functioning of a fistula. Dialysis access failure and the limited period of the fistula function remained the most frequent cause of hospitalization for patients with end-stage renal disease.

The described in 1966 by Quinton and Scribner external shunt was replaced by subcutaneous fistulas for the multiple use (7). The described above arteriovenous Brescia-Cimino fistula is the most often used vascular access. In patients, in whom the usual sites for arteriovenous fistula had been exhausted or in whom very poor vessels were encountered in typical place, the other vessels on the upper limb were used (1).

In 1973 Buselemer et al. performed the displacement of the distal part of the basilic vein (2). Furthermore, nineteen years later Patrich and May described a new technique of displacement of the whole basilic vein on the radial side of the forearm and also the way of surgical creation of end-to-side anastomosis between the radial artery and basilic vein (5). The mentioned above method of fistula creation is alternative to the primary mode of arteriovenous access in the distal part of the forearm for chronic hemodialysis in patients in whom the usual site for fistula has been exhausted. The use of basilic vein allows to save the arm's vessels and also to use this vessel in the later period.

MATERIAL AND METHODS

In the years 1998-2000, 8 dialysis accesses were carried out. In all cases the arterio-venous fistulas were secondary. The reasons of dysfunction of primary, classic radio-cephalic anastomosis were various.

The described above vascular accesses were performed in eight cases (3 men and 5 women) with a mean age of 47 years (36-53). All subcutaneous fistulas were created in the operating room with the patient under local anesthesia. During the surgery the 1% solution of Lignocainum or Bupivacainum

was used. The preferred route for exposure of the basilic vein was making a single incision along the arm from the wrist to the centre point of the forearm. In any case the whole basilic vein was prepared to the level of cubital fossa. When the distal part of the basilic vein has been ligated and divided, the adequate space for the graft in the tunnel was made. After the ligation of the tributaries and after the mobilization and preparation for anastomosis of the basilic vein the temporary occlusion was achieved. The use of the heparinized 0.9% sol. solution allows to restore potency of small tributaries. Next, this vein was transferred on the anterior side of arm. The tunnel was developed with blunt finger dissection. The end-to-end anastomosis between the basilic vein and the radial artery was completed using the suture material like Prolen-6.0. This technique was performed in four cases. In others, the telescopic method of fistula creation was employed (4) The perfect haemostasis in the place of the tunnel was enough and suction drain was not used. In the venous branch of the fistula the value of the flow carried out was 600-850ml/min.

Ultrasonography with high frequency sonography gave (7,5MHz) is a suitable method to obtain information about vascular access in hemodialysis patients. The flow measurements were made intraoperatively and at various intervals postoperatively using duplex Doppler sonography (6).

RESULTS

In all cases, in the period from six months to three years the regular flow through the arteriovenous fistula was observed. During the postoperative period in all patients no serious complications were visible. In spite of the type of anastomosis used in the formation of subcutaneous arteriovenous fistula the observed flow was normal.

DISCUSSION

Clinical practice shows that the period of normal function of the anastomosis use is limited. In spite of the type of anastomosis used in the formation of the subcutaneous fistula, the thrombosis associated with vascular access still represents one of the most frequent and significant problems encountered in a chronic hemodialysis patients. Thrombosis as a consequence of the arteriovenous shunt has been reported and has been attributed to a combination of venous stenosis and other factors which could made the thrombosis such as: aneurysms, haematoma, false aneurysm, anatomic vascular abnormalities and needle placement (3). It is important to rapidly recognise and evaluate the complications associated with vascular access so that appropriate intervention may be undertaken.

The necessity of secondary creation of vascular access forces surgeons to make a difficult choice of the place for localisation and kind of vascular anastomosis. The basilic vein makes the possibility of secondary creation of arteriovenous fistula but we should add that there are a lot of anatomic abnormalities of this vein.

On the basis of the data described in the literature during the past decade, one can say that the secondary use of the basilic vein on the forearm is a good way of fistula creation. Simple surgery is successful in most cases. The complications of this operation are very rare. The duration of function of such autogenic fistula is longer than the period of function of the prosthetic grafts. It is important that the earlier utilization of the basilic vein during formation of the fistula on the forearm does not exclude this vessel from the secondary creation of arteriovenous access on the arm.

CONCLUSIONS

1. The subcutaneous basilic vein transition on the forearm allows to create secondary hemodialysis vascular access along the forearm.
2. The subcutaneous basilic vein transition on the forearm allows to save the vessels on the arm, which could be used in the late period of hemodialysis.
3. The type of perfectly created arteriovenous fistula dose not influence the efficiently flow.

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SUMMARY

Hemodialysis vascular access related problems account for most hospitalizations in chronic hemodialysis patients. Having exhausted classic, primary radio-cephalic fistula on the forearm the secondary vascular access can be created. The secondary access was achieved through a subcutaneous displacement of the basilic vein and through surgical creation of end-to-end fistula between this venous and radial artery on the forearm.

The subject of the study were eight patients undergoing chronic hemodialysis. In all patients the type of anastomosis and early and late complications were studied.

The preferred route for exposure of the basilic vein was making the single incision along the forearm. Next, the basilic vein was transferred to the subcutaneous tunnel on the anterior side of the forearm. In four cases the classic end-to end anastomosis between the basilic vein and radial artery was performed. In other four patients, the telescopic method of fistula creation was done.

In all eight cases the regular flow was observed. In postoperative period no complications were noted.

Wtórny dostęp naczyniowy do dializ z użyciem przemieszczonej na przedramieniu żyły odłokciowej

Po wykorzystaniu u chorych dializowanych klasycznej przetoki promieniowo-odpromieniowej w obwodowej części przedramienia można uzyskać wtórny dostęp naczyniowy poprzez podskórne przemieszczenie żyły odłokciowej na przedramieniu i zespolenie jej z tętnicą promieniową metodą koniec do końca.

W pracy przedstawiono sposób wykonania i funkcjonowanie ośmiu takich przetok u chorych przewlekle dializowanych. Żyłę wypreparowano z cięcia wzdłuż jej przebiegu, a następnie umieszczono ją w tunelu podskórnym na przedniej powierzchni przedramienia. W czterech przypadkach wykonano klasyczne zespolenie koniec do końca z tętnicą promieniową. U pozostałych chorych zespolenie wykonano sposobem teleskopowym.

We wszystkich przypadkach uzyskano sprawny dostęp naczyniowy. Nie obserwowano powikłań zarówno we wczesnym, jak i odległym okresie pooperacyjnym.

Przemieszczenie żyły odłokciowej w tunelu podskórnym i jej zespolenie z tętnicą promieniową jest godnym polecenia sposobem wytworzenia wtórnego dostępu naczyniowego na przedramieniu.