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Arteriovenous Fistula about 400 Cases

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Abstract **Original Research Article**

***Objective*:** Native arteriovenous fistula is the choice vascular acces for chronic hemodialysis due to its longevity, low complication rate and mortality compared to arteriovenous bypasses and catheters. The aim of our study is to present our surgical experience, to evaluate our results and show the main complications. ***Methods*:** We report our experience of 604 arteriovenous fistulas created in 400 patients undergroing hemodialysis for chronic renal failure. The mean fellow up period varied one day to eight years. ***Results*:** We have observed 25% of primary thrombosis and 16% of secondary thrombosis, there were two cases of local sepsis. ***Conclusion*:** We conclude that the Cimino-Brescia fistula is superior to any other type of vascular access in patients with renal failure.

Keywords: Vascular access, renal failure, arteriovenous fistula.

INTRODUCTION

The arteriovenous fistula AVF is a surgical connection between the vein and the artery. It guarantees optimal blood flow for rapid blood filtration and thus allows dialysis exchanges [1].

Since the use of the artificial kidney in 1943, durable and easy access to superficial vessels with high flow rates has appeared decisive. Several specialists tried to solve the problem using an external arteriovenous shunt, and it was until 1966 that Brescia and Cimino showed the possibility of creating an internal arteriovenous fistula at the wrist in men between the radial artery and the dorsal vein of the thumb.

Since then, several vascular approaches have been diversified by the implantation of grafts of different types at different levels of the venous system. Internal fistulas then replace external shunts, because they also have a lower risk of infection and provide better comfort to the patient.

METHODS

We carried out a retrospective study involving 400 patients who benefited from 602 internal fistulas of the Cimino Brescia type, which represents an average of 1.5 vascular approaches per patient. Among these 400 patients, there are 226 men and 174 women.

In our study series, 248 (62%) had only one vascular access, 152 (38%) had two to five fistulas and among them 24 (6%) were finally dialyzed using a heterogeneous prosthesis. The majority of patients benefited from more than two hemodialysis sessions per week.

The time span of our observations varied from one day to eight years.

Fistulas are performed, except in special cases, under local anesthesia; it is almost always (97%) an end-to-side anastomosis performed most often (80%) at the wrist.

Postoperative heparinization by general route was only carried out in cases of hypercoagulability or after thrombosis of several previous fistulas. The use of the cubital approach has not been used because of the high rate of thrombosis of this type of fistula.

RESULTS

The appearance during the operation of a vascular spasm or thrombosis rendering the fistula not functional was observed on two occasions, controlled either by venous dilation or by unblocking in the case of thrombosis [2].

Early thrombosis constitutes the main complication. It occurred in 10 cases (2.5%), it can be suspected at the end of the intervention by the absence of quivering and breathing downstream of the fistula. Faced with this situation and if the conditions and condition of the patient allow it, immediate re-intervention is indicated. The absence or disappearance within three days following the intervention of a murmur at the level of the fistula indicates its thrombosis in adults. On the other hand, in children it can often be a spasm. It is useless or even dangerous due to the septic risk to intervene again, we must resolve to return to the patient a few days later, for a new fistula.

In 14 cases, we had to deplore two post-operative hemorrhages due to suture release or ligature release from the distal end of the vein, which we managed by reoperation.

A severe infectious syndrome occurred twice without local signs which we treated with broad-spectrum antibiotic therapy.

In 24 cases, we noted a postoperative hematoma in six cases we performed drainage (Table 1).

Table 1: Intraoperative complications

Intra opérative complications	Number n	Percentage %
Vascular wound	4	1%
Vascular spasm	40	10%
Intraoperative thrombosis	100	25%
Suture release	14	30.5%
Impossible fistula	8	2%

Secondary complications are dominated by thrombosis occurring in 76 patients or 15%, of which 4 cases were accidental due to technical error. The rest of the thrombosis was transient observed by a drop in fistula flow.

Infection constitutes the most dramatic secondary complication [3, 4], observed in 8 patients requiring emergency excision of the fistula in 6 cases. In the other cases it was a localized erythema treated medically.

The appearance of trophic disorders in the hand was noted: edema, cyanosis of the fingers and pain in 2.5%. Pseudoaneurysmal dilatation occurred in 6 patients (Tables 2 and 3).

Table 2: Immediate post-operative complications

Immediate complications	Number n	Percentage %
Hemorrhage	14	3.5%
Immediate thrombosis	6	1.5%
Hematoma	24	6%
Local infection	2	0.5%
General infection	2	0.5%

Table 3: Secondary complications occurring after the first puncture

Secondary complications	Number n	Percentage %
Hemorrhage	2	0.5%
Local infection	8	2%
General infection	2	0.5%
Secondary thrombosis	76	15%
Trophic disorders	10	2.5%
Pseudoaneurysmal dilatation	6	1.5%

DISCUSSION

The advantages of the internal fistula in chronic hemodialysis are indisputable and its quick use remains essential in acute hemodialysis. The risks of thrombosis and infection [4-6] made it abandon chronic hemodialysis. But contrary to the assertion of certain authors [7, 8], the internal fistula allows hemodialysis in good conditions.

Due to its simplicity, we prefer the creation of fistula by end-to-side anastomosis and like most authors, we believe that the arteriovenous anastomosis at the wrist described by Cimino and Brescia currently constitutes the best vascular approach in chronic renal failure.

The curve for good functioning of the fistulas gives a satisfactory patency rate at 4 years (4%), these figures are comparable to those of other authors. According to our results, neither age, nor gender, nor the diameter of the fistula, nor the use of heparin during the intervention play a significant role in the frequency of immediate or secondary thromboses. This during the

state of the arteriovenous capital seems to be a determining factor.

The existence of endophlebitis, the small vascular diameter, and calcification of the arterial wall or its thickening have an impact on the success of a fistula.

CONCLUSION

The quality of the vascular access determines the quality of hemodialysis. The Brescia Cimino AVF is the best method; but it requires rigor in its indications, its realization, its monitoring and its use. It is an easy method, within the reach of all surgeons, but its results are conditioned by the experience of the operator. Its economic implications constitute an additional argument for it not being considered as a minor intervention but carried out by or under the supervision of an experienced surgeon.

Conflicts of interest: None

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