CONTROVERSES ET ACTUALITÉS EN CHIRURGIE VASCULAIRE
CONTROVERSIES & UPDATES IN VASCULAR SURGERY
JANUARY 21-23 2016
MARRIOTT RIVE GAUCHE & CONFERENCE CENTER
PARIS, FRANCE

Should we re-intervene after failure of forearm wrist AVF?

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Disclosure

Speaker name: **Surendra Shenoy M.D., Ph..D.**

I have the following potential conflicts of interest to report:

Consulting

Employment in industry

Shareholder in a healthcare company

Owner of a healthcare company

Other(s)

XX I do not have any potential conflict of interest for this presentation

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Background

Forearm AVF

'an ideal vascular access'

Advantages of autologous tissue

- Better long term patency
- Lower risk of thrombosis
- Lower risk of infection

Advantage of forearm location

- Multiple outflows
- Lower number of interventions
- Low risk of high flow complications
- Low risk of steal
- Options for secondary AVF

'Fistula at no other site has similar longevity'

Definite need to increase the prevalence of FA AVF

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Background

Patient with functioning FA AVF enjoy the benefit of getting adequate dialysis that is associated with improved longevity

What is the problem?

Forearm to upper arm ratio	**32 - 80%**
Reported early failure	**0.3 – 26%**
Wide range failure to mature	**3 – 37%**

Effect of poor understanding of creation/maturation on planning, execution of plan and trouble shooting

Ohira S et.el. HDI 06; 10: 173
Wilmink T et.al. Eu J Vasc Endo Vasc 2016;51: 134
Buickians A et.al. JVS 2008; 47: 415

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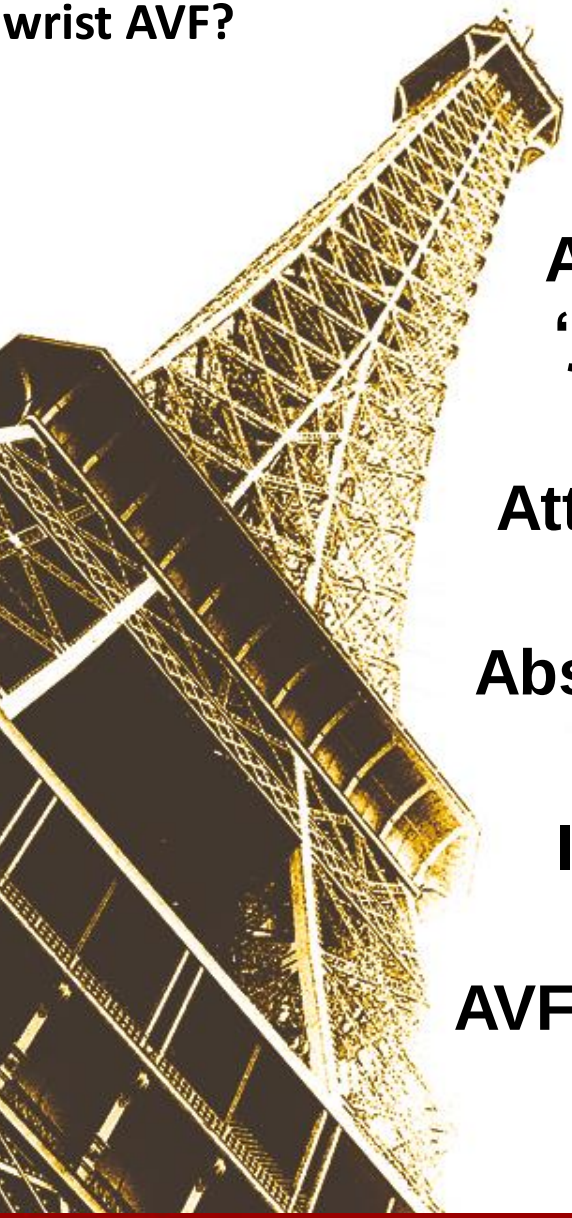

Background

Non maturation

Attempts to increase AVF ‘joining vein to an artery’

↓

Attempts to salvage failing AVF

↓

Absurd increase in salvage procedures

↓

Increasing catheter dependence

↓

AVF really superior or AVG to start HD?

DeSilva RN et.eal. JASN 2013;
Lacson E, et.al. AJKD 2007;50:379-95

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Results of early intervention

Reports of fistula maturation following early intervention

Thrombectomy | **Stenosis dilation** | **Forceful vein dilation**

Mostly single center, cohort experience

Lots of experience in interventional literature

Successful but small reports in surgical literature

⬇ patency	⬆ need for interventions

It works !

When? Where?

Why? How?

Beathard GA et.al. Am J Kid Dis 1999; 33:910
Clark TWI et.al. Radiol 2007; 242: 286
Miller GA et.el. J Vasc Acc 2009; 10: 183

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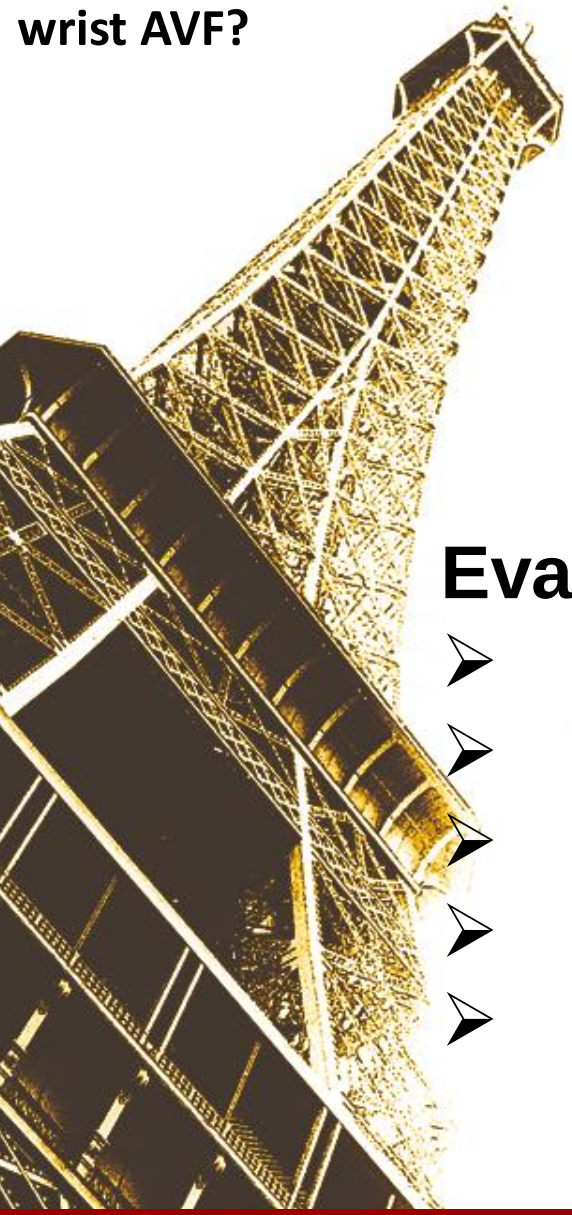

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Presentation Objective

Evaluate & learn from current experience

- **Access maturation**
- **Failure mode**
- **Available treatment modalities**
- **Outcome**
- **Tailoring the treatment**

Physiology of AVF maturation

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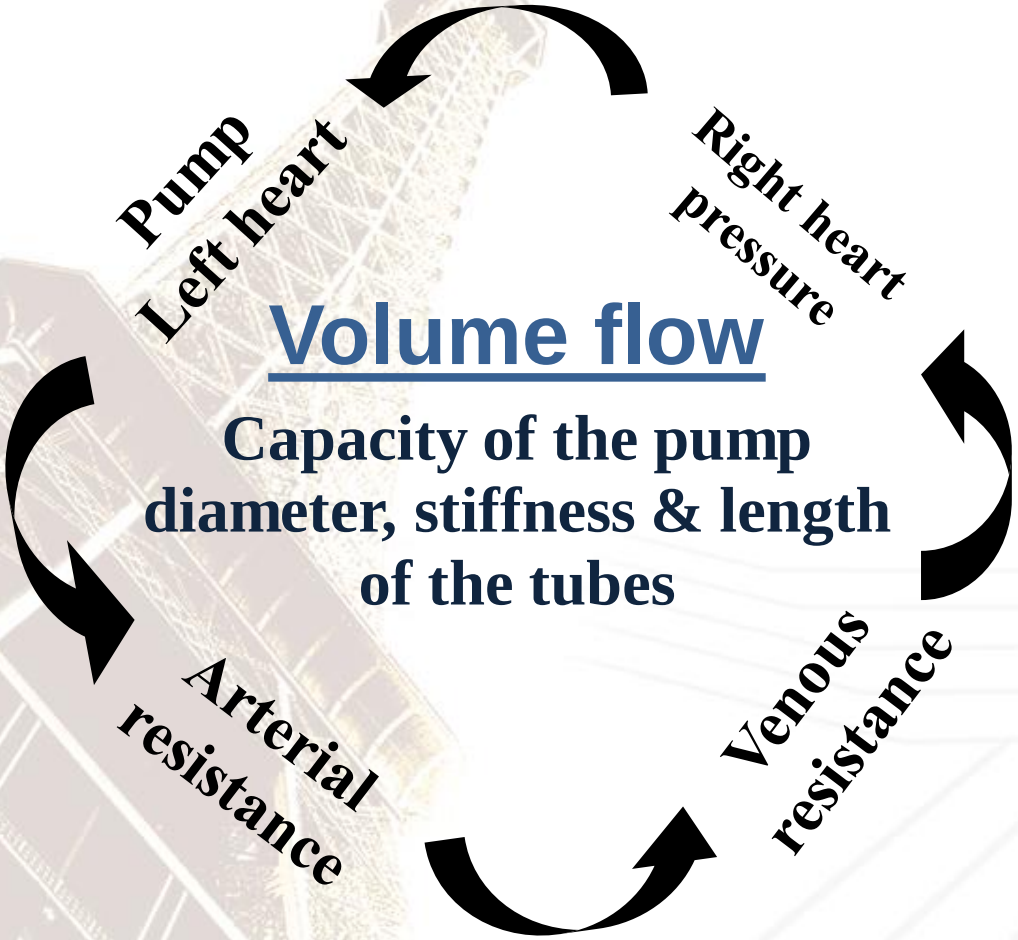

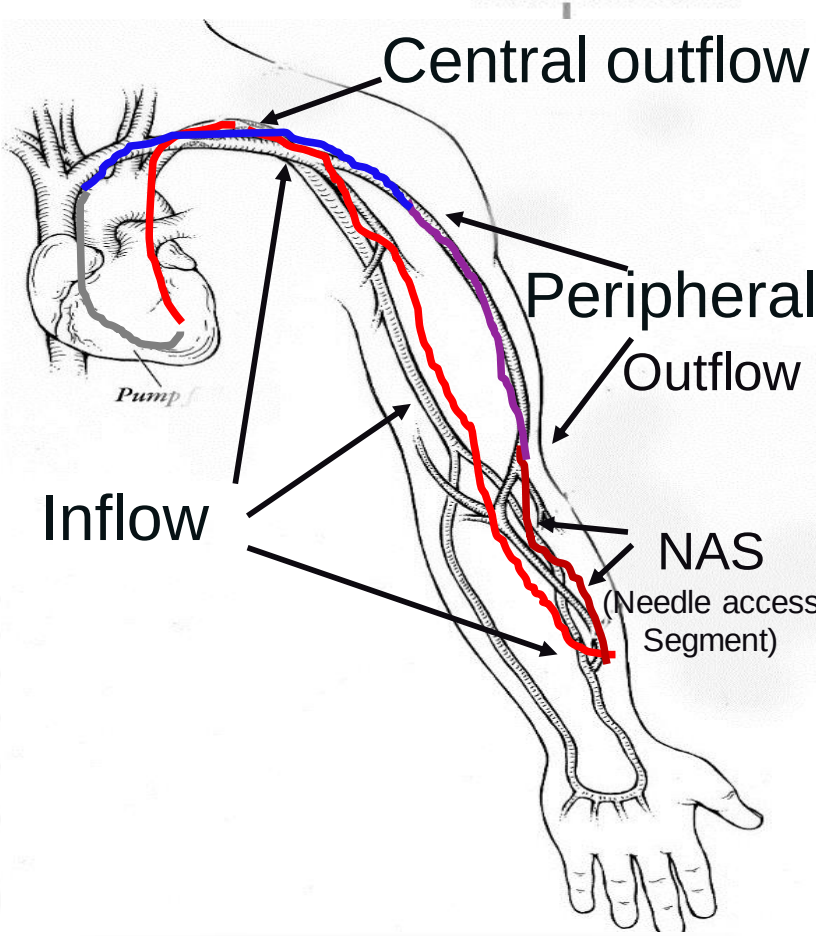

Anatomic configuration and resultant flow pattern related injury dictates the short term and long term AVF function

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Hypothesis

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Acute increase in the volume flow caused by AV communication creates flow related 'stress zones' in the access circuit. Stress that exceeds 'physiological threshold' results in 'injury response'. Anatomic configuration and flow modulation can alter the stress.

……. S. Shenoy

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Failure modes of AVF

Early failure

- Thrombosis
- Patent (not usable)
  - Deep veins
  - Branched veins
  - High flow
  - Circuit stenosis
    - High pressure
    - Low flow

Late failure

- Thrombosis
- Circuit stenosis
- NAS ulcers
- NAS aneurysm
- Infections
- Flow problems
  - High flow
  - Low flow

'STENOSIS'

Clinical exam with CDDUS

Management of early thrombosis FAVF

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Clinical exam
US evaluation

→ **Stenosis type/site**
Clot burden/duration

No surgical issues
Good inflow
Good outflow

→ **Intervention**
Institutional preference

→ **Surgical**
Borderline vessels
JAS with good outflow

→ **Interventional**
Large vessels with multiple stenosis

Extended criteria
Poor inflow
Poor outflow

→ **Precious access**
Consider salvage

→ **Other options + +**
Abandon access

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Early failure

‘patent non mature’

management

Pulsatility

- outflow

Conduit

- deep
- branched

Blood flow

Low = inflow

High flow

?symptoms

Image guided intervention

- Angioplasty
  - Thrombectomy
  - Stent
- Flow reduction
  - Tributary occlusion

Surgical intervention

- Thrombectomy
- Patch angioplasty
- Segment replacement
- Inflow/outflow relocation
- Flow reduction
  - Tributary ligation
  - Distal flow enhancement (DRIL, RUDI, PAI)
  - Vein enhancement superficialization

Physical exam & US brachial artery flow and peripheral vein evaluation

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Management of non-maturation

1st post op visit 10-14 days

Clinical evaluation

US if problems identified

No problem

2nd visit 3-5 weeks

Clinic exam

US evaluation

Mature

Ready

Flow >500-600ml/min
Diameter 6mm, length 10cm
Depth <5mm

Close to mature

No problem

Wait 2-3 weeks

Detectable problem

Observation
Surgery
Angioplasty

Detect problem

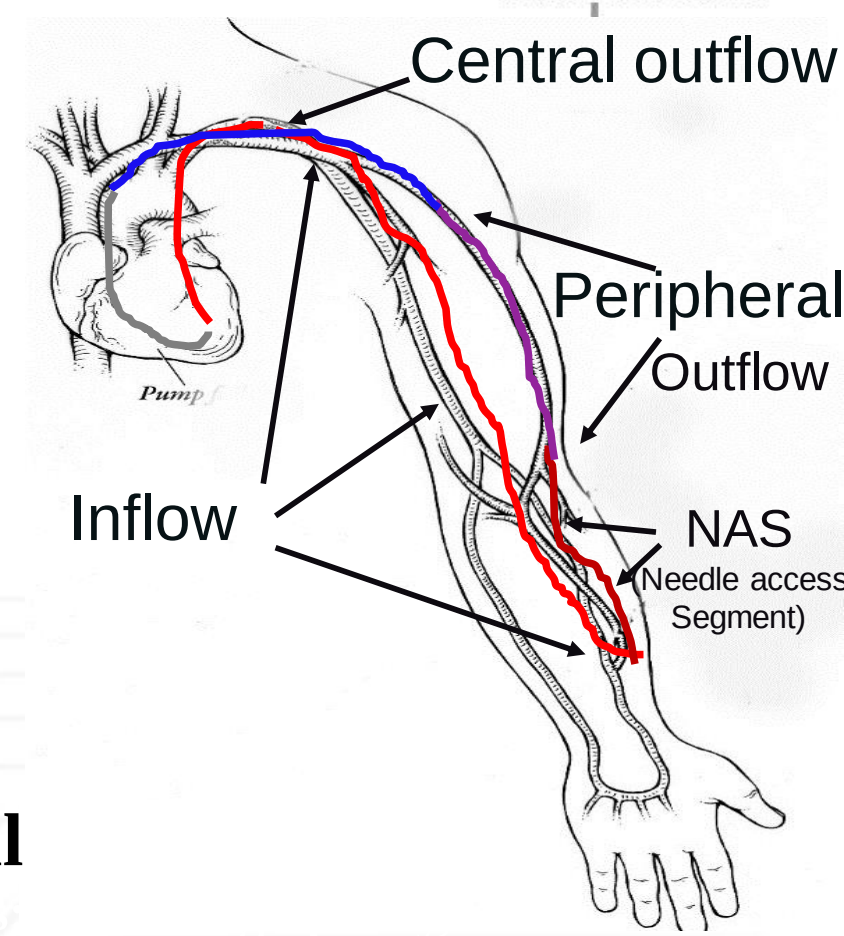
Good flow deep vein: superficialize
Good flow branched vein: enhance

Surgery
Angioplasty
BAM

Thrombectomy
Patch angioplasty
Flow relocation
Segment replacement
Enhancement
Superficialization
Valvotomy

Management of late failures

Any FA AVF that has been functioning well for an extended period of time is worth salvage
Ulcers, aneurysms, infections, transplant, high flows do not necessitate fistula closure



Principles

Identify cause of problem
Mostly stenotic

Interventional
Mostly angioplasty

Surgical

No indication for stent is a FA fistula

SUMMARY

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Goal of access to provide longest lasting access needing least interventions without jeopardizing future access options in a reasonable period of time

Functioning forearm AVF is the closest to 'ideal access'

It is worth attempting to salvage failing forearm access

'A protocol based approach to evaluate the failure mode, plan the corrective action and maintaining the followup data would help improve our knowledge to make recommendations as to when and where to apply the available management tools in the most productive manner'

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