

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

#### JANUARY 25-27 2018 MARRIOTT RIVE GAUCHE & CONFERENCE CENTER

PARIS, FRANCE WWW.CACVS.ORG



G Pratesi, MD

Vascular Surgery University of Rome "Tor Vergata"

#### Disclosure

Giovanni Pratesi, M.D.

I have the following potential conflicts of interest to report:

- ✓ Consulting: Abbott, Bolton, Cook, Cordis, Medtronic, WL Gore
- ☐ Employment in industry
- ☐ Stockholder of a healthcare company
- ☐ Owner of a healthcare company
- $\square$  Other(s)
- ☐ I do not have any potential conflict of interest



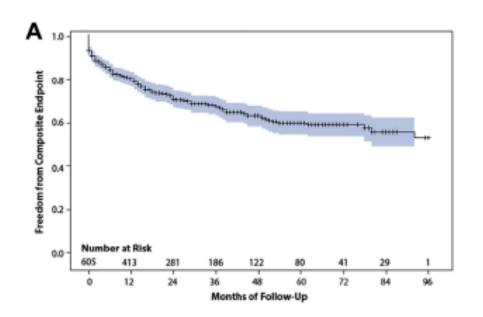
### fEVAR for infra diaphragmatic aortic aneurysms





# Twelve-year results of fenestrated endografts for juxtarenal and group IV thoracoabdominal aneurysms

	Year	No.	Perioperative SCI, No.	Mortality	
First author				30-day, No.	1-year, No.
Grimme <sup>22</sup>	2014	138		2	13
Amiotl <sup>21</sup>	2009	134	1	3	15
BSET <sup>16</sup>	2012	318	5	13	
Greenberg CCF JR	2010	227		4	
Greenberg (U.S. Trial) <sup>18</sup>	2009	30	0	0	2
Donas <sup>17</sup>	2012	29		0	
Kristmundsson <sup>20</sup>	2009	54	0	2	12
Manning <sup>15</sup>	2011	20		2	
Mertens <sup>14</sup>	2012	2		0	
Scurr <sup>13</sup>	2007	45	0	2	5
Semmens <sup>12</sup>	2006	58	i	2	8
Tambyraja <sup>19</sup>	2011	29	4	0	4
Verhoeven <sup>4</sup>	2010	100	23	1	



The use of fenestrated devices to treat juxtarenal and group IV TAAA is safe and effective in long-term follow-up. Mortality in this patient population is largely not aortic-related

Mastracci T et al, J Vasc Surg 2015



#### **ARTICLE IN PRESS**

Eur J Vasc Endovasc Surg (2018) ■, 1-7

#### A Study of the Cost-effectiveness of Fenestrated/branched EVAR Compared with Open Surgery for Patients with Complex Aortic Aneurysms at 2 Years

Morgane Michel <sup>a,b,c,\*</sup>, Jean-Pierre Becquemin <sup>d,e</sup>, Jean Marzelle <sup>f</sup>, Céline Quelen <sup>a</sup>, Isabelle Durand-Zaleski <sup>a,c,e</sup>, on behalf of the WINDOW Trial participants <sup>†</sup>

	f/b EVAR		OSR		p (f/b EVAR vs. OSR)
	Mean (SD)	p	Mean (SD)	p	
Initial admission					
All patients	37,708 (23,196)		15,637 (15,610)		<.001
Para/juxtarenal AAA	33,889 (22,011)	<.001	14,103 (11,898)	<.001	<.001
Infra-diaphragmatic TAAA	37,472 (11,824)		16,632 (11,831)		<.001
Supra-diaphragmatic TAAA	54,121 (29,069)		42,352 (42,700)		.117
Readmissions					
All patients	12,791 (16,679)		11,749 (18,442)		<.001
Para/juxtarenal AAA	12,014 (16,577)	.430	11,471 (17,487)	<.001	.752
Infra-diaphragmatic TAAA	12,136 (14,036)		10,090 (16,767)		.575
Supra-diaphragmatic TAAA	16,466 (19,028)		23,097 (34,019)		.347
Total costs at 2 years					
All patients	46,039 (27,371)		22,779 (24,228)	<.001	<.001
Para/juxtarenal AAA	41,786 (26,290)	<.001	21,142 (20,358)		<.001
Infra-diaphragmatic TAAA	44,575 (16,956)		22,551 (18,725)		<.001
Supra-diaphragmatic TAAA	65,491 (31,909)		55,364 (60,281)		.316

Conclusions: f/b EVAR in high risk patients offers similar 2 year mortality to OSR performed in lower risk patients but at a higher cost. The cost is mainly driven by the cost of the stent graft, which is not compensated for by lower healthcare resource consumption. Further studies are necessary to evaluate the cost-effectiveness in low risk f/b EVAR patients who may experience fewer complications.

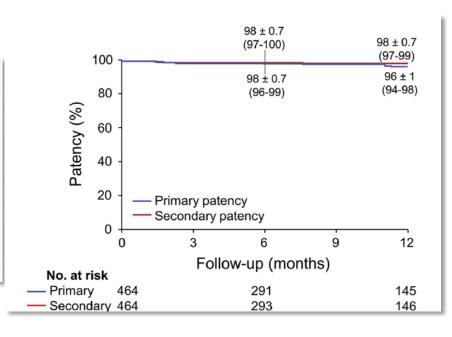


# Prospective, nonrandomized study to evaluate endovascular repair of pararenal and thoracoabdominal aortic aneurysms using fenestrated-branched endografts based on supraceliac sealing zones



Gustavo S. Oderich, MD,<sup>a</sup> Mauricio Ribeiro MD, PhD,<sup>a,b</sup> Jan Hofer, RN,<sup>a</sup> Jean Wigham, RN,<sup>a</sup> Stephen Cha, MS,<sup>c</sup> Julia Chini,<sup>a</sup> Thanila A. Macedo, MD,<sup>d</sup> and Peter Gloviczki, MD,<sup>a</sup> Rochester, Minn; and Ribeirão Preto, Brazil

	All (N = 127)	Pararenal (n $=$ 47)	Type IV TAAA ( $n=42$ )	Type I-III TAAA ( $n=38$ )	
Variables		No. (%) or r	nean ± standard deviati	on	P value
Any cause of mortality	0	0	0	0	1
Any MAE	27 (21)	10 (21)	9 (21)	8 (21)	1
Estimate blood loss higher than 1000 mL	10 (8)	1 (2)	2 (5)	7 (18)	.014
Acute kidney injury (>50% decrease in GFR)	12 (9)	4 (9)	6 (14)	2 (5)	.37
New-onset dialysis	1 (1)	1 (2)	0	0	.42
Myocardial infarction	9 (7)	4 (9)	4 (10)	1 (3)	.43
Respiratory failure	4 (3)	1 (2)	1 (2)	2 (5)	.67
Paraplegia (SCI grade 3a to 3c)	2 (2)	1 (2)	0	1 (3)	.59
Stroke	4 (3)	1 (2)	2 (5)	1 (3)	.76
Bowel ischemia requiring intensification of medical therapy	3 (2)	2 (4)	1 (2)	0	.44
Postprocedure transfusion	37 (29)	7 (15)	10 (24)	20 (53)	<.001

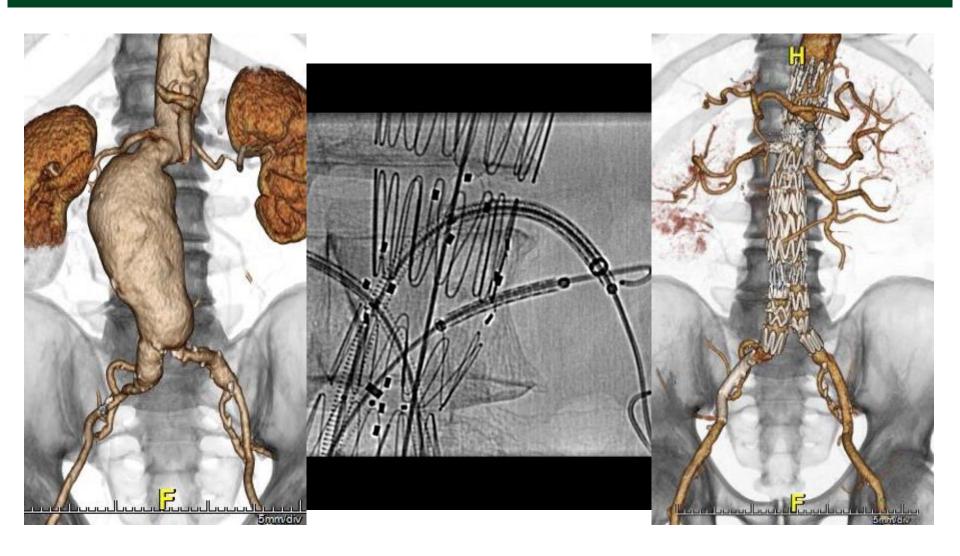


**Conclusions:** Endovascular repair of pararenal aortic aneurysms and TAAAs, using manufactured F-BEVAR with supraceliac sealing zones, is safe and efficacious. Long-term follow-up is needed to assess the impact of four-vessel designs on device-related complications and progression of aortic disease. (J Vasc Surg 2017;65:1249-59.)

J Vasc Surg 2017



#### f-EVAR for pararenal aneurysm: Zenith 3-fenestrations CMD endograft





#### f-EVAR for pararenal aneurysm: Zenith 4-fenestrations CMD endograft

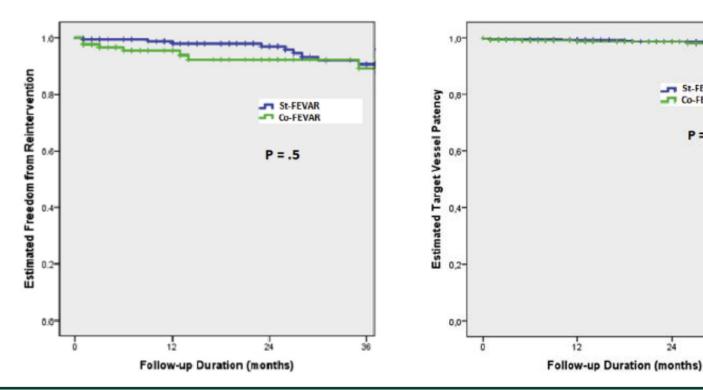




Comparison of outcomes for double fenestrated endovascular aneurysm repair versus triple or quadruple fenestrated endovascular aneurysm repair in the treatment of complex abdominal aortic aneurysms

P = .48

24

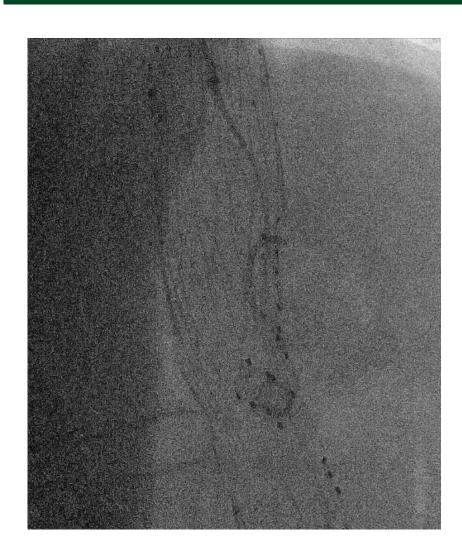


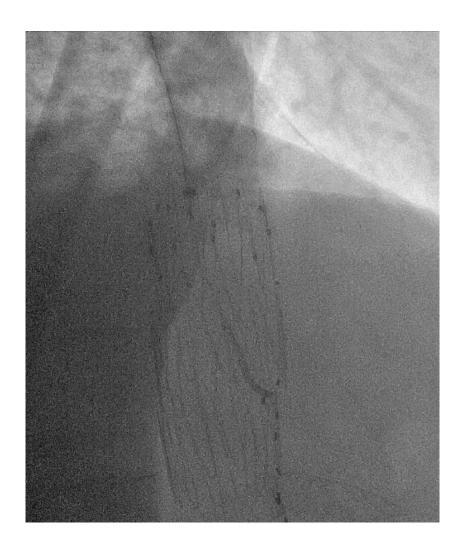
Co-FEVAR is not associated with an increase in perioperative mortality and morbidity compared with St-FEVAR

Katsargyris A et al, J Vasc Surg 2017



## Technical issues in cannulation: struggling to get into the fenestration





#### fEVAR in challenging visceral anatomies: technical issues in cannulation

- Down-warding/posterior orientation
- Target vessel stenosis/stenting
- Previous EVAR (struts across vessel ostium)
- Median arcuate ligament compression



## Technical issues in fEVAR cannulation: how to manage?

- Access from above (endograft platform)
- Balloon assisted cannulation
- Retrograde cannulation
- Robotic-assisted procedure



Increased procedural time, radiation exposure and contrast burden



# Upper extremity access for fenestrated endovascular aortic aneurysm repair is not associated with increased morbidity

Martyn Knowles, MD, David A. Nation, MD, David E. Timaran, MD, Luis F. Gomez, MD, M. Shadman Baig, MD, R. James Valentine, MD, and Carlos H. Timaran, MD, Dallas, Tex

	Femoral access $(n = 50)$ ,	Upper extremity access $(n = 98)$ ,	
Variables	(n = 30), $mean \pm SD$		ates
Fenestrations, No.	$2.72 \pm 0.09$	3.25 188	.0001
Operative time, min	$258.8 \pm 14.1$	<b>227.0</b> 10.6	. A008
EBL, mL	493.5 ± 43 P	<b>3</b> 784.8 ± 65/7	0058
Transfusion	1.23 (UBT	2.17 304	
Length of stay, days	erdtusi erdtusi	0611	27
	3.42 ± 1.6	$4.20 \pm 0.38$	.27
Total	7.68428	$7.03 \pm 0.47$	.78

Table IV. Local and cerebrovascular epications by right vs left upper extremely

Complication $(n = 6)$ , No. (%)	(n = 92), No. (%)	P
Vecomplications tion (%)	4 (4) 1 (1)	.6 .8
-0/ 5010	1 (1)	0

Table V. Local and cerebrovascular complications by open vs percutaneous upper extremity access

Complication	Percutaneous access (n = 12), No. (%)	Open access (n = 86), No. (%)	P
Local complications	2 (17)	2 (2)	.02
CVA	0 (0)	1 (1)	.7

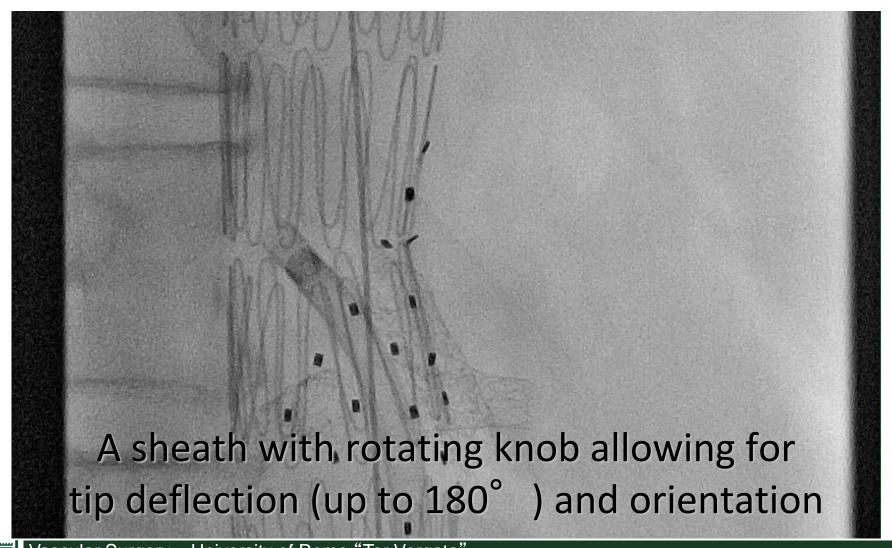
CVA, Cerebrovascular accident.

Conclusions: Upper extremity access appears to be a safe and feasible approach for patients undergoing FEVAR. Open exposure in the upper extremity may be safer than percutaneous access during FEVAR. Unlike chimney and snorkel grafts, upper extremity access during FEVAR is not associated with an increased risk of stroke, despite the need for multiple visceral vessel stenting. (J Vasc Surg 2015;61:80-7.)

J Vasc Surg 2015

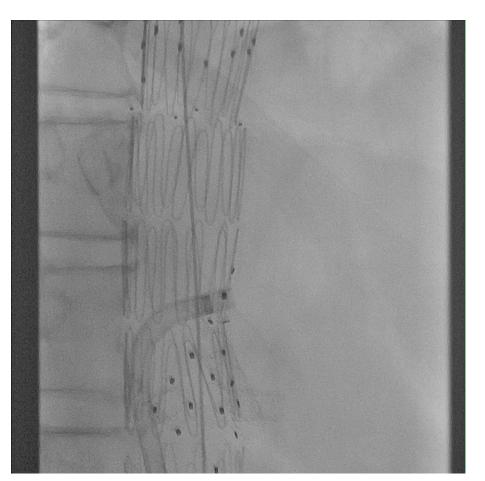


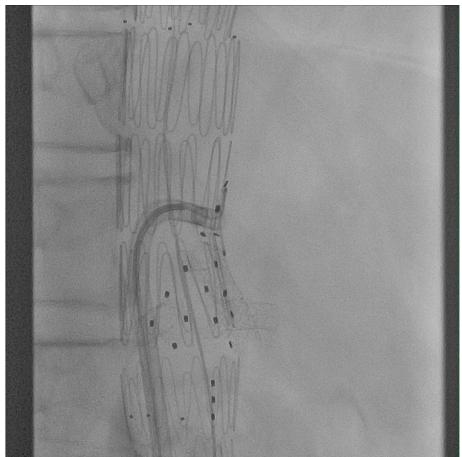
## You struggle to get into the fenestration: try a steerable guiding sheath



#### Steerable guiding sheaths: advantages Support for all the procedural steps

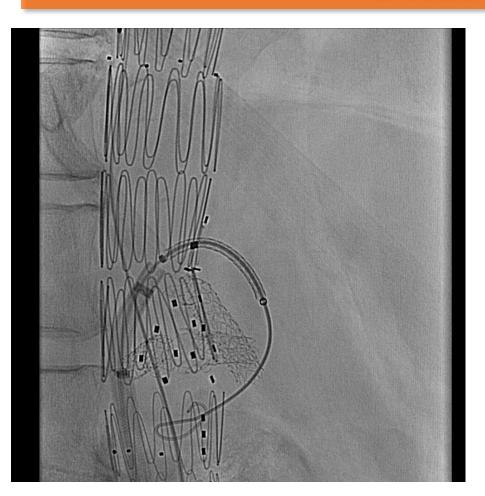
#### 1. Fenestration and vessel cannulation

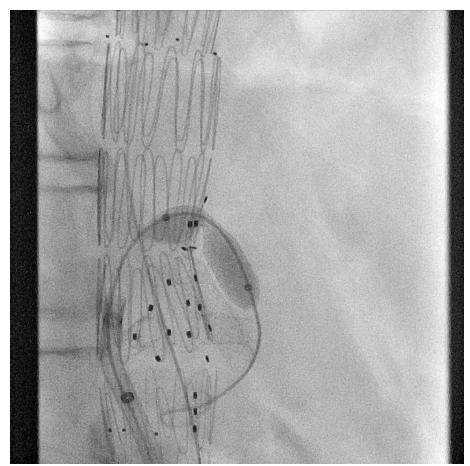




### Steerable guiding sheaths: advantages Support for all the procedural steps

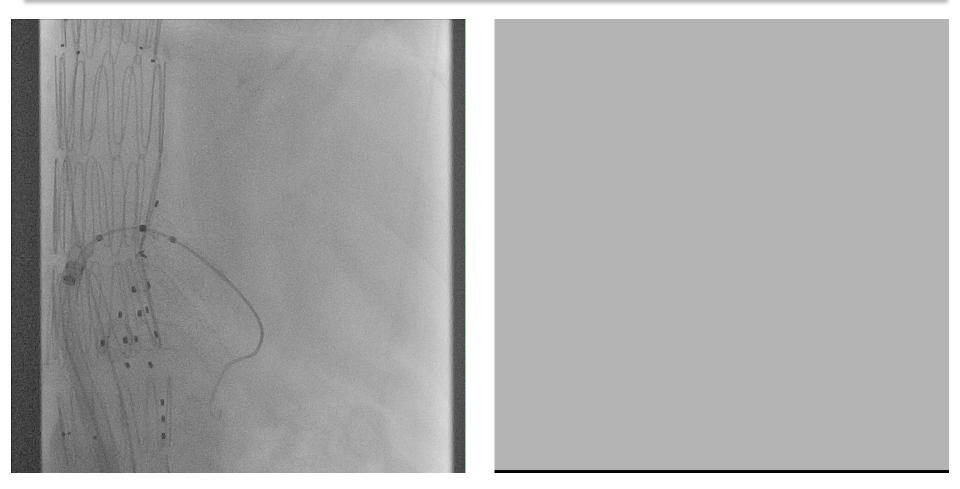
#### 2. Vessel stenting





#### Steerable guiding sheaths: advantages Support for all the procedural steps

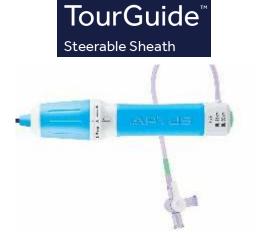
#### 3. Stent Flaring



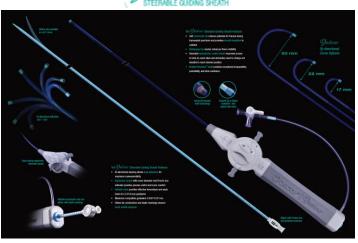


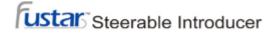
#### Steerable guiding sheaths: devices current available









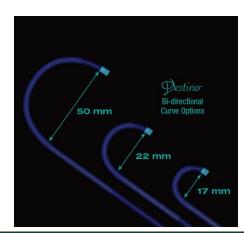


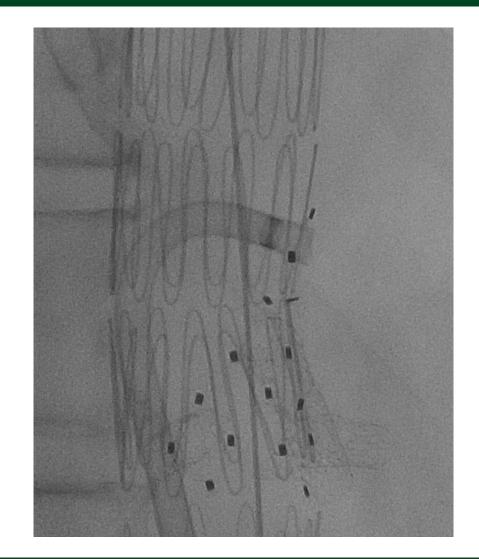




#### Steerable guiding sheaths: tips and tricks in device selection

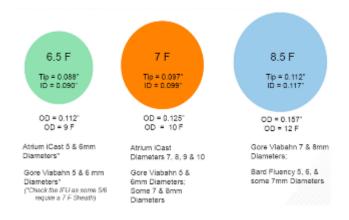
1. Consider the graft size to allow maximum apposition between catheter and endograft

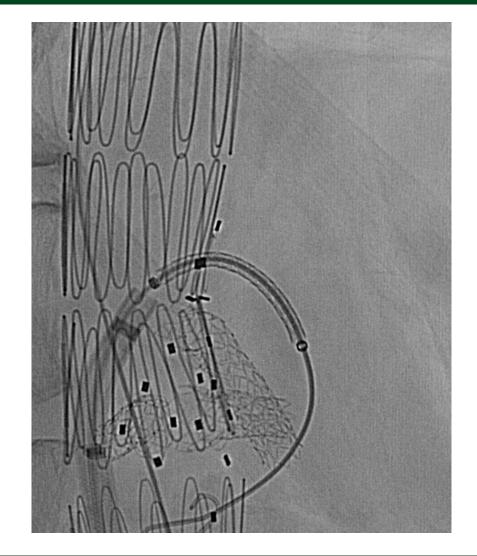




#### Steerable guiding sheaths: tips and tricks in device selection

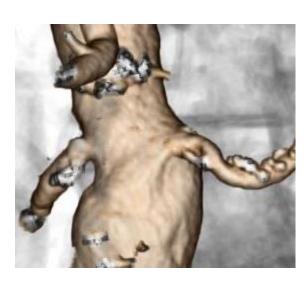
# 2. Consider the materials planned to be used to ensure compatibility

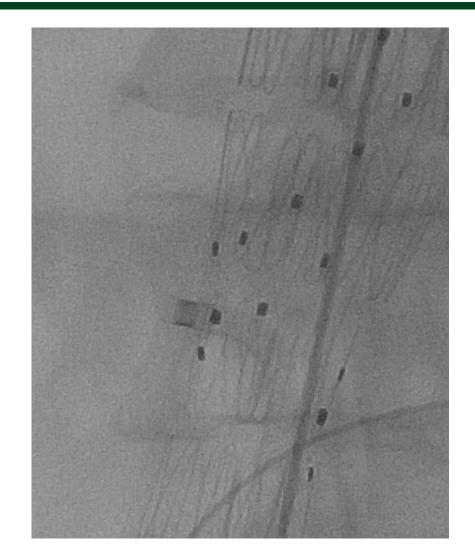




#### Steerable guiding sheaths: tips and tricks in device selection

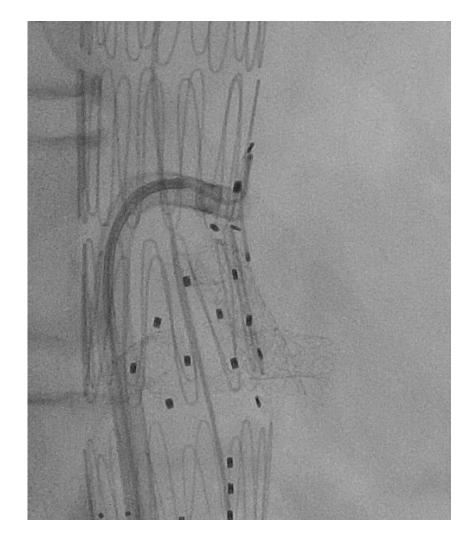
3. Consider the target vessel anatomy to increase support according to the vessel orientation





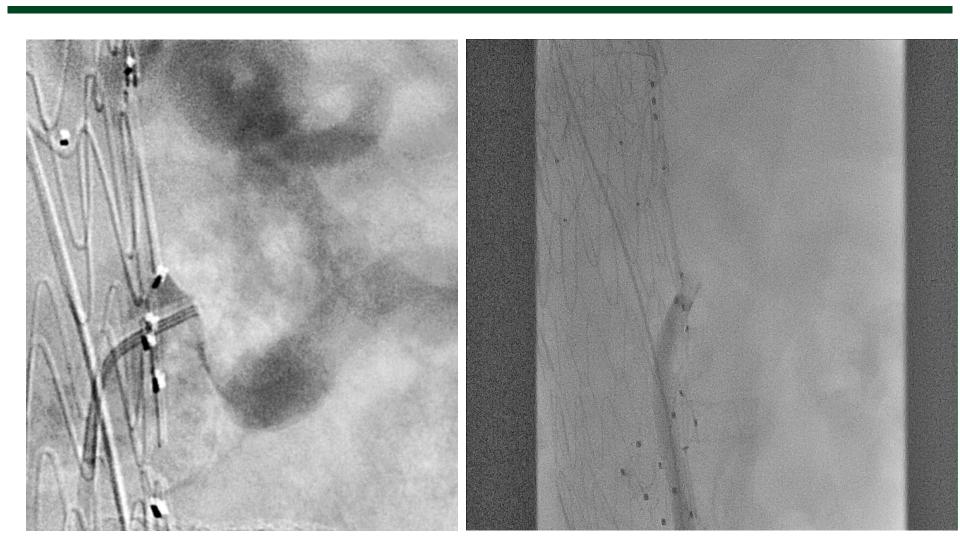
### Steerable guiding in complex FEVAR: our strategy

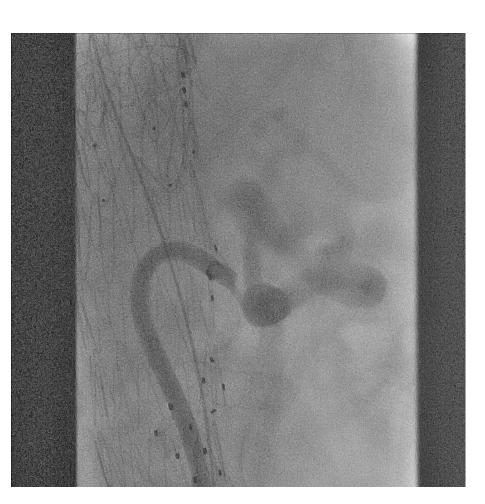
- After failure of standard techniques
- 7-8 F for renal arteries
- 10-12 F for SMA and CT
- Use as working sheath for all the FEN steps (cannulation, stenting and flaring)

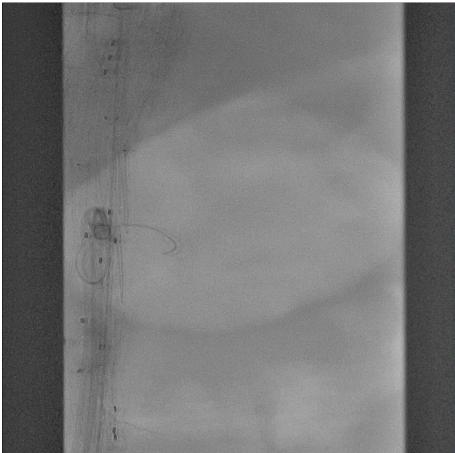




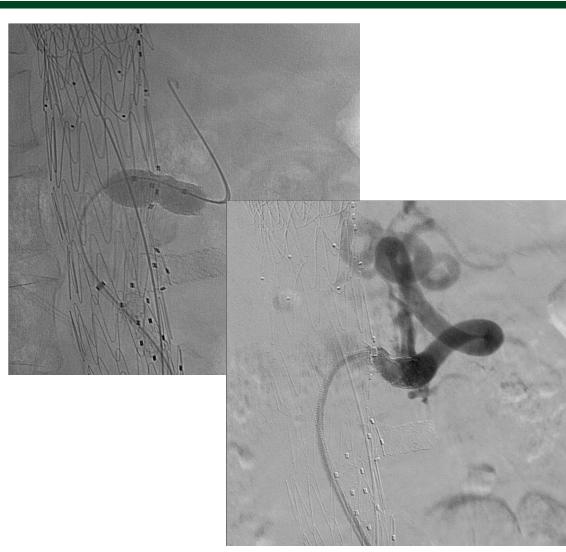


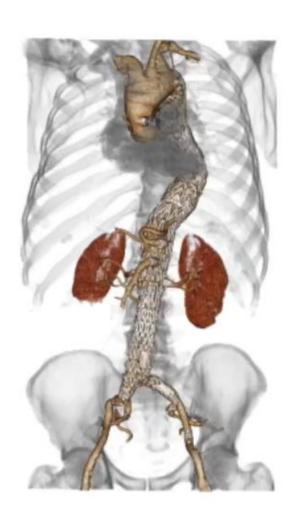


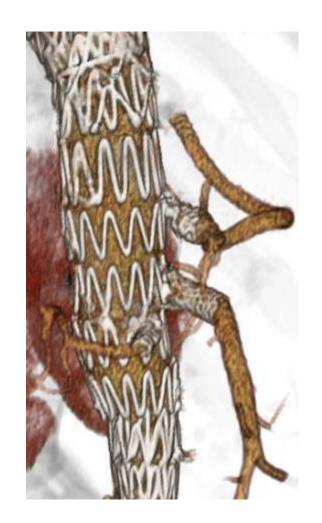




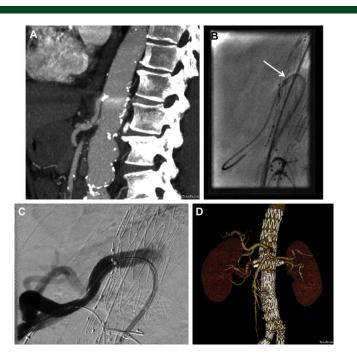








#### Results of celiac trunk stenting during fenestrated or branched aortic endografting



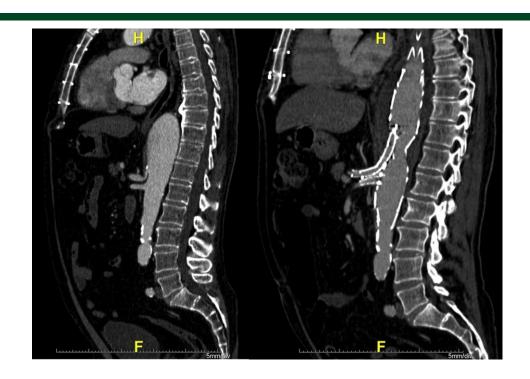
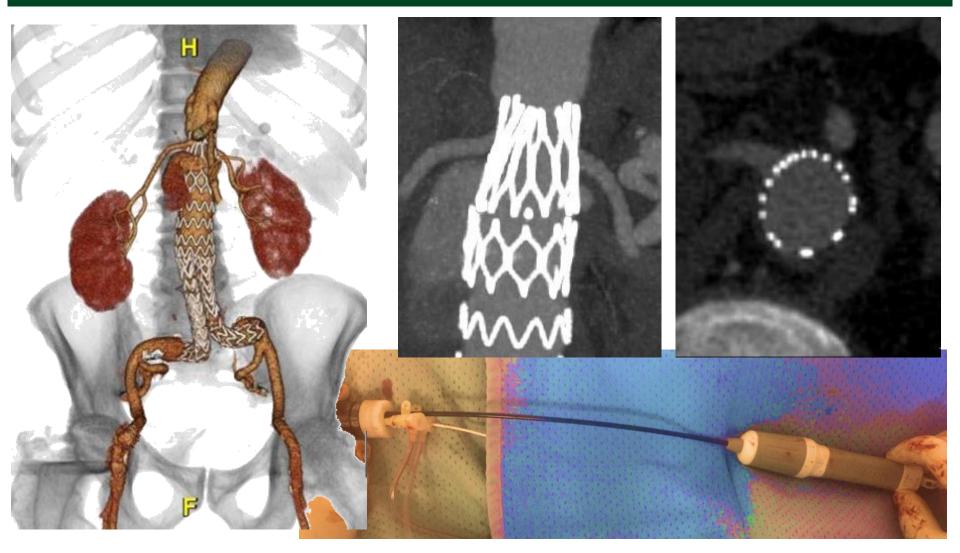


Table III. Follow-up

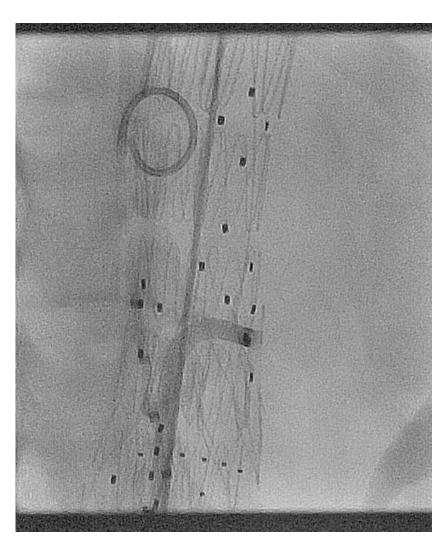
	Population (n = 113)	MALS+ (n = 45)	MALS- (n = 68)	P
Median follow-up (mo), median (CI)	17.9 (13.6-24.2)	22.9 (15.0-26.9)	15.2 (12.6-24.2)	.794
Bridging stents, n (%)				
Kinking	6 (5.7)	6 (15.8)	O (O.O)	.002
Thrombosis	1 (0.9)	O (O.O)	1 (2.2)	.359
Endoleak	0 (0.0)	0 (0.0)	0 (0.0)	_

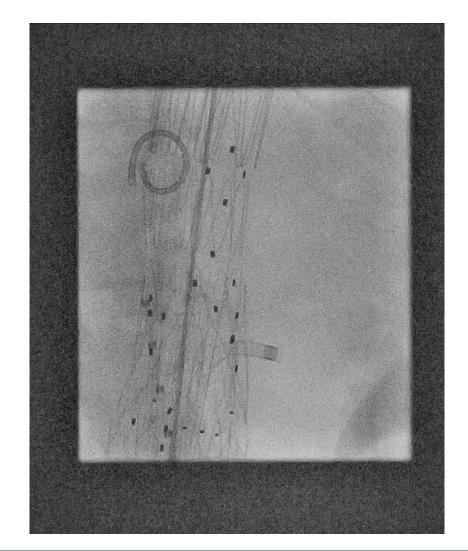
Wattez H et al., J Vasc Surg 2016

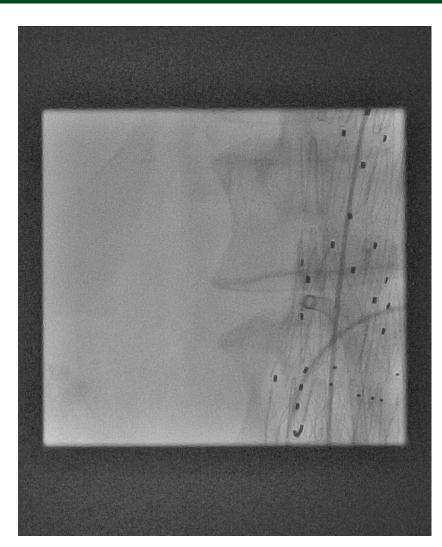


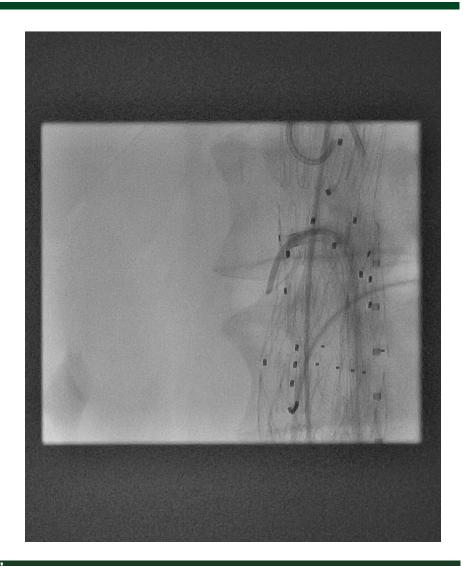


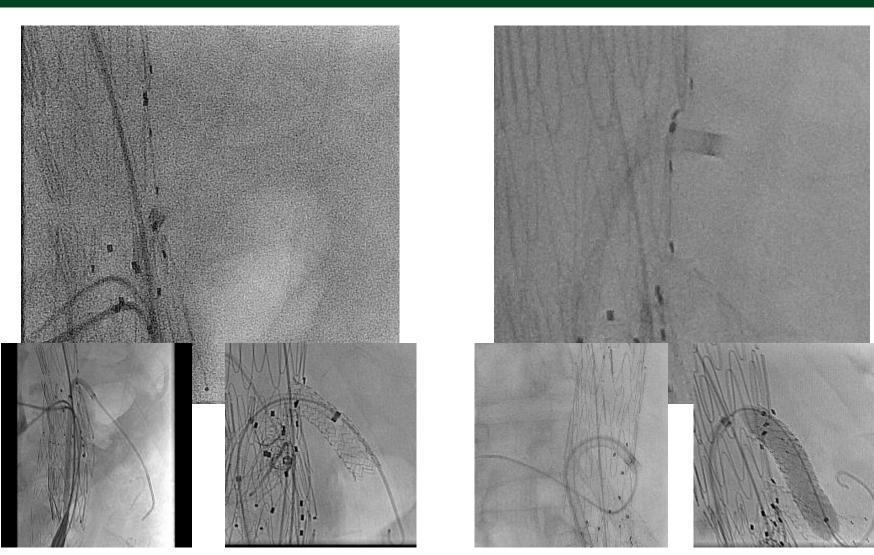




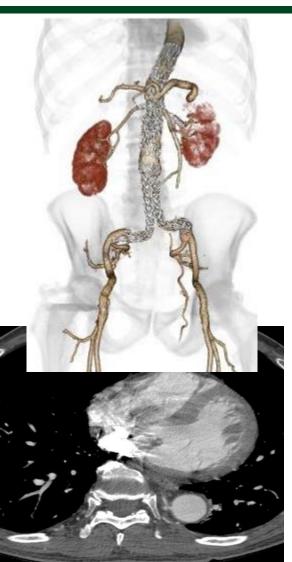














#### Conclusion

- By changing tip orientation and angulation, steerable guiding sheaths may overcome technical difficulties related to fenestration cannulation
- They improve support and stability at target areas, for all the FEVAR procedural steps
- Steerable guiding sheaths should be part of the equipment of any centers performing advanced fenestrated and branched endografting



#### **EDITORIAL**

#### Fenestrated and branched endovascular aortic repair has reached a state of maturity



Stéphan Haulon, MD, PhD, Lille, France

- Learning curve (patient selection, SCI prevention)
- Endograft design (increase fenestration for a durable fixation)
- Dedicated bridging stents
- Intraoperative imaging (fusion, cone-beam CT scan)

