

L'accesso venoso: fistola AV

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Background

- ✓ **Home treatment** is the cornerstone of hemophilia therapy
- ✓ A **stable and uncomplicated venous access** is essential in the management of children with hemophilia who may undergo
 - prophylaxis
 - immune tolerance induction treatment
 - on-demand by-passing therapy
- ✓ **Peripheral veins** remain the preferred choice, however an alternative venous access is often required especially at very young ages

Background

- **Central venous catheters** have been largely used in this setting, although infection and thrombosis strongly affect their duration
- Since 1999 **AVF** was considered as a suitable venous access for hemophilic children
- The choice of the venous access should take into account many factors pertaining both clinical conditions and family context

AVF

Pre-operative assessment

- ✓ Evaluate the real need according to age, peripheral veins and prescribed regimen
- ✓ The surgical site is identified by US Doppler
- ✓ Vessels caliber rather than body weight of the children is critical
- ✓ Preserve the chosen site by avoiding venipuncture until surgery

AVF

Surgery

- ✓ Surgical artero-venous shunt between the brachial artery and the cephalic or the basilic vein at the elbow crease
- ✓ Shunts involving the radial artery are more prone to patency loss/non maturation if the anastomosis is small
- ✓ Diameter of the anastomosis: 1-2 mm
- ✓ Requires 5 days of hospitalization due to the need for replacement therapy
- ✓ A drainage is put in place for 48-72 hours

AVF

Post-operative follow-up

- ✓ US Doppler monthly until AVF maturation
- ✓ First access as soon as the vein is large and evident at palpation for at least 1cm length
- ✓ US Doppler once a year if the blood flow remains stable (800-1000 ml/min)
- ✓ US Doppler every 3-6 months if the blood flow exceeds 1000 ml/min or if a rapid increase in blood flow is observed
- ✓ Ecocardiography once a year if negative; every 6 months in case of initial signs of cardiac overload

AVF management

- ✓ No need for aseptic techniques
- ✓ Accessed as a peripheral vein
- ✓ Usually several venous branches nearby the AVF become larger and easily accessible
- ✓ Schedule surgical elective dismantling as soon as peripheral veins are accessible
- ✓ Schedule surgical elective dismantling if signs of cardiac overload appears at Ecocardiography
- ✓ Schedule surgical dismantling/remodeling in case of aneurysmatic dilatation



43 AVF have been created between 1999 and 2008

5/38 patients underwent a 2nd procedure

- **Median follow-up after creation:** 7.0 yrs (3.0-8.8)

35 AVF (81%) achieved maturation

- **Median time to maturation:** 58 days (21-135)

Mature AVFs were used for a median of 5.0 yrs (0.4-8.5)

- Median n of accesses/month: 16 (9-48)
- Median n of total accesses per patient: 1052 (166-2036)

29 children (76%) used AVF according to the initial indication

- 10 for prophylaxis
- 19 for ITI

Of the remaining 6:

- 2 developed inhibitors after surgery and underwent ITI
- 1 had a transient inhibitor and started prophylaxis
- 3 were non-compliant to ITI regimens

Treatment regimen	Patients	Median number of accesses per patient (range)	Median duration of AVF use, yrs (range)
ITI*	21	1192 (166-2036)	5 (0.4-8.5)
Prophylaxis	11	602 (367-1537)	4 (2-8.5)

*All patients who completed ITI continued treatment through AVF either on regular prophylaxis or on demand.

Complications

	Procedures (n=43)	Children (n=38)
Inadequate maturation	4	3
Loss of patency	4	4
Limb hypertrophy	1	1
Aneurysms	4	4
Blood overflow	1	1
ALL	14 (32%)	13 (34%)

Until 2008

	Ports	AV Fistulae
Number	27 in 26 children	43 in 38 children
Median age at insertion/creation, yrs	4.5 (0.8-10.7)	2.7 (0.9-11.9)
Initial indication		
-ITI	10 (37%)	18 (42%)
-prophylaxis	17 (63%)	25 (58%)
Previous CVC removal	NA	11/38 (29%)
Long-term prophylaxis	11/17 (65%)	11/11 (100%)
- Median duration, yrs	6.1 (1.5-9.1)	4.0 (2.0-8.5)
ITI completion	5/10 (50%)	21/22 (95%)*
- Median duration, yrs	0.8 (0.5-1.7)	1.3 (0.5-4.3)

*Still ongoing in 3

Update

- Until now 75 interventions in 67 children
- Median age at surgery: 2.5 yrs (IQR: 1.8-3.5)
- Median body weight at surgery: 13.8 kg (IQR: 12-16)
- 59 children (88%) with hemophilia A
- 38 (57%) with inhibitors
- Median artery diameter: 1.5 mm (IQR: 1.1-2.0)
- Median vein diameter: 2.0 mm (IQR: 2.0-4.0)

Conclusions

- *AVF is a stable and safe venous access for children with hemophilia*
- *It can be used for either prophylaxis or ITI*
- *It may last up to 5 years without relevant complications*
- *Scheduled surgical dismantling is highly warranted as soon as peripheral veins become suitable for frequent venipuncture*