



Integral management of vascular access by nephrologists. Three-years work outcomes

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SUMMARY

Delay in perform the arteriovenous fistula (AVF) to begin haemodialysis is a major problem in the renal units in our country. Two nephrologists initiated, to solve this problem in its own hospital, to perform AVF from december 2001 to december 31st, 2004. Results were compared to surgical service which performed AVF until december 2001. Reduction in surgical waiting time to perform AVF and percent of patients without AVF at time of initiate haemodialysis treatment are the main results in nephrologists group. No technical differences are found between both groups. These differences come from integral management of AVF, with own and programmed surgical theatre, managed in the office, individualized the patients requirements, and a major surgical flux managed by nephrologists. We conclude that hospitals with a program similar to us with integral approach of AVF and vascular access coordinator, the vascular access could be managed in an efficacy way.

Key words: **Vascular Access management. AVF. Hemodialysis. Nephrologists.**

GESTIÓN INTEGRAL DEL ACCESO VASCULAR POR LOS NEFRÓLOGOS. RESULTADOS DE TRES AÑOS DE TRABAJO

RESUMEN

El retraso en la creación de las Fístulas arteriovenosas (FAVI) constituye el principal problema en las unidades de Hemodiálisis (HD) del país. Dos de los nefrólogos de la Unidad de Nefrología del Hospital do Meixoeiro, tratando de encontrar soluciones a este problema en su hospital, asumieron la realización de las Fístulas Arteriovenosas a partir de diciembre de 2001. Se comparan sus resultados (132 FAVI entre diciembre de 2001 y diciembre de 2004) con los del Servicio de Cirugía General (268 FAVI entre noviembre de 1990 y noviembre de 2001) que las venía realizando hasta esa fecha. Se demuestra una clara reducción en el tiempo de espera de la cirugía (21,5 vs 103 días) y en el porcentaje de pacientes que inician HD sin FAVI (19 % vs 63%) en el grupo de pacientes tratados por los nefrólogos, no detectándose diferencias entre ambos grupos en los fallos primarios (21,3% vs 24,6%) ni en la supervivencia de las FAVI a los 36 meses (75% en ambos grupos). Se atribuye estas diferencias a la gestión integral de las FAVI por los nefrólogos, basada en la obtención de un espacio quirúrgico propio, en la gestión de la lista de espera según las necesidades del paciente determinadas en una consulta previa y en

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la mayor fluidez de la cirugía al ser realizada por los propios nefrólogos. Se concluye que en aquellos Hospitales que compartan una situación similar a la presentada en la comunicación, la gestión integral de las FAVI a través del establecimiento de un coordinador/unidad de acceso vascular puede ser muy efectiva en la resolución del problema.

Palabras clave: **Hemodiálisis. Acceso vascular. Gestión cirugía.**

INTRODUCTION

Delay in creation of grafted arterial-venous fistulas (GAVF) and the increase in associated morbimortality^{1,2} represent the main problems in most of hemodialysis (HD) units in the country. As a result of liberalization of indications for this type of therapy, aging of the candidate patient for HD and an increase of comorbid conditions are being observed, which account for higher difficulty establishing a definitive vascular access in this more complex population.³ This is sometimes worsened by the delay in creation of GAVF by responsible surgical teams. The consequence is that the number of temporary catheters as vascular access and of patients not having a permanent vascular access at the time of starting HD is reaching pre-occupying values.^{4,5}

This situation was occurring at the Dialysis Unit of the Hospital of Meixoeiro so that the nephrologists working at that unit, trying to resolve it, assumed surgical creation of GAVF from December of 2001 based on the experience of one of its members in this field. The aim of this study was to compare the outcomes obtained by general surgeons that were previously performing vascular accesses until that date, and raising the possibility that this action will be assimilated by some nephrology units and considered as an effective alternative, at least for these units, in order to achieve better results in creation of vascular accesses.

MATERIAL AND METHODS

An retrospective observational study was designed and carried out at the Dialysis Unit of the Hospital of Meixoeiro, located in the southern area of Pontevedra, provides health assistance to 190,000 population and has not pediatric services. The GAVF performed since the start of activity of the Nephrology Unit in November of 1990 until December 31st of 2004 were reviewed. From November of 1990 until November of 2001, GAVF were performed by the General Surgery Unit of the Hospital (GS group), and from December of 2001 until December 31st of 2004 by the Nephrology Unit (N group).

In the GS group, all the members (18 surgeons) of the surgical unit had participated in elective surgeries after the nephrologists had asked for creation of a GAVF according to the department's own scheduling criteria. During the first years surgery was mainly performed with the patient admitted to the hospital and for the last years as an outpatient; no more details can be given before 2001 because of the lack of computerized resources. Generally, the patients were examined immediately before being operated on, with no previous routine evaluation by the surgeon.

Two nephrologists started the surgical activity (sharing the remaining clinical activities of the Unit) after reaching an agreement with the Hospital Board of Directors and with the Surgical Department of fortnightly use of the operating room, performing a maximum of 3 outpatient GAVFs per day. Once the nephrologists had started this activity, the surgeons did no longer perform this activity. Patients were previously assessed at a specific Vascular Access Unit in which clinical and biochemical conditions, personal history, particularly that referring to previous vascular procedures, were assessed and physical examination, specially focused on the current vascular condition, was done. Patients scheduling was established upon creation of a waiting list prioritizing those patients with more advanced clinical and biochemical condition or had comorbid conditions that could make difficult the creation of a GAVF. During this period, the surgery was done on at outpatient basis with no need for hospital admission in any case.

The following parameters were analyzed: demographical characteristics and morbidities of both groups of patients (age, gender, etiology of CRD, and especially the existence of DM), waiting time before surgery, percentage of primary failures (defined as absence of initial functioning of the GAVF or poor

Table 1. Demographical data

	CG	N	P
Mean age (years)	59 ± 1.2	61 ± 2	0.4
Women (%)	37	36	0.9
Diabetes (%)	22	28	0.3

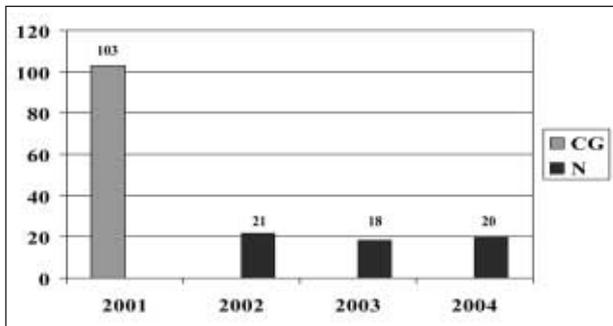


Fig. 1.—Waiting time for surgery (days).

development preventing puncture or appropriate hemodialysis flow), percentage of patients starting HD through a GAVF, GAVFs location and characteristics, as well as GAVF survival once they were punctured.

The SPSS software, version 11.5 was used for statistical analysis. The variables were expressed a mean \pm standard deviation (SD) and frequency of occurrence. Statistical tests used were the Student's t test, chi-squared test, and Kaplan-Meier and log rank tests of r survival analysis. A two-tailed hypothesis was assumed with a significance level of $p < 0.05$

RESULTS

Four hundred GAVFs were created in 261 patients during the study period, of which 268 were done by the surgeons (CG group) and 132 by the nephrologists (N group). Due to the lack of registered data before the year 2001 because of the absence statistical support, we do not know the percentage of patients out of the total number of requests in which creation of a GAVF was tried in the GS group, although we may highlight that in all patients in group N subsidiary of renal replacement therapy with HD creation of a GAVF was tried at least once.

In the GS group, imaging studies were never performed before the surgery, whereas in the group N they were done only in three patients.

There were no statistically significant differences by age, gender, or coexistence of diabetes mellitus (fig. 1).

There were important differences in the waiting time for surgery (fig. 2) that was reduced from 103 days (CG group) to 21.5 days (N group) already during the first year, with similar values during the following study years.

GAVFs were mainly radial-cephalic (71.1% vs. 68.2%) in both groups.

The rate of primary failures of 24.6 % for the GS group and 21.3 % for the N group, did not show significant differences between them (fig. 3).

Table II. Type of GAVF and % of primary failure.

	GAVF (N.º)	RC (%)	BC (%)	PF (%)
CN	268	71.1	28.9	24.6
N	132	68.2	31.8	21.3
P		0.8	0.8	0.5

RC: radial-cephalic; BC: brachial-cephalic; PF: primary failure.

There were also important differences in the percentage of patients starting on HD without a GAVF that was reduced from 63% (CG group) to 19% (N group) during the first year, and these results were maintained during the remaining study years (fig. 4).

About the survival curve of GAVFs that could be used for HD (fig. 5), similar results were obtained in both groups with values of 75% within 36 months after starting using them.

DISCUSSION

The technical quality of GAVFs performed by the nephrologists, the main initial concern of this study, turned out to be similar to that of surgeons, at least regarding outcomes on percentage of primary failures and GAVFs survival.

The most outstanding outcomes were the important reduction in the surgical waiting time and in the percentage of patients starting on HD without a GAVF in the N group.

This simple study, even with the limitations of being a retrospective study and the differences derived from the lack of computerized support before the year 2001, makes clear the important benefit that represented, for both the patient and the Dialysis Unit, that the nephrologists assumed the creation of GAVFs. This was not surprising since similar results are obtained at European hospitals where nephrologists also assumed the creation of GAVFs,^{7,8} with the added value that the percentage of patients starting HD with a definitive vascular access in those hospitals is higher than in those where GAVFs are done by surgeons, and is close to the target of 100%,⁹ which is in agreement with the outcomes obtained in this work.

Before these evidences and provided that technical differences between surgeons and nephrologists can be overcome (similar rates of primary failures and survival) in this field, then what makes the difference between them?

At least at our hospital, the main reason for the delay in creation of GAVFs lied on the inappropriate surgical response to vascular access requirements

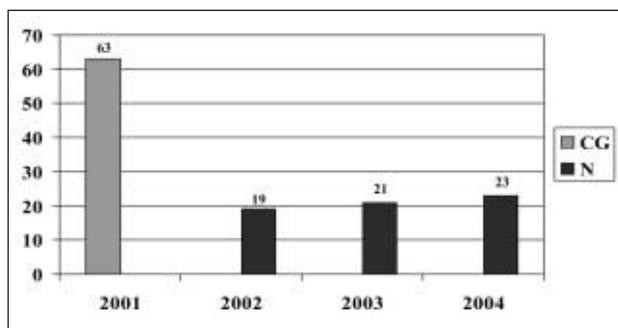


Fig. 2. — Patients (%) starting on HD without GAVF.

from the HD Unit. GAVFs were technically correct but did not timely adapt to our patients requirements, which is derived from the fact that the physician indicating the surgical intervention was not the one performing it, the latter being the one establishing his/her priority according to his/her own perspective base on the whole waiting list and resources availability.

Before this situation, usual in many hospitals from our country, the attitude adopted by the nephrologist may be determinant. At our hospital, the nephrologists assumed surgical creation of GAVFs and, at the same time, their integral management. This management included a series of procedures that are discussed below.

In the first place, two nephrologists exclusively assumed the creation and care of GAVFs, making this task compatible with the remaining tasks of the Department; in this way, all patients were studied and treated by these two nephrologists.

The second step comprised implementing a vascular access clinic where pre-surgical assessment of patients (baseline pathology, degree of CRD, and vascular condition) was carried out, which allowed for establishing a waiting list with surgical priority for those cases in which greater difficulty in establishing a GAVF was expected or with more rapid progression of renal disease subsidiary of dialysis. Pre-surgical assessment of the patients, and in particular detailed physical examination of the upper limbs was sufficient in most cases to determine the type of GAVF to be performed.

The third measure comprised obtaining a surgical facility, exclusive for use and not interfering with the general surgical activity of the hospital. The importance of this fact lies on something as simple as only performing GAVFs when surgical facilities are available independently of the general surgery waiting lists. Finally, the fourth step comprises the creation of GAVFs by nephrologists themselves, which guarantees that the established surgical priority is strictly followed.

The results obtained at our Unit with these measures promote trying to apply them in those hospitals with similar conditions. All these measures mentioned may

be assumed without great difficulties with the exception of surgical creation of GAVFs. There are arguments pro and against this possibility. In the first scenario, GAVF is a surgical procedure and nephrologists are not surgeons, so that it seems reasonable that GAVFs should be performed by health professionals with expertise, that is to say, vascular surgeons, and if not, any other surgical team wanting to assume this task. This is the case in most of the hospitals worldwide. In addition to the outcomes previously mentioned, another argument for is that several experts on GAVF, well-known for their scientific communications, are nephrologists.^{6,7,8} In certain countries, most of initial GAVFs are done by nephrologists themselves.⁹ There are groups of nephrologists with an attitude in favor of higher interventional practice (an attitude that has led to the creation of a Society of Diagnostic and Interventional Nephrology), which with time will lead nephrologists to do GAVFs.^{10,11,12} In our setting, not reaching this far end, Nephrology is one of the most interventional medical specialties (placement of vascular and peritoneal catheters, performance of renal biopsies). The fact that nephrologists would do GAVFs is just another step forward by acquiring training and expertise in another surgical technique.

Therefore, it would not be an extravagant idea that nephrologists would progressively assume performance of GAVFs in those centers where they could, i.e., centers with enough personnel and the surgical ability required of at least one of their members, and especially the willingness to do it; spreading of this idea will depend on several factors (the decision of assuming a task that until now is not strictly within their working area, assumption of this activity by scientific societies and Specialty National Commission, greater and better surgical training during the fellowship training, and even later on, sufficient human resources, etc.) among which the willingness from the part of the nephrologists to assume this task

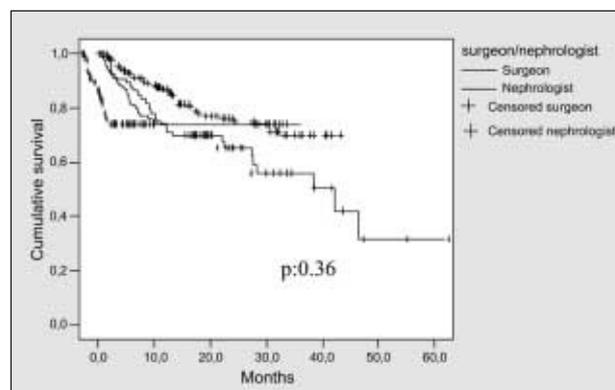


Fig. 3. — GAVF survival.

will be essential and that could significantly contribute to resolve once for all the problem with vascular accesses.

As a final conclusion of what has been discussed, in those hospitals in which the lack of an adequate response from Surgical Departments represents the main factor in the delay of GAVF creation it is important to establish the position of «member in charge of vascular accesses» among the nephrologists, an individual with close dedication to this issue put into practice as the Coordination of Vascular Accesses. Its task would be managing GAVFs by obtaining a slot in the operating room schedule for this kind of surgery, starting the Vascular Access Clinic, and implementing a waiting list with priorities derived from patient's needs, and ideally, also performing GAVFs. In those centers in which this task may be assumed, this is likely to represent the most effective measure for fighting against the delay in creation of vascular accesses. If the nephrologist does not want or cannot perform GAVFs, this model could still work if there is collaboration from one or several surgeons that would perform GAVFs during time and space allocated to the nephrologist; this is a complex task although simpler than trying that a complete surgical department gets involved in archiving this goal.

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