

CONTROVERSES ET ACTUALITÉS EN CHIRURGIE VASCULAIRE  
CONTROVERSIES & UPDATES IN VASCULAR SURGERY

**JANUARY 19-21 2017**

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**PARIS, FRANCE**



# Endovascular AVF creation:

## The Oracle predictions





## Disclosure

Speaker name: **Miltos Lazarides, Univ. of Cyprus**

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- 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)
- I do not have any potential conflict of interest



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ORIGINAL ARTICLE ARCHIVE

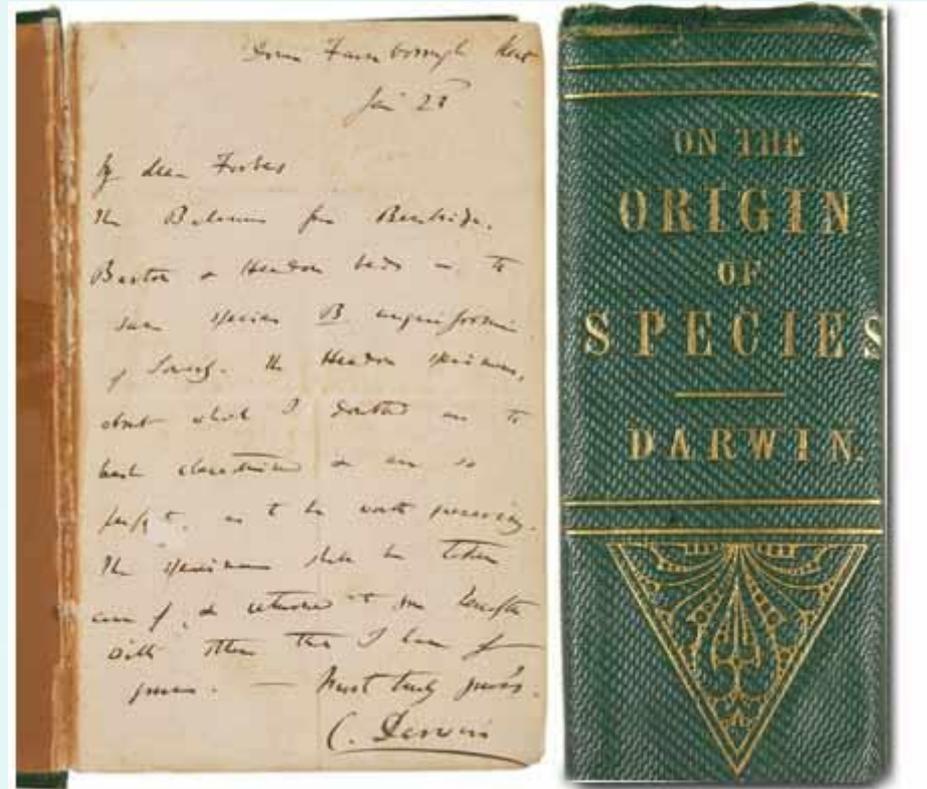
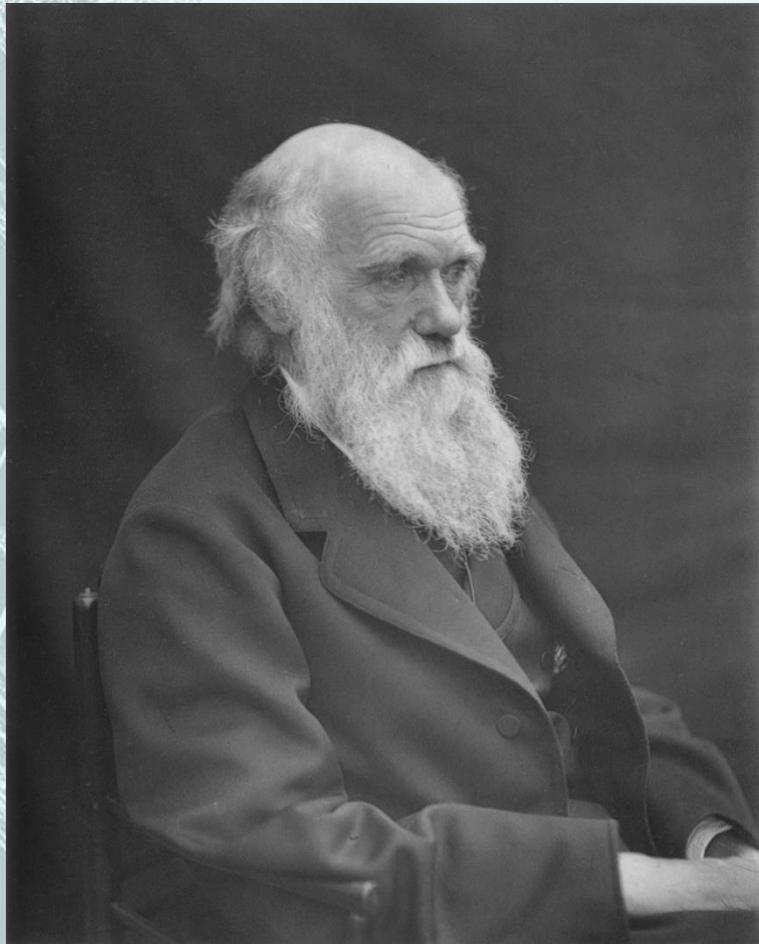
## Chronic Hemodialysis Using Venipuncture and a Surgically Created Arteriovenous Fistula

Michael J. Brescia, M.D.<sup>†</sup>, James E. Cimino, M.D.<sup>‡</sup>, Kenneth Appel, M.D.<sup>§</sup>, and Baruch J. Hurwich, M.D.  
N Engl J Med 1966; 275:1089-1092 | [November 17, 1966](#) | DOI: 10.1056/NEJM196611172752002





# Charles Darwin (1808-1896)



# Have access surgeons to change or risk becoming extinct?

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# The era of “minimal invasive” interventions

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# Predicted percentage of vascular lesions that will be treated endovascularly by 2026



Lesion	Percentage
AAAs	90-95
Ruptured AAAs	90-95
Carotid stenosis	75-85
Aortoiliac occlusive disease	90-95
Supra-aortic trunks	90-95
Thoracic and thoracoabdominal aneurysms	85-90
Renal artery stenosis	85-90
Visceral artery occlusive disease	85-90
Infrainguinal arterial occlusive disease	75-90
Traumatic vascular lesions	75-90
Venous occlusive lesions	80-90
Overall	75-95

*Veith FJ, J Vasc Surg 2016*





# Lesions currently best treated by open surgery

Thoracic outlet and entrapments

Some ascending aorta and arch lesions

A few unusual aneurysms

Some Takayasu lesions

Some congenital, genetic aortic, and renal artery lesions

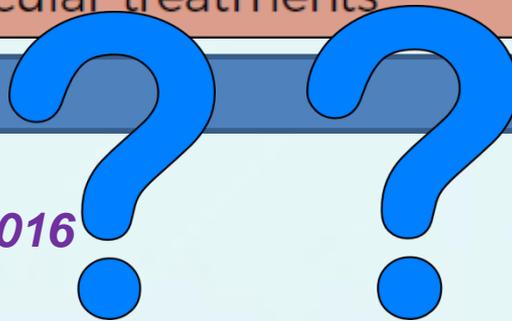
Some infected arteries and grafts

Some recurrent or complex lower extremity lesions

Some carotid lesions

Some failed endovascular treatments

**AV Fistula creation**



*Veith FJ, J Vasc Surg 2016*



# Update on Percutaneous AV Fistula Creation

Drs. Jeffrey E. Hull and Dheeraj K. Rajan discuss technical concepts and ongoing research in this emerging option for hemodialysis access.



**Jeffrey E. Hull, MD**

*Radiology Associates of Richmond  
Director of Richmond Vascular Center  
North Chesterfield, Virginia  
Dr. Hull has disclosed that he is Founder of  
and stockholder in Avenu Medical.*



**Dheeraj K. Rajan, MD**

*Head and Associate Professor  
Division of Vascular & Interventional  
Radiology  
Department of Medical Imaging  
University of Toronto, Toronto, Canada  
Dr. Rajan has disclosed that he is a paid  
consultant and shareholder to TVA Medical.*

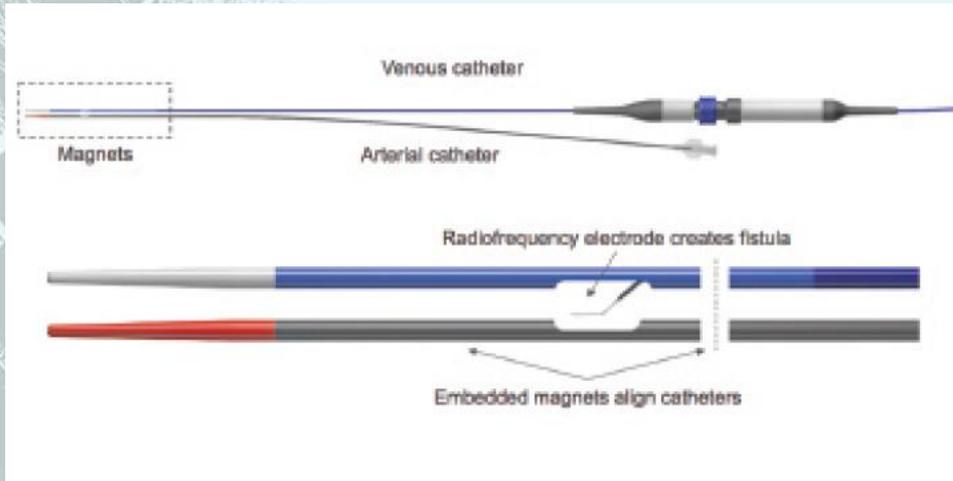
sure with fewer interventions. We are further evaluating if fistulas created using our minimally invasive technique result in a more reproducible access with improved clinical outcomes. This may translate into better quality of life for patients and may potentially reduce hemodialysis access maintenance costs.

**Dr. Hull:** In the United States and around the world, there is a shortage of dedicated access surgeons to create AV fistulas. The Ellipsys system (Avenu Medical) could increase the number and types of physicians capable of creating reliable fistulas to include endovascular surgeons, interventional radiologists, and interventional nephrologists. In addition to this, important goals are to improve patient care by creating and maturing fistulas quickly to reduce the time from request for fistula to usable access for dialysis, thereby reducing morbidity associated with temporary catheter access.





# Endovascular AV Fistula



**EVERLINQ SYSTEM**

**ELLIPSYS SYSTEM**



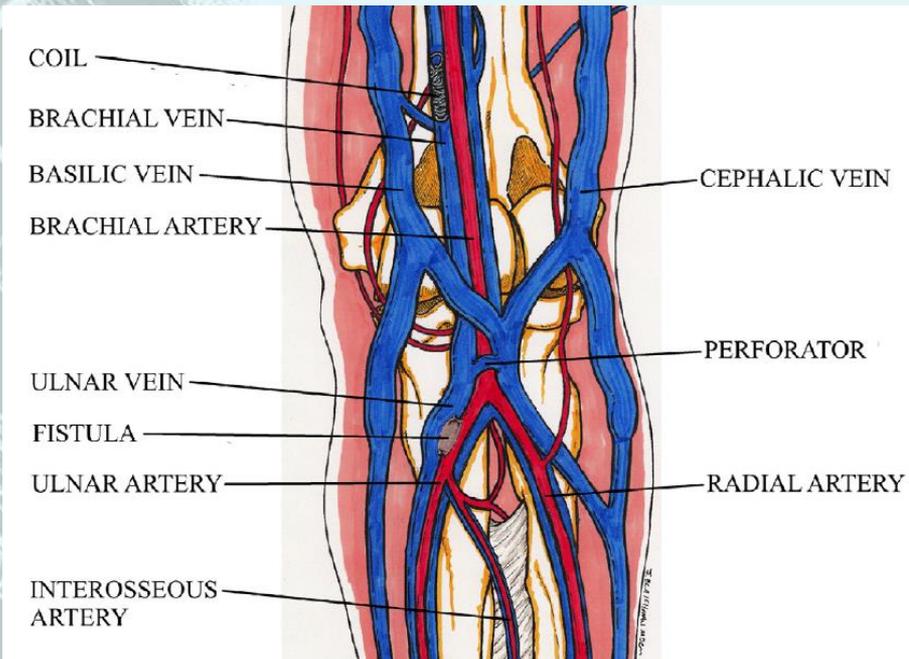
# Percutaneous Creation of an Arteriovenous Fistula for Hemodialysis Access

Dheeraj K. Rajan, MD, Adrian Ebner, MD, Sudhen B. Desai, MD,  
Jesus M. Rios, and William E. Cohn, MD

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**n=33**

**Technical success=97%**

**Maturation rate=96%**

**6mo patency rate=96%**

*J Vasc Interv Radiol 2015*





# Novel Endovascular Access Trial (NEAT)

NEAT trial shows six times fewer post-creation interventions with endovascular than with traditional surgical arteriovenous fistulae

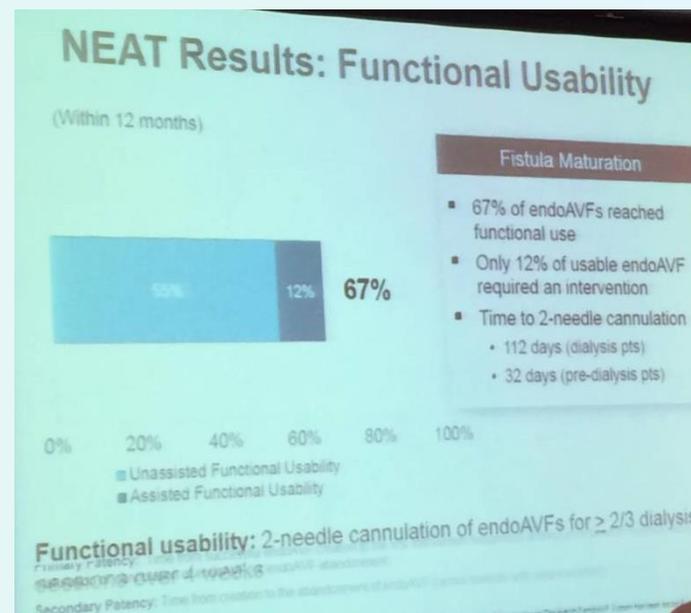
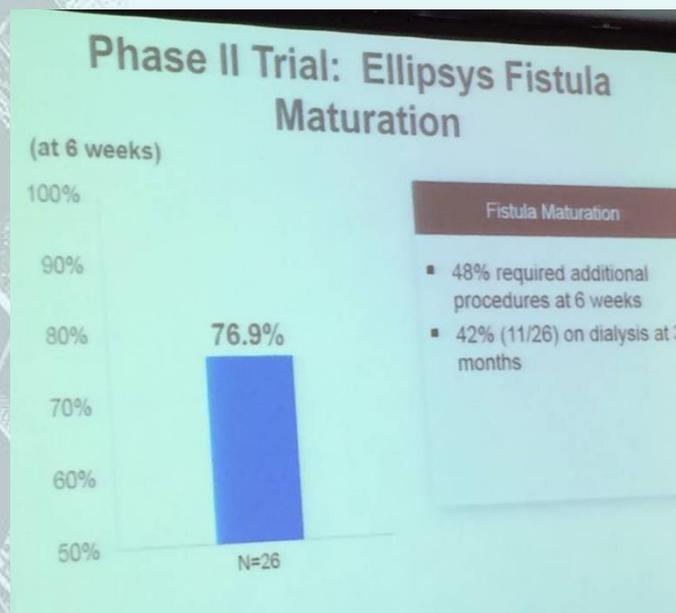
13th October 2016  95



- **n=80**
- **Technical success=99%**
- **At 4 weeks, the rate of thrombosis was 3.75%**



# Accumulating data, the results are coming down to earth

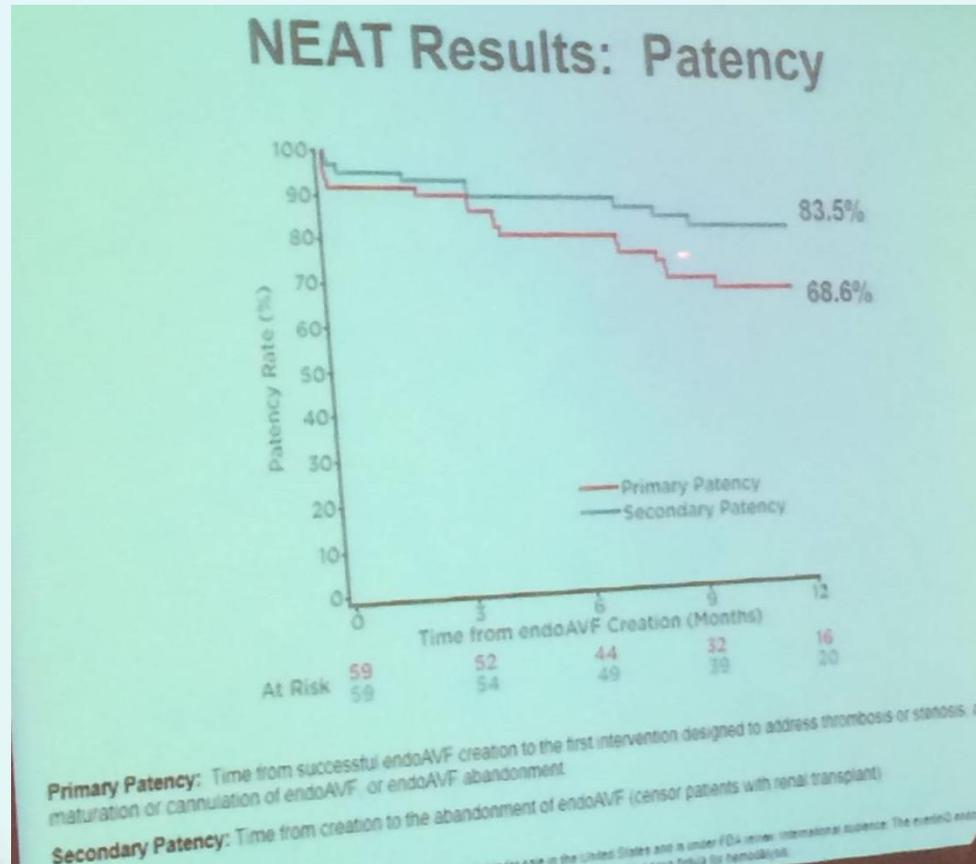


*Taken from a recent presentation of Marc Glickman*





# Accumulating data, the results are coming down to earth

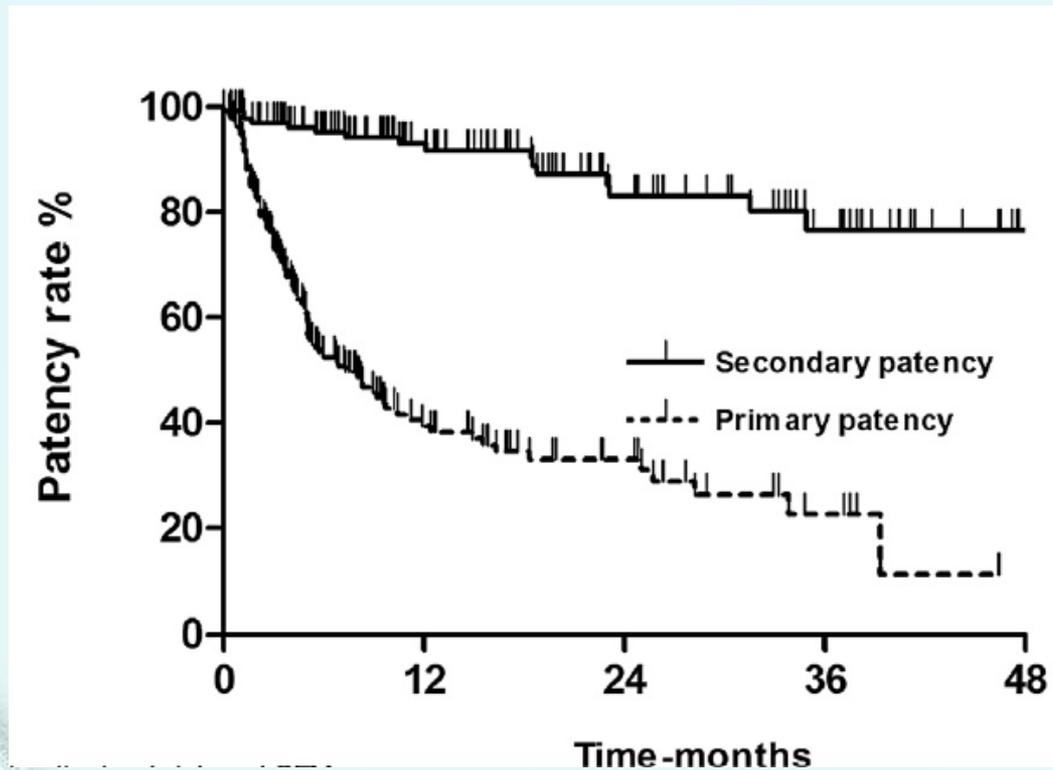


*Taken from a recent presentation of Marc Glickman*





# Patency of surgically created AVFs



*Olsha O et al, J Vasc Surg 2015*



# The prerequisites of a successful innovation





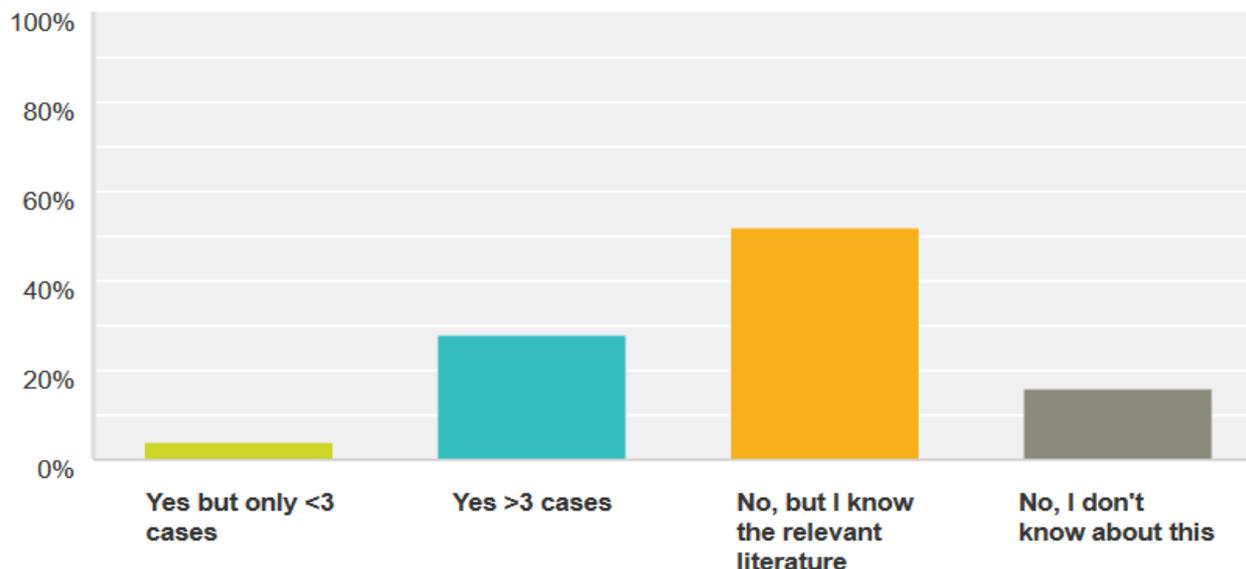
# What is the view of experts?

**65 members of the EB of J Vasc Access  
were contacted by e-mail (using the  
software SURVEYMONKEY<sup>®</sup>)**





# Do you have personal experience in creating/maintaining an endovascular AVF?

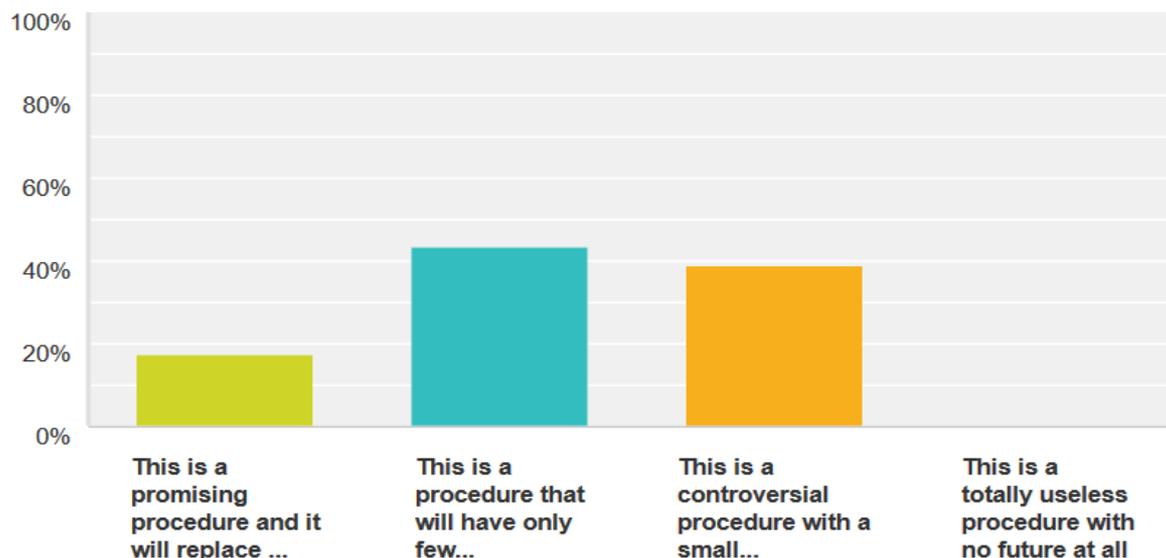


Answer Choices	Responses
Yes but only <3 cases	4.00% 1
Yes >3 cases	28.00% 7
No, but I know the relevant literature	52.00% 13
No, I don't know about this	16.00% 4
Total	25





# What is your view about the endovascular AV Fistula creation?



Answer Choices	Responses
▼ This is a promising procedure and it will replace in the future the open surgical AV Fistula	17.39% 4
▼ This is a procedure that will have only few indications and will partially replace the open AV Fistula	43.48% 10
▼ This is a controversial procedure with a small possibility to replace in the future the open surgical AV Fistula	39.13% 9
▼ This is a totally useless procedure with no future at all	0.00% 0
Total	23

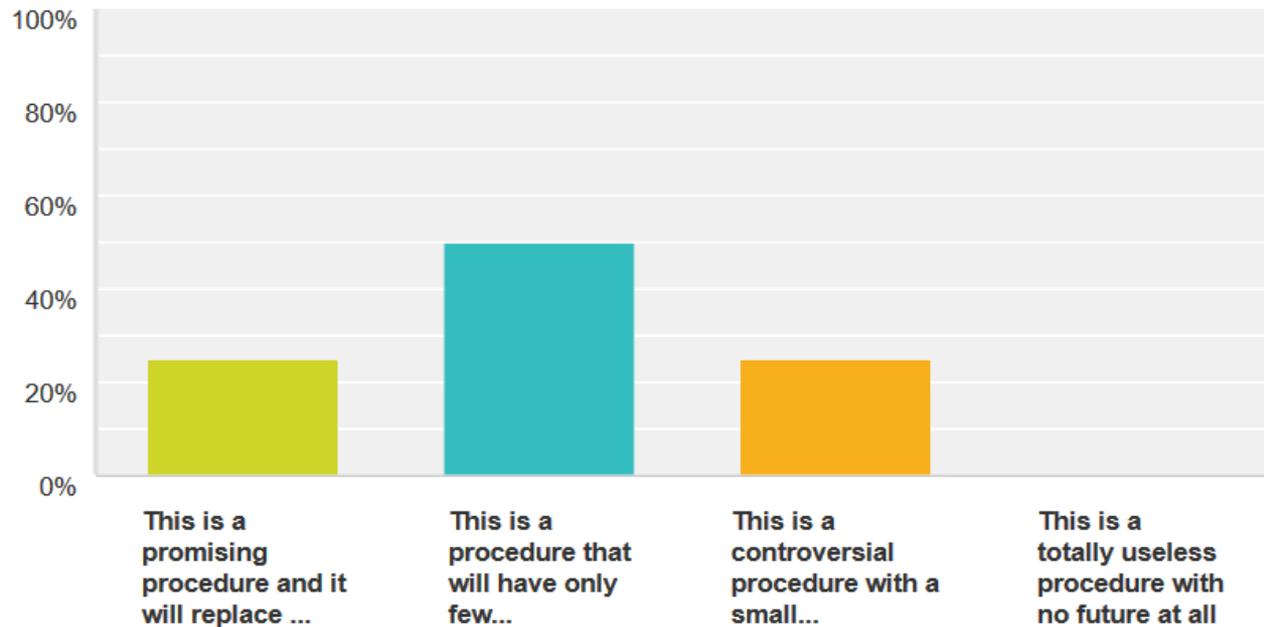




# The view of those having **personal experience** with endo-AVF

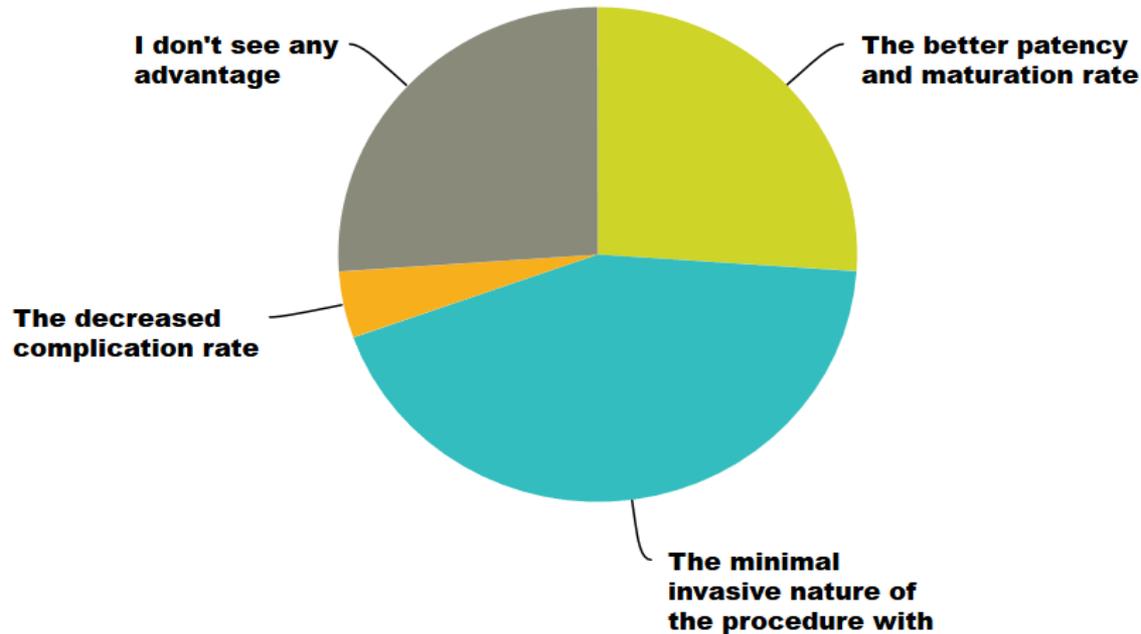
## What is your view about the endovascular AV Fistula creation?

Answered: 8 Skipped: 0





# What will be in your view the main advantage of the endovascular AV Fistula?

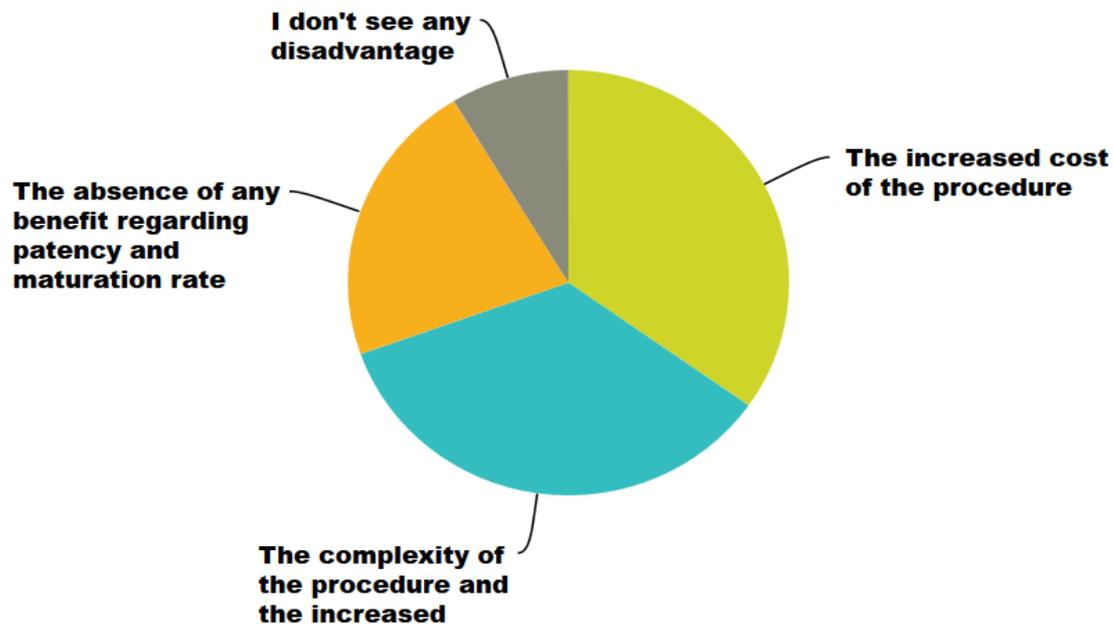


Answer Choices	Responses
▼ The better patency and maturation rate	26.09% 6
▼ The minimal invasive nature of the procedure with no incisions and scars	43.48% 10
▼ The decreased complication rate	4.35% 1
▼ I don't see any advantage	26.09% 6
Total	23





# What will be in your view the main disadvantage of the endovascular AVF?

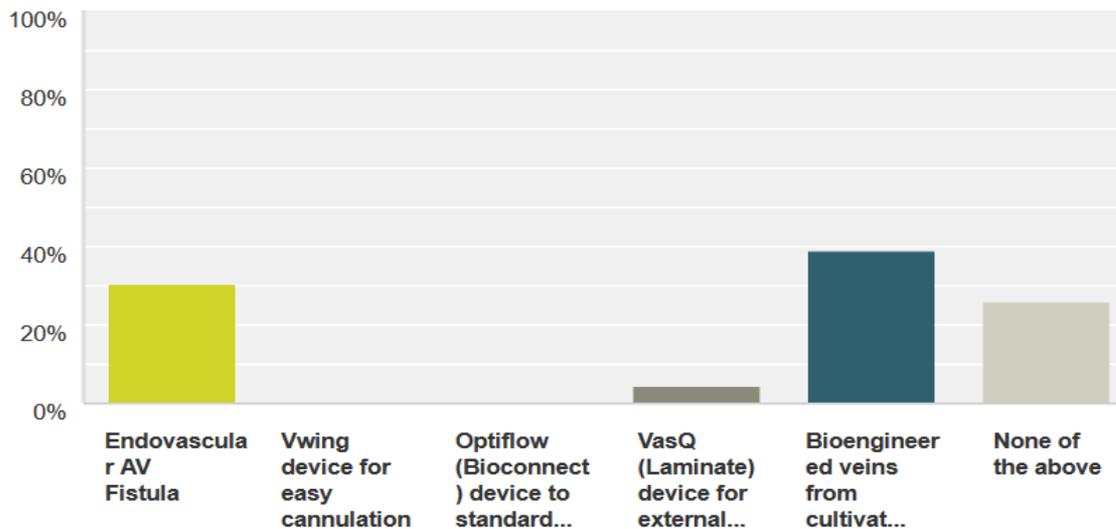


Answer Choices	Responses
▼ The increased cost of the procedure	34.78% 8
▼ The complexity of the procedure and the increased learning curve needed	34.78% 8
▼ The absence of any benefit regarding patency and maturation rate	21.74% 5
▼ I don't see any disadvantage	8.70% 2
Total	23





# What is in your view the most promising new innovation in access surgery?

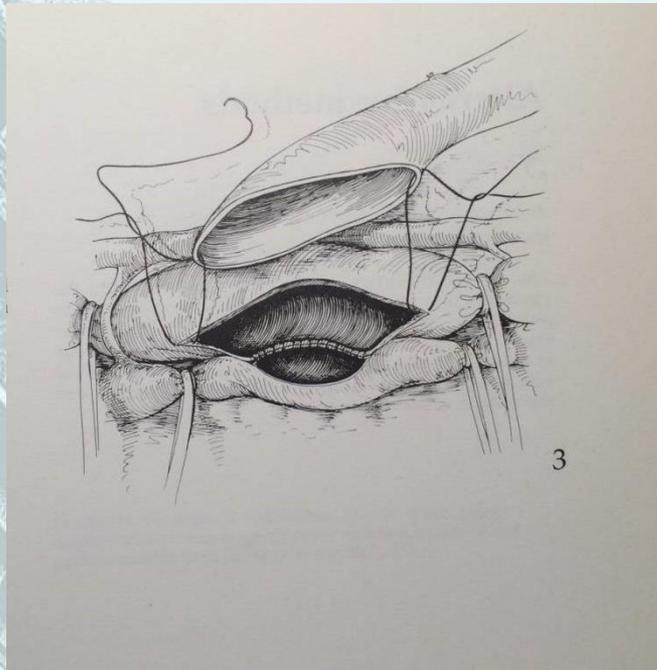


Answer Choices	Responses
▼ Endovascular AV Fistula	30.43% 7
▼ Vwing device for easy cannulation	0.00% 0
▼ Optiflow (Bioconnect) device to standardize the surgical AVF anastomosis	0.00% 0
▼ VasQ (Laminate) device for external support of the anastomosis	4.35% 1
▼ Bioengineered veins from cultivated human cells	39.13% 9
▼ None of the above	26.09% 6
Total	23





# Adjuvant AV fistula at the distal anastomosis of a fem-pop bypass graft



# If you have a hammer everything looks like a nail

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# Conclusions:

- Endovascular AV Fistulas will not replace the surgically created AVFs
- Endovascular AV Fistulas are here to stay and they will have indication in subgroups of ESRD patients
- Endovascular AV Fistulas will find application and in other areas of vascular surgery





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