

AngioAccess Tours 2010

Aneurysm degeneration of the donor artery in vascular access: Potential risks and technical options.

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Arteriomegaly Aneurysmal Degeneration

ü **Arteriomegaly**: common

ü **Aneurysmal degeneration** (AD) of donor artery :

- long-standing post trauma AVF
- rarely reported in vascular access:

4 original cases + 7 reported in literature



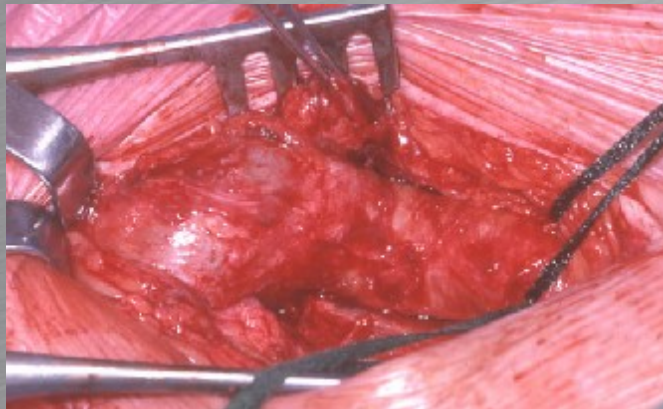
Post Traumatic AVF

Melliere D et al. *Ann Vasc Surg* 1997;11:391-6

ü 6 patients (post traumatic AVF) + 11 in literature

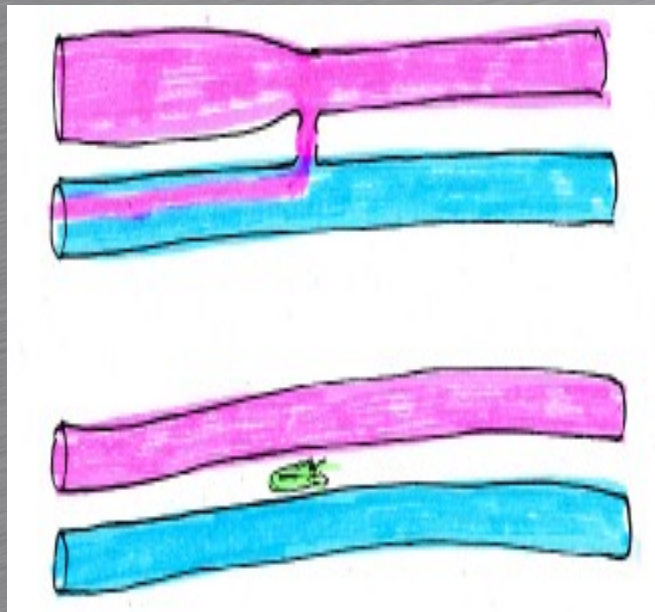
ü Delay AVF / closure: mean 20.7 years (7 - 23)

ü Delay closure / A.D.: mean 9.8 months (1- 18 years)

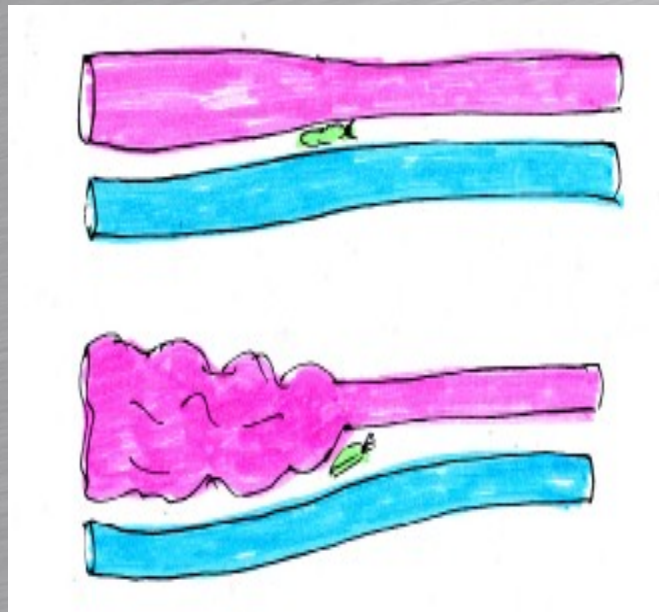


Three evolutions

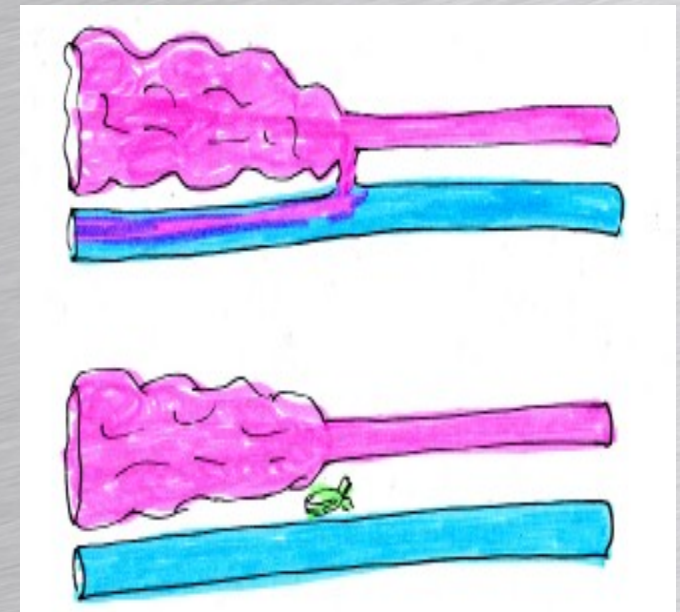
**Reversible
Arteriomegaly**



**Aneurysmal
degeneration
+/- 10 ys after
closure of AVF**



**Aneurysmal
degeneration
years after
access creation**



AD following congenital & acquired

Sako Y et al. *Surgery* 1970;67:40-61

Pathology similar to atherosclerotic aneurysms:

ü fragmentation of elastic tissue,

ü muscular atrophy,

ü increased fibrosis,

ü intimal thickening,

ü calcification in some areas



Patient #1

ü Left AVF (brachial to basilic) X 2 years, then AVB X
4 years -> transplant.

ü 9 years after closure: swelling -> A.D.

Thrombosis but no ischemia

ü Refused surgery



Patient #2

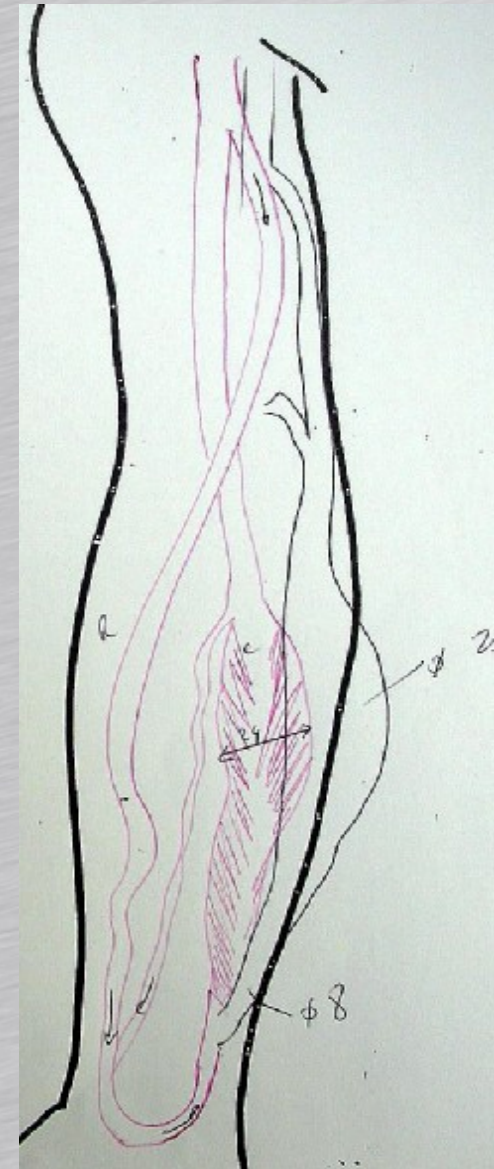
ü Right Ulnar art. to Basilic vein AVF

ü 4 years: AD (vein & artery) flow 2.4 l/min

Proximal ligation ulnar art. flow 0.65 l/min

ü 4 years: thrombosis of ulnar aneurysm

No treatment, no further complication



Patient #3

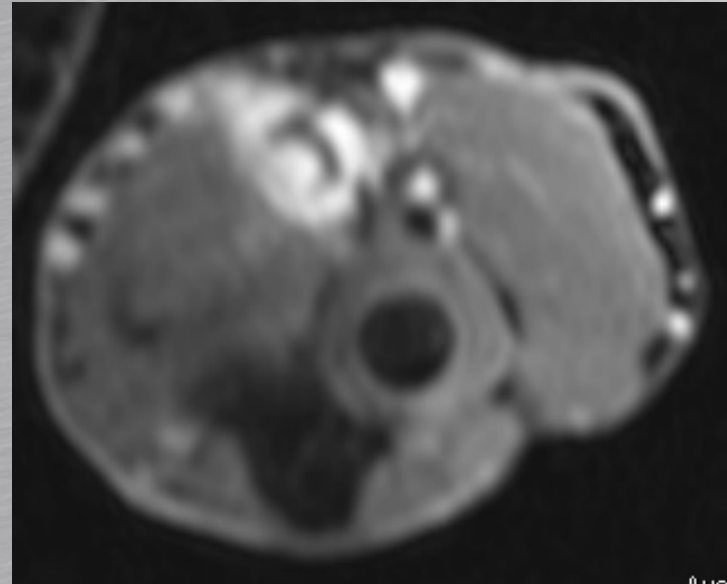
ü Brachio-cephalic AVF

ü 6 years: Ligation

ü 4 months: Subacute

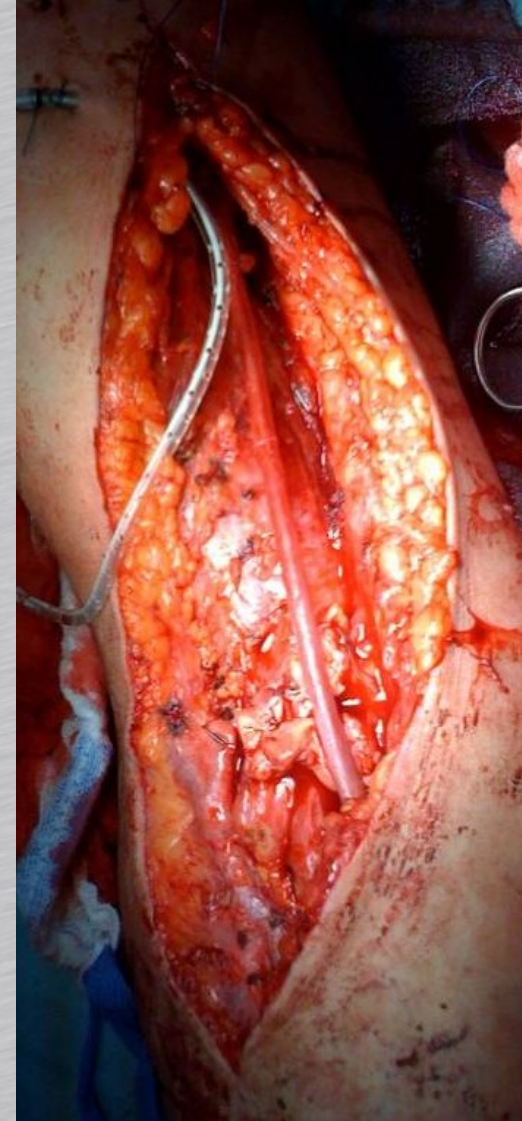
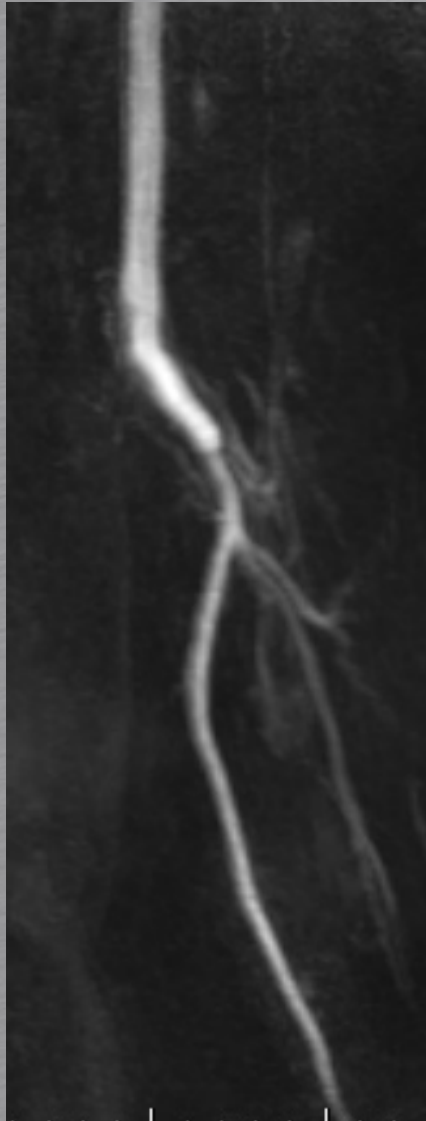
ischemia: occlusion radial

& interosseous art.



Patient #3

ü Saphenous vein BP -> ulnar art.



Patient #4

ü Left radio-cephalic AVF

ü High flow (2 L/min) at 9 years

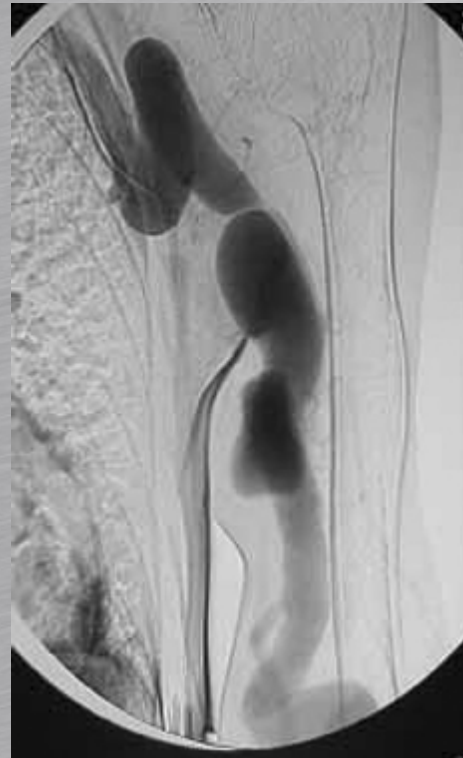
ü Proximal & distal ligation of radial artery

AVF still patent (0.18 l/min)

ü 2 years later: A.D. of brachial artery (15-28 mm Ø)



Patient #4



Patient #4



Patient #4

ü AVF used 3 more years, then failed

-> contralateral ulnar AVF

ü 2005: Transient swelling

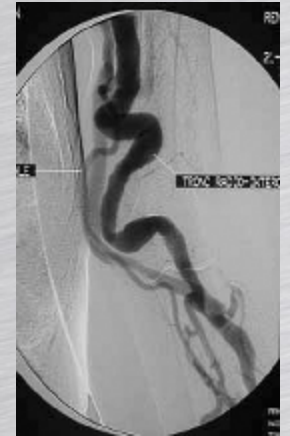
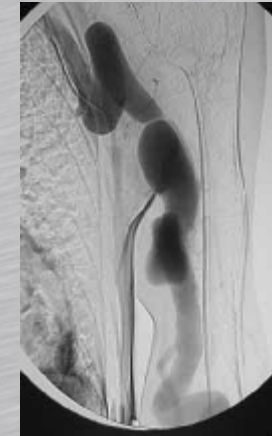
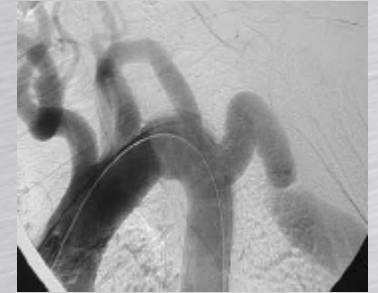
ü 2006: Brachial artery Ø 38 mm

ü 2009: Swelling Ø 80 mm



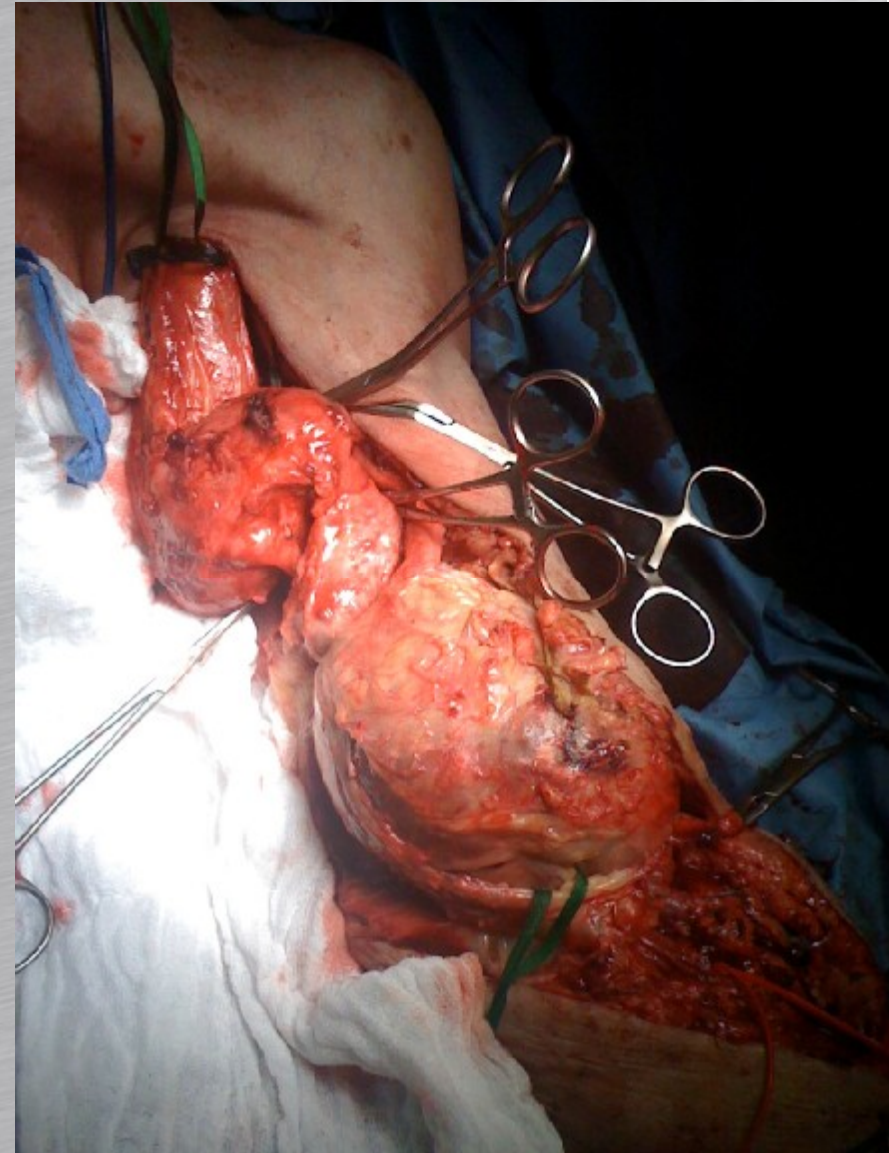
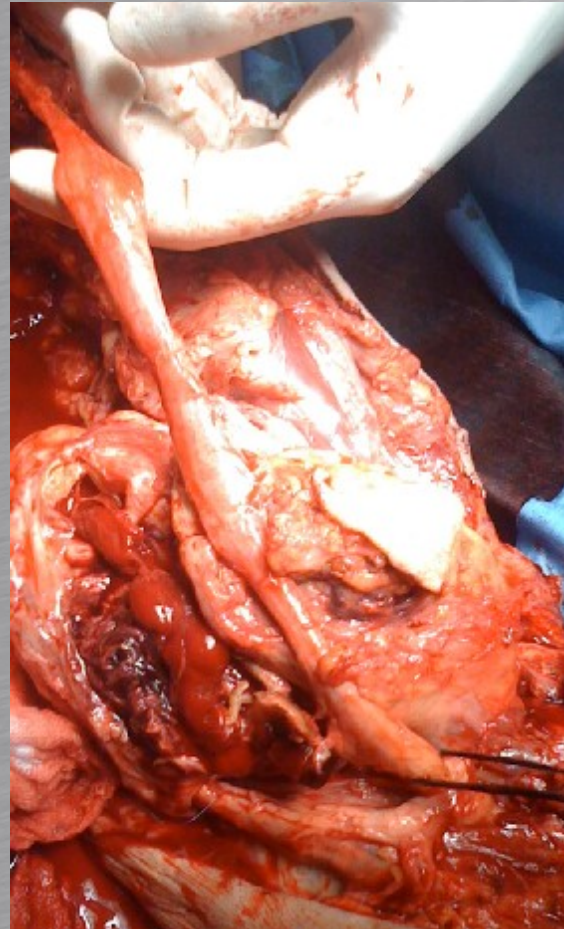
Patient #4: Options

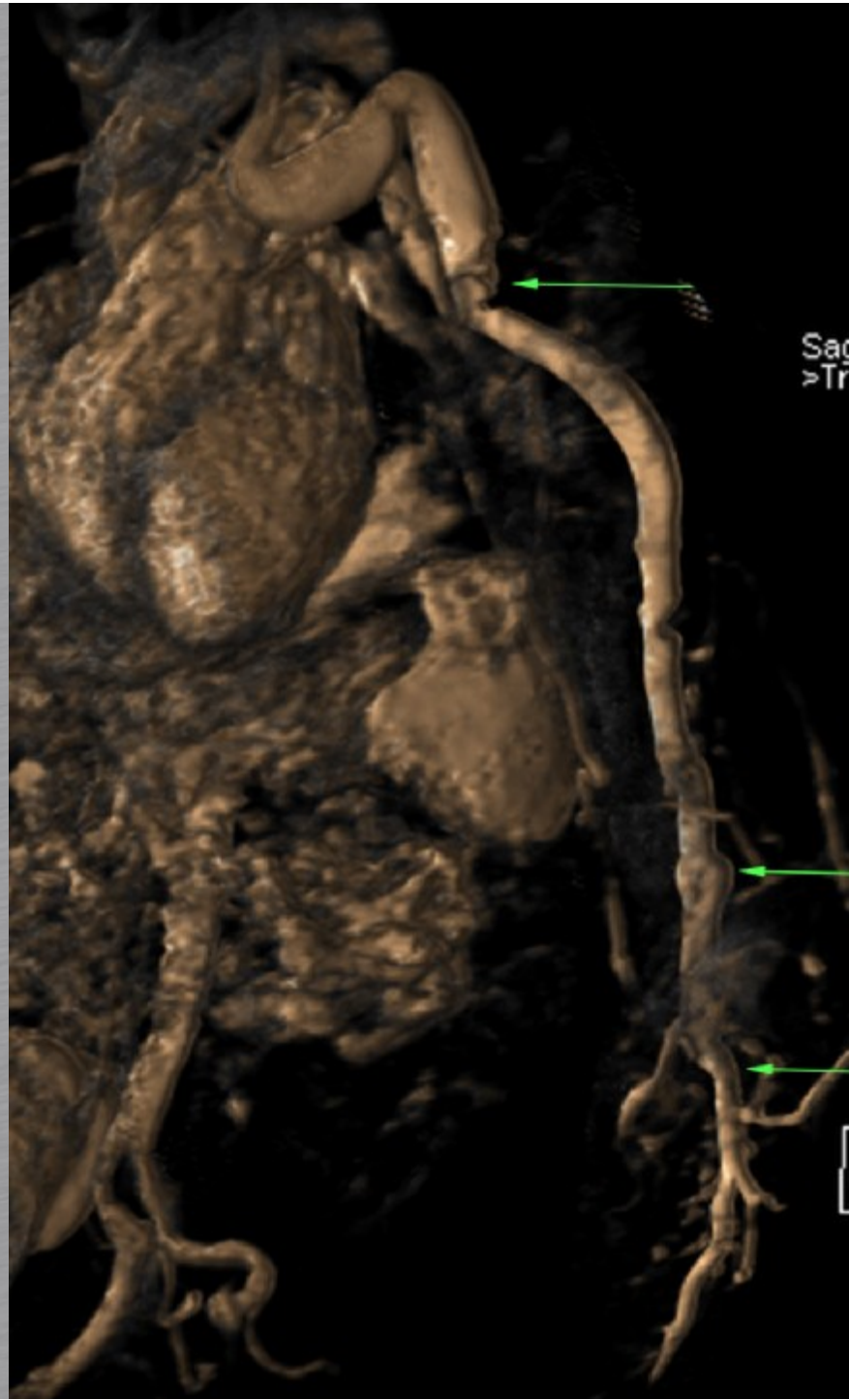
- ü Long saphenous vein bypass
- ü A.D. resection + anastomosis
- ü Multiple short (prosthetic) bypasses, preserving segments of subnormal artery (enlarged without A.D.)



Patient #4: Intervention

üBasilic vein





Patient #4: Postop.



Literature

Ref.	Hale	Nguyen	Schunn	Eugster	Battaglia	Sultana
Number of patients	1	1	1	2	1	1
Sex	M	M	F	N/A	M	M
Age	35	51	52	N/A	58	57
Comorbidities	hypertension	N/A	hypertension diabetes tobacco	N/A	hypertension diabetes tobacco	N/A
Location of AVF	Brachio cephalic	Radio cephalic	Radio cephalic	N/A	Radio cephalic then proximal AVB	Brachio cephalic
Duration of AVF (years)	7	16	2	10.5 / 6	13	10
Time of Aneurysm Diagnosis (years)	3	8	19	0 / 7	13	16
Aneurysm	axillary- brachial	axillary- brachial	brachial	brachial	axillary- brachial	brachial



Literature

Hale PC *Eur J Vasc Surg* 1994 ; 8 : 101-103

Nguyen DQ *Eur J Vasc Endovasc Surg* 2001;22(4):381-2

Schunn CD *Vasc Med* 2002;7(1):25-7

Eugster, T *J Vasc Surg* 2003 ;37 (3): 564-567

Battaglia L *Ann Vasc Surg* 2006;20(4):533-5

Sultana L *J Cardiovasc Surg* 2007;48(4):197-9

Ref.	Hale	Nguyen	Schunn	Eugster	Battaglia	Sultana
Location of Aneurysm	axillary-brachial	axillary-brachial	brachial	brachial	axillary-brachial	brachial
Complication of aneurysm	radial & ulnar emboli	paresthesia digital emboli	thrombosis contained rupture	distal emboli	no	distal emboli
Bypass	saphenous vein	saphenous vein	forearm vein	saphenous vein	PTFE	saphenous vein



Conclusion #1

Some **arteriomegalies** may decrease (Rich) but...

ü ? frequency ?

ü ? complications ?

ü ? criteria of reversibility ?

... **AVF closure** : ALWAYS

AD may occur before or long-time after closure



Conclusion #2

? SURGERY ?

ü rupture (but no case reported) : YES

ü digital emboli : YES

ü diseased fore-arm arteries: ?

ü local (smooth) thrombosis w/o emboli: ???



Conclusion #3

? BYPASS ?

ü Saphenous vein

ü ? Upper limb vein ?

ü PTFE

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