31 GIORNATE CARDIOLOGICHE TORINESI

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2019

AORTIC ARCH AND THORACO-ABDOMINAL AORTIC DISEASE

Are total endovascular solutions ready for primetime?

G Pratesi, MD

Vascular and Endovascular Surgery
CardioThoracoVascular Department (DICATOV) - Ospedale Policlinico San Martino
Department of Integrated Surgical and Diagnostic Sciences (DISC) - University of Genoa
Chief: Prof. D. Palombo

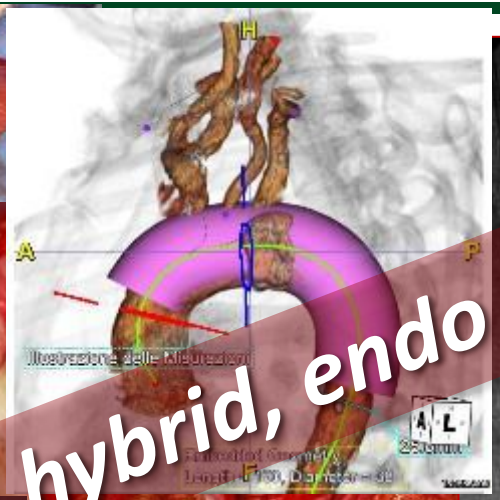
Disclosures

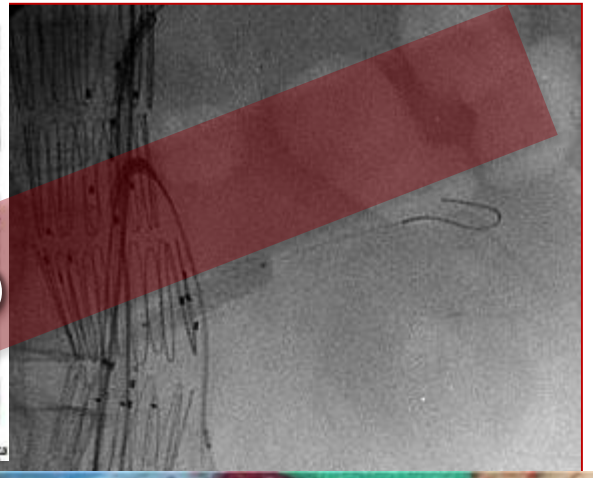
- Consulting: Abbott, Cook, Cordis, Medtronic, WL Gore & Associates, Terumo Aortic

Aortic arch and thoraco-abdominal aortic disease: critical issues

- Complex patients (age, comorbidities, urgent setting)
- Complex lesions (supraortic and visceral vessels involvement, intercostal and pelvic arteries)
- Complex treatments (risk of stroke, paraplegia, renal failure)

Aortic arch and thoraco-abdominal aortic disease: decision making





Open, hybrid, endo

Editor's Choice — Current Options and Recommendations for the Treatment of Thoracic Aortic Pathologies Involving the Aortic Arch: An Expert Consensus Document of the European Association for Cardio-Thoracic Surgery (EACTS) & the European Society for Vascular Surgery (ESVS)

Recommendation 30

Endovascular aortic arch repair in zone 0 should be considered in patients unfit for open surgery and with a suitable anatomy

Class	Level	References
IIa	B	[199,203]

Recommendation 31

It is recommended that endovascular aortic arch repair is performed in centres with adequate volume of and expertise in open and endovascular arch repair

Class	Level	References
I	C	-

Recommendation 33

The PG technique should be considered in urgent TEVAR procedures requiring a seal in landing zones 0–2 without adequate options for open surgery or supraaortic debranching and as a bail-out strategy in cases where unintended obstruction of a supra-aortic vessel occurred during TEVAR

Class	Level	References
IIa	C	-

Recommendation 34

The PG technique is not recommended as a routine strategy in preserving flow to major supra-aortic branches in zones 0–2 if other strategies (open surgery, branched/fenestrated stent grafts) are available

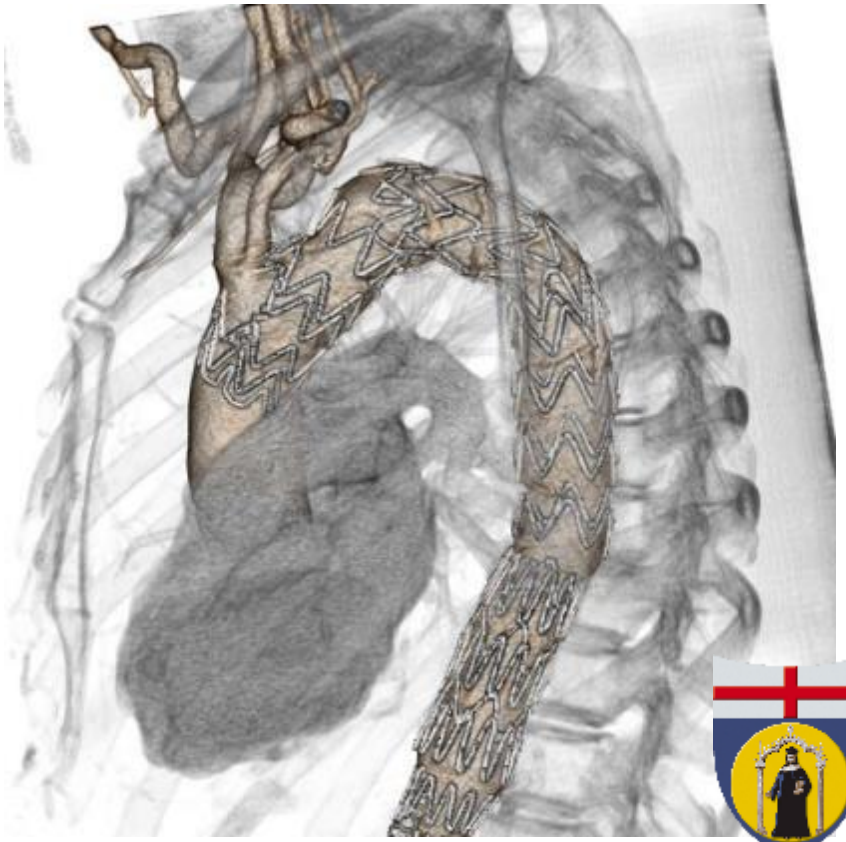
Class	Level	References
III	C	-

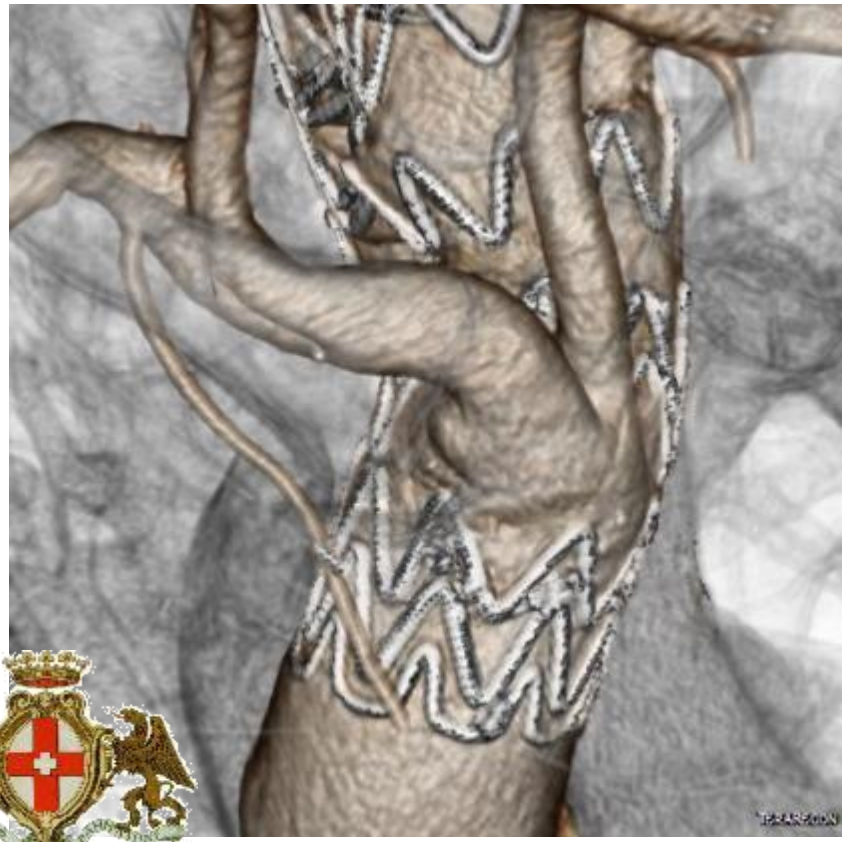
PG: parallel graft.

Eur J Vasc Endovasc Surg (2019)

Are total endovascular solutions ready for primetime? Aortic arch

Endovascular aortic arch repair: dedicated stent-graft





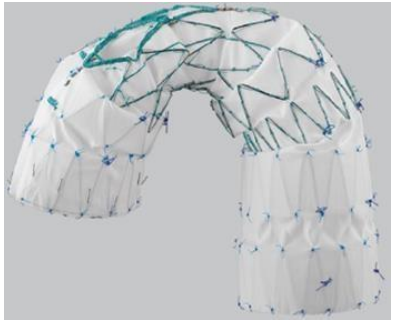
Endovascular aortic arch repair: dedicated stent-graft

Off-the-shelf

- Gore TBE
- Medtronic Mona-LSA
- Endospan Nexus

Custom-made

- Cook
- Bolton
- Najuta



Branched versus fenestrated endografts for endovascular repair of aortic arch lesions

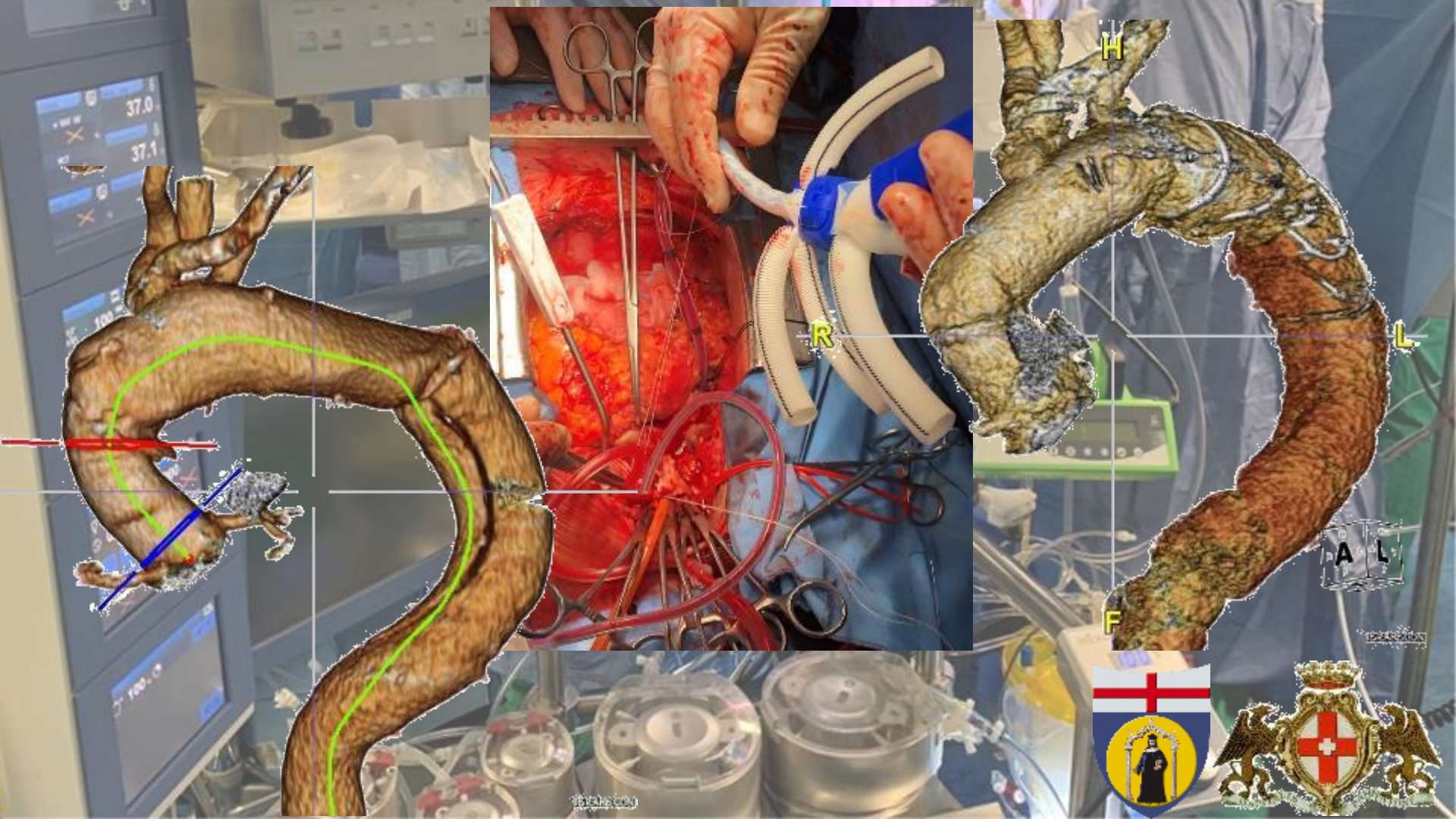
	fTEVAR (n = 15)	*bTEVAR (n = 14)*	P
Procedure time, minutes	153 ± 23	270 ± 26	.02
Fluoroscopy time, minutes	36 ± 8	47 ± 8	NS
Intensive care unit stay, days	3.3 ± 1.2	3.8 ± 0.6	NS
Hospital stay, days	7 ± 5	14 ± 8	.02
Thirty-day mortality	3 (20)	0	NS
Myocardial infarction	0	1 (7)	NS
Relevant respiratory complications	2 (14)	0	NS
Major stroke	2 (14)	1 (7)	NS
Retrograde type A dissection	0	0	NS
Cardiac infarction	1	0	NS
Acute kidney injury (no dialysis)	2 (14)	1 (7)	NS
Acute kidney injury (dialysis)	0	0	NS
Pancreatitis	0	1 (7)	NS
Access site complications (minor and major)	3 (20)	1 (7)	NS

f/TEVAR and b/TEVAR have a role in the management of aortic arch diseases, although arch branched devices are surely more suitable for extended, complex arch diseases

Tsilimparis et al, J Vasc Surg 2016

Total endovascular arch repair: critical issues

- Proximal landing zone
  - Lenght
  - Size
  - Angulation
  - Previous ascending repair
  - Discrepancy with distal landing zone
- Arch variability
  - Anatomical variations
  - Variable branch vessels take off
  - Dissected arch
  - Dissected supra-aortic trunks
- Access vessels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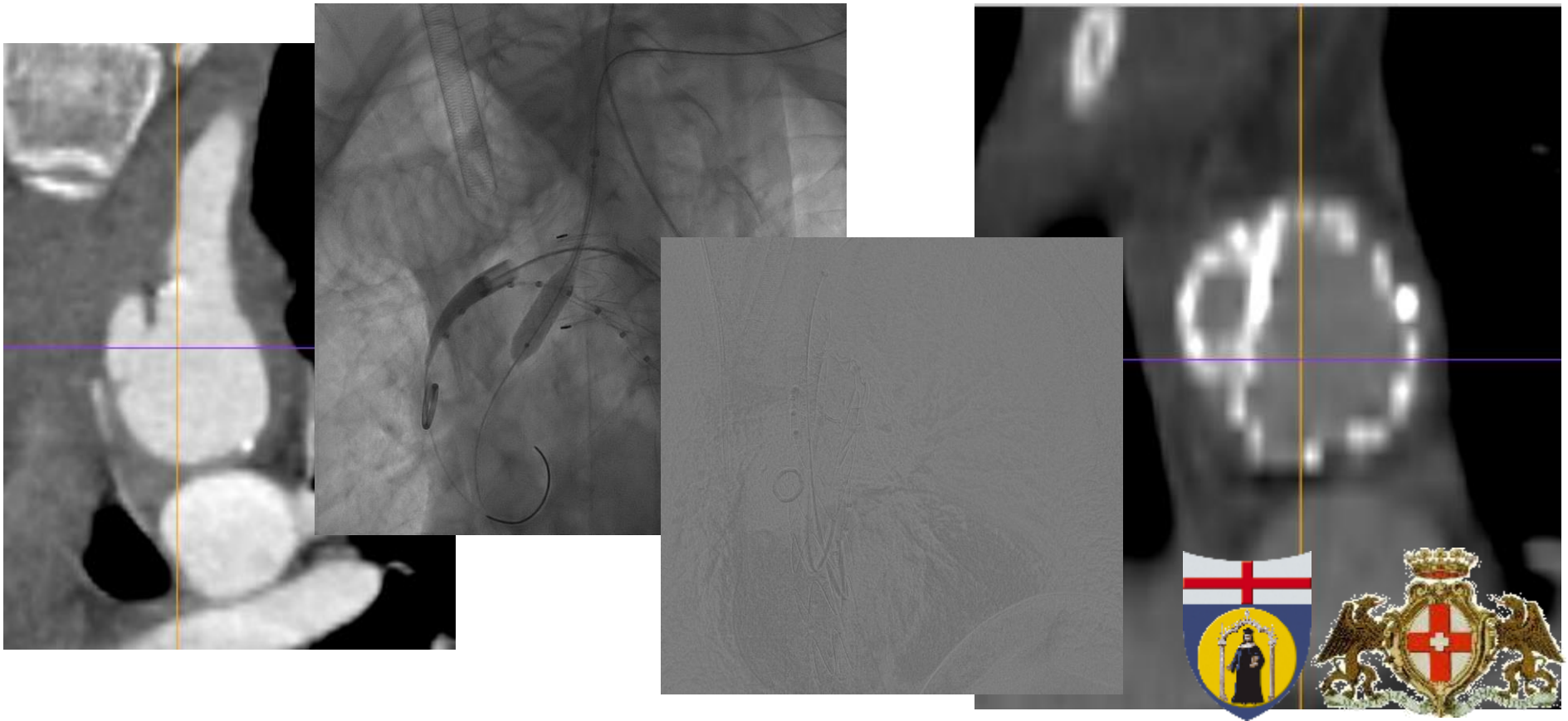
Endovascular solutions for aortic arch: TEVAR + LSA chimney (single)



Clinical Investigation

JOURNAL OF ENDOVASCULAR THERAPY

Journal of Endovascular Therapy
2018, Vol. 25(6) 740–749

DOI: 10.1177/1526602818802581
www.jevt.org
SAGE

Comparison of Two Different Techniques for Isolated Left Subclavian Artery Revascularization During Thoracic Endovascular Aortic Repair in Zone 2

Gabriele Piffaretti, MD, PhD[1], Giovanni Pratesi, MD[2], Guido Gelpi, MD[3], Mario Galli, MD[4], Frank J. Criado, MD[5], and Michele Antonello, MD[6]

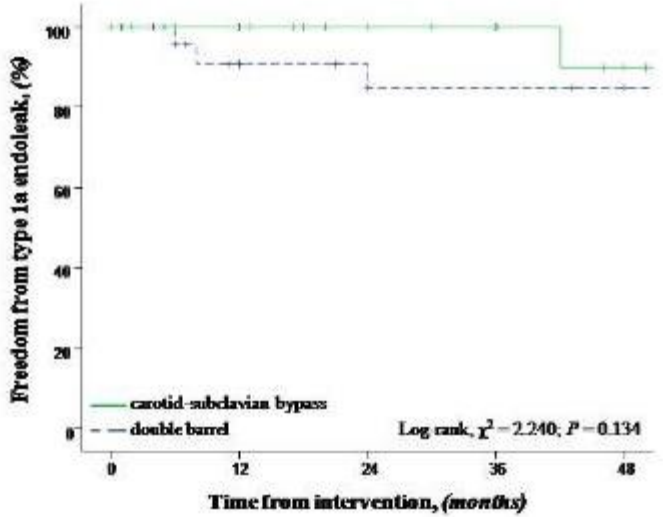
308 patients overall cohort of TEVAR

73 patients with LSA revascularization +TEVAR

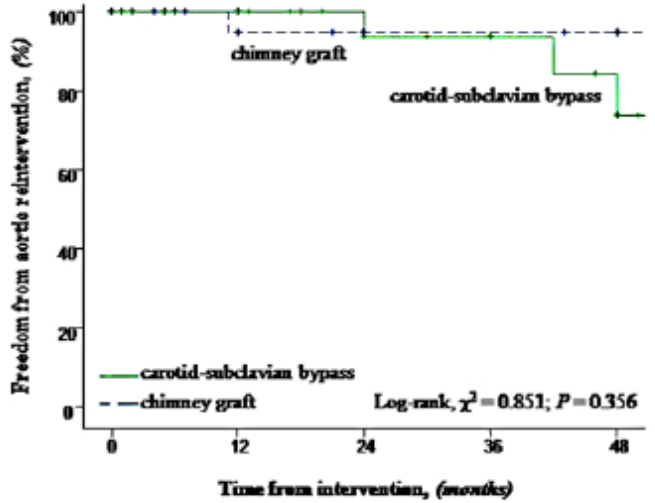
56 (77%) male patients; mean age: 68 ± 13 (range, 22-87; iqr, 61-78)

Car-succ bypass (CSbp)	**42** *(57.5%)*	**31** *(42.5%)*	*Chimney Graft (CG)*

Long-term outcomes

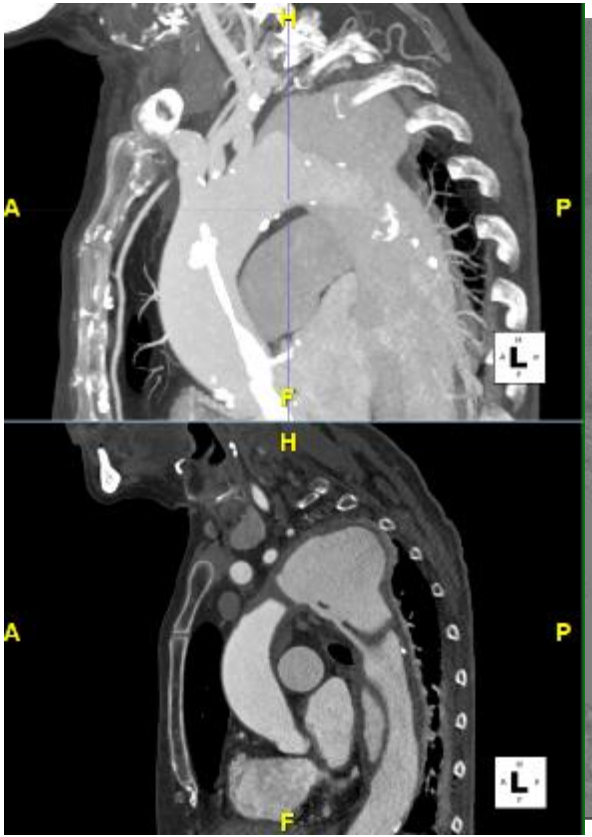


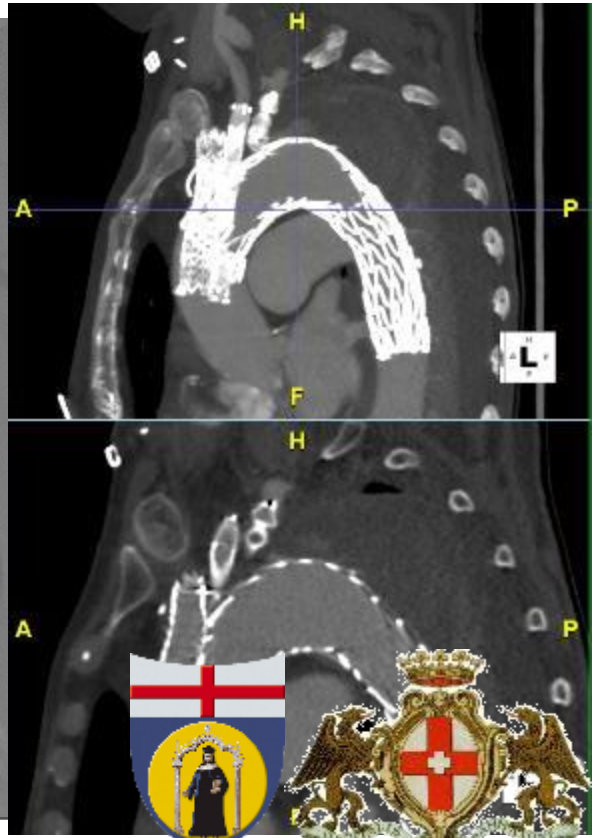
No. at risk	31 42	17 27	14 15	10 12	8 7
FF Redo, (%)	95 100	91 100	85 100	85 100	85 90
S.E.	5 0	6 0	8 0	8 0	8 9



No. at risk	31 42	17 27	14 15	10 12	8 7
FF Redo, (%)	95 100	95 100	95 94	95 94	95 74
S.E.	5 0	5 0	5 6	5 6	5 10

Endovascular solutions for aortic arch: TEVAR + double chimney (IA+LtCCA)





A current systematic evaluation and meta-analysis of chimney graft technology in aortic arch diseases

Wael Ahmad, MD, Spyridon Mylonas, MD, Payman Majd, MD, *and* Jan Sigge Brunkwall, MD, PhD,
Cologne, Germany

- 373 patients and 387 CGs from 11 studies
- Technical success: 91.3%
- Early type Ia endoleak: 9.4%
- 1.8% retrograde type A dissection
- 2.6% incidence of major stroke
- 30-day mortality rate: 7.9%
- reintervention rate: 10.6%

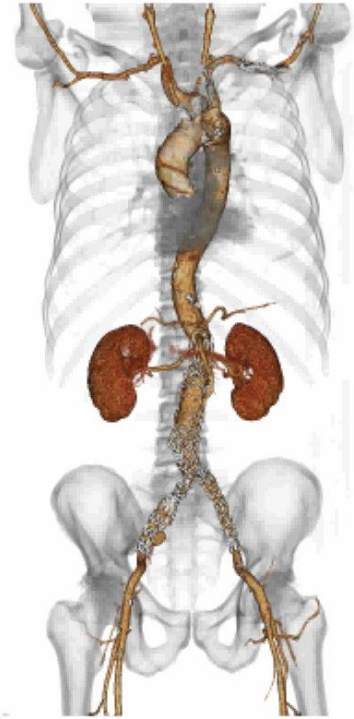
Authors	Year of study	No. of patients	No. of chimneys	Technical success, %	30-Day mortality, No. (%)	P-ELI, No. (%)	Stroke, No. (%)
Bosiers et al	2016	95	102	89.5	9 (9.5)	10 (10.5)	2 (2.1)
Xue et al	2015	59	59	92	0 (0)	5 (8.5)	2 (3.4)
Liu et al	2015	41	43	100	0 (0)	0 (0)	0 (0)
Zhu et al	2013	34	34	82	0 (0)	5 (14.7)	0 (0)
Zhang et al	2016	30	30	100	3 (10)	4 (13.3)	0 (0)
Huang et al	2016	27	30	85	0 (0)	4 (14.8)	0 (0)
Lu et al	2015	25	25	88	0 (0)	3 (12)	0 (0)
Bin Jabr et al	2015	22	24	100	4 (18.2)	3 (13.6)	NA
O'Callaghan et al	2014	18	18	94	3 (16.7)	1 (5.6)	1 (6.6)
Shirakawa et al	2014	12	12	92	1 (8.3)	1 (8.3)	0 (0)
Inoue et al	2015	10	10	80	0 (0)	2 (20)	0 (0)

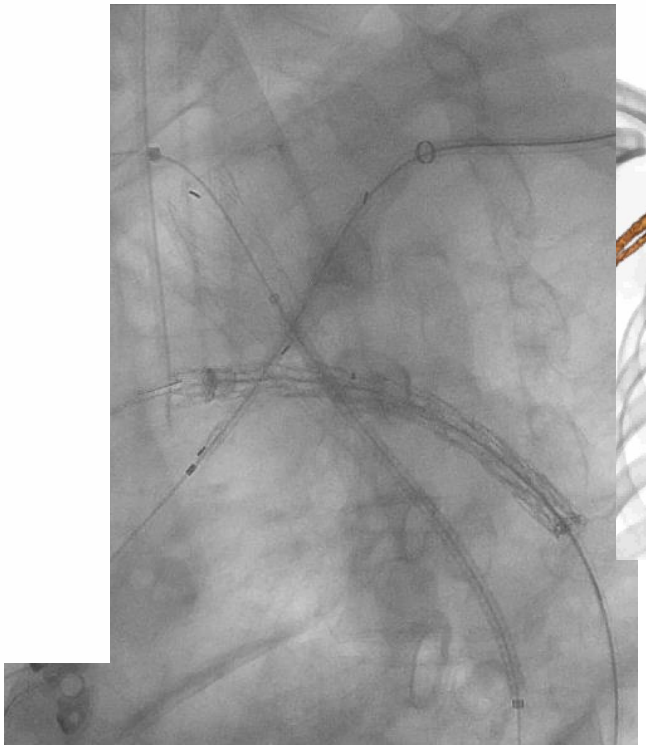
P-ELI, Procedural type I endoleak; *NA*, not available—information not reported.

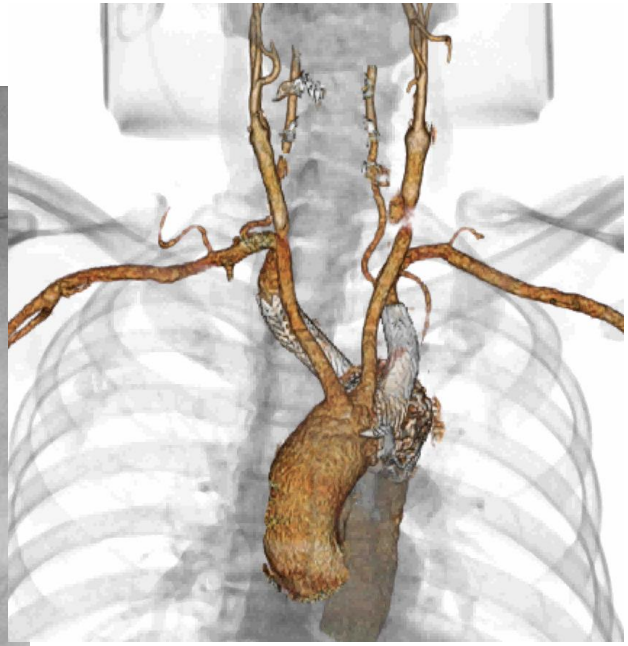
Conclusions: Treatment of aortic diseases involving the aortic arch poses a great challenge. The CG technique has been applied as an alternative treatment option. This meta-analysis shows that endovascular repair of aortic arch disease using a CG technique in the aortic arch vessels is technically feasible and effective but not without major risk of complications. (J Vasc Surg 2017;66:1602-10.)

J Vasc Surg 2017

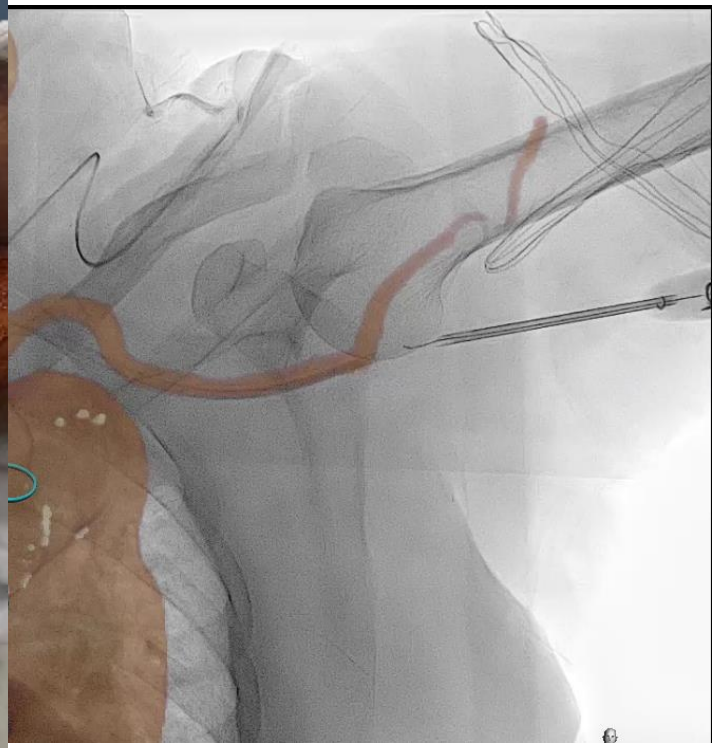
Endovascular solutions for aortic arch: TEVAR +Periscope for ARSA and Chimney for LSA



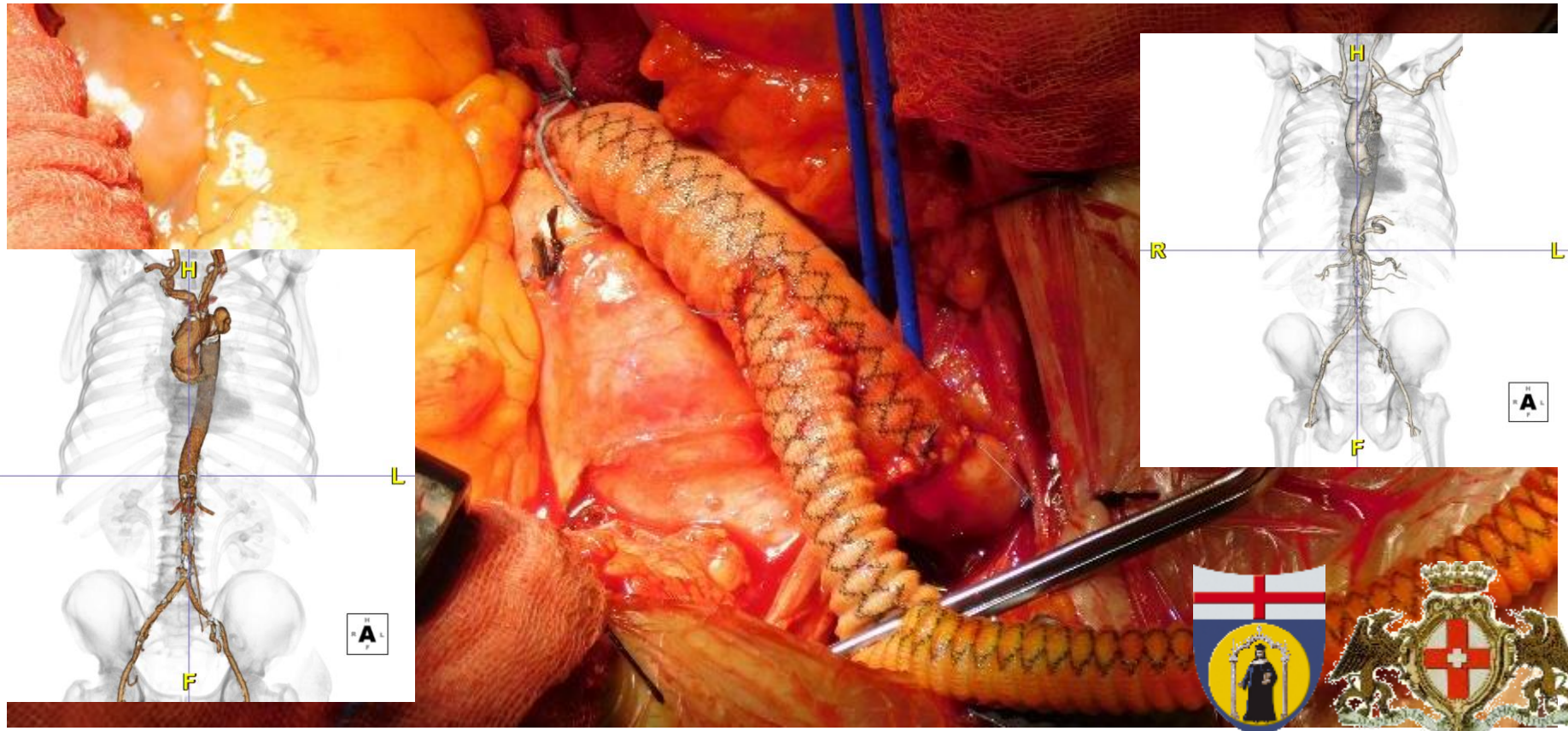




Bilateral percutaneous axillary artery access for total endoTx of aortic arch



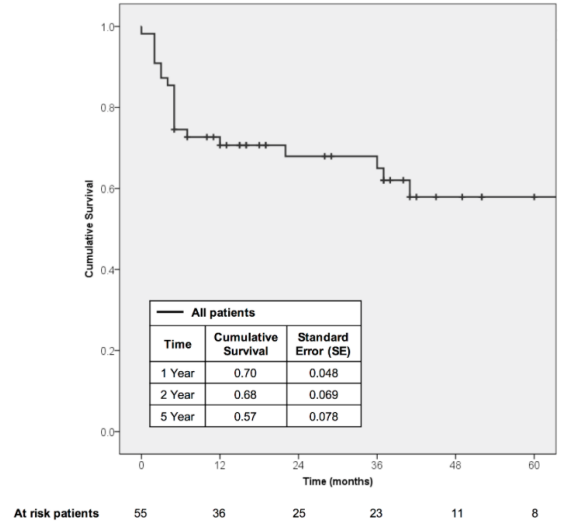
Hybrid treatment of aortic arch: zone 0

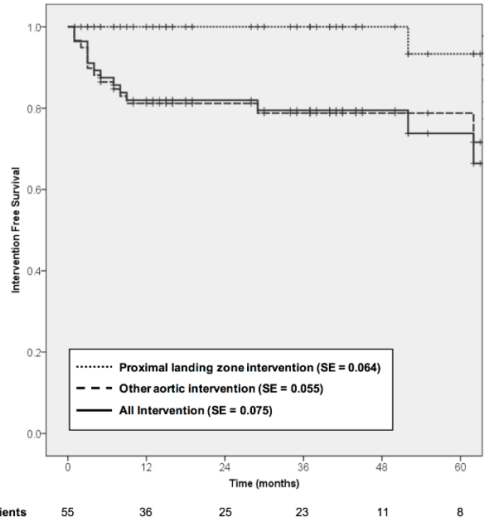


Short- and Long-term Results of Hybrid Arch and Proximal Descending Thoracic Aortic Repair: A Benchmark for New Technologies.

Table 2. Supra-aortic Debranching Procedures in 55 Patients According to the Landing Zone.[a]

Zone 0 (n=14)	
Ascending-IA + RCCA-LCCA bypass	4
Ascending-IA/LCCA bifurcated bypass	8
Scallop/fenestration IA + RCCA-LCCA bypass	2
Including LCCA-LSA bypass/transposition	9
Zone 1 (n=20)	
RCCA-LCCA bypass	17
Scallop/fenestration LCCA	1
LCCA-RCCA bypass	1
RCCA-RSA bypass	1
Including LCCA-LSA bypass/transposition	12
Zone 2 (n=21)	
LCCA-LSA bypass/transposition	21



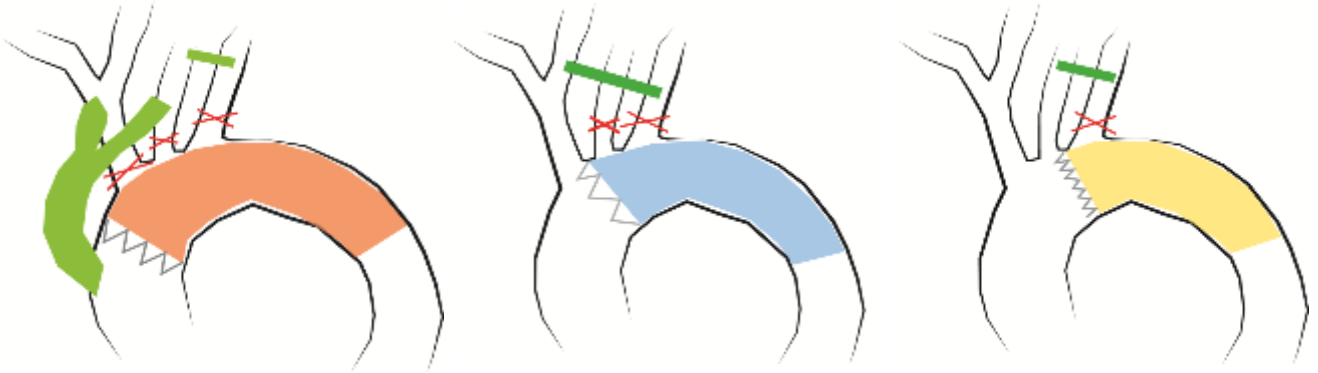


Hybrid repair of the aortic arch and proximal descending thoracic aorta is technically feasible, with acceptable short-term mortality. There is a low rate of proximal landing zone reintervention with hybrid techniques. Extra-anatomic bypass grafts have good long-term patency.

Martin G et al, J Endovasc Ther 2016

Hybrid treatment of aortic arch

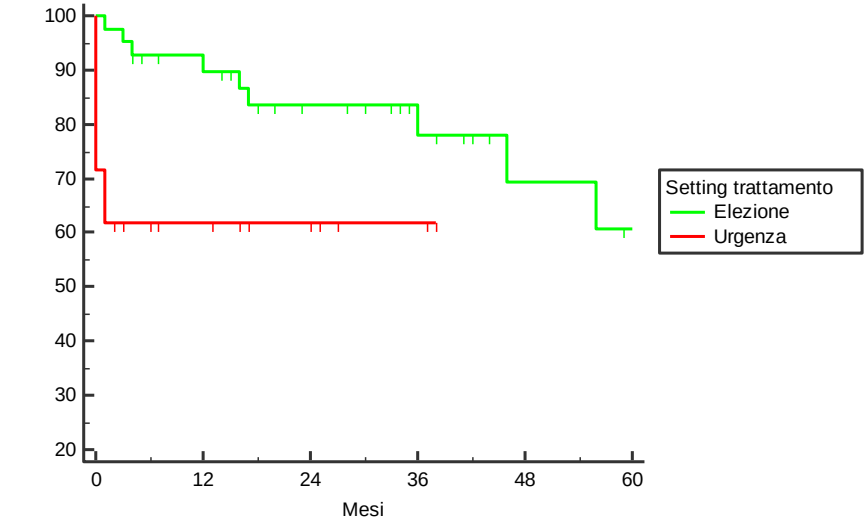
Vascular and Endovascular Surgery- HSM (2009-2019)



	ZONE 0		ZONE 1		ZONE 2		
	26		11		25		TOT
		URGENT		URGENT		URGENT	URG
ANEURYSM	9	0	3	O	4	O	**0**
PAU	8	1	3	0	3	1	**2**
TBAD/IMH	9	6	5	4	16	8	**18**
ISTHMIC RUPTURE	0	O	0	0	2	2	**2**

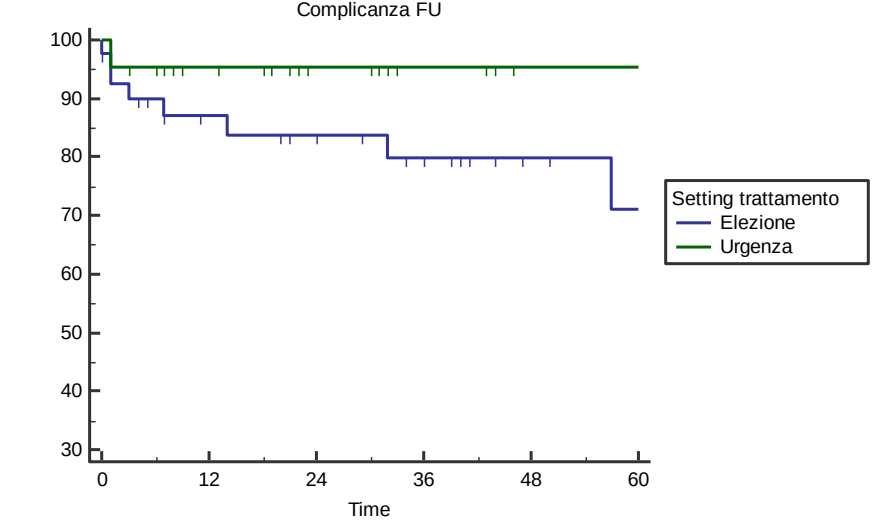
Hybrid treatment of aortic arch

Vascular and Endovascular Surgery- HSM (2009-2019)



Number at risk

Group: Elezione						
	41	31	22	14	8	6
Group: Urgenza						
	15	9	5	2	0	0



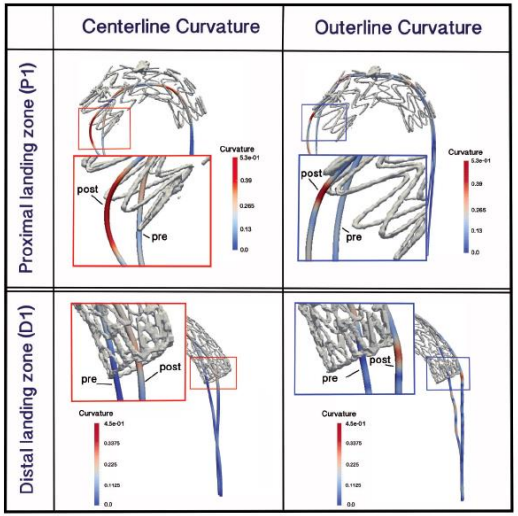
Number at risk

Group: Elezione						
	38	28	23	18	11	8
Group: Urgenza						
	21	15	8	4	1	1

Conformability analysis: from 3D printing to computational analysis

Assessment of geometrical remodelling of the aortic arch after hybrid treatment

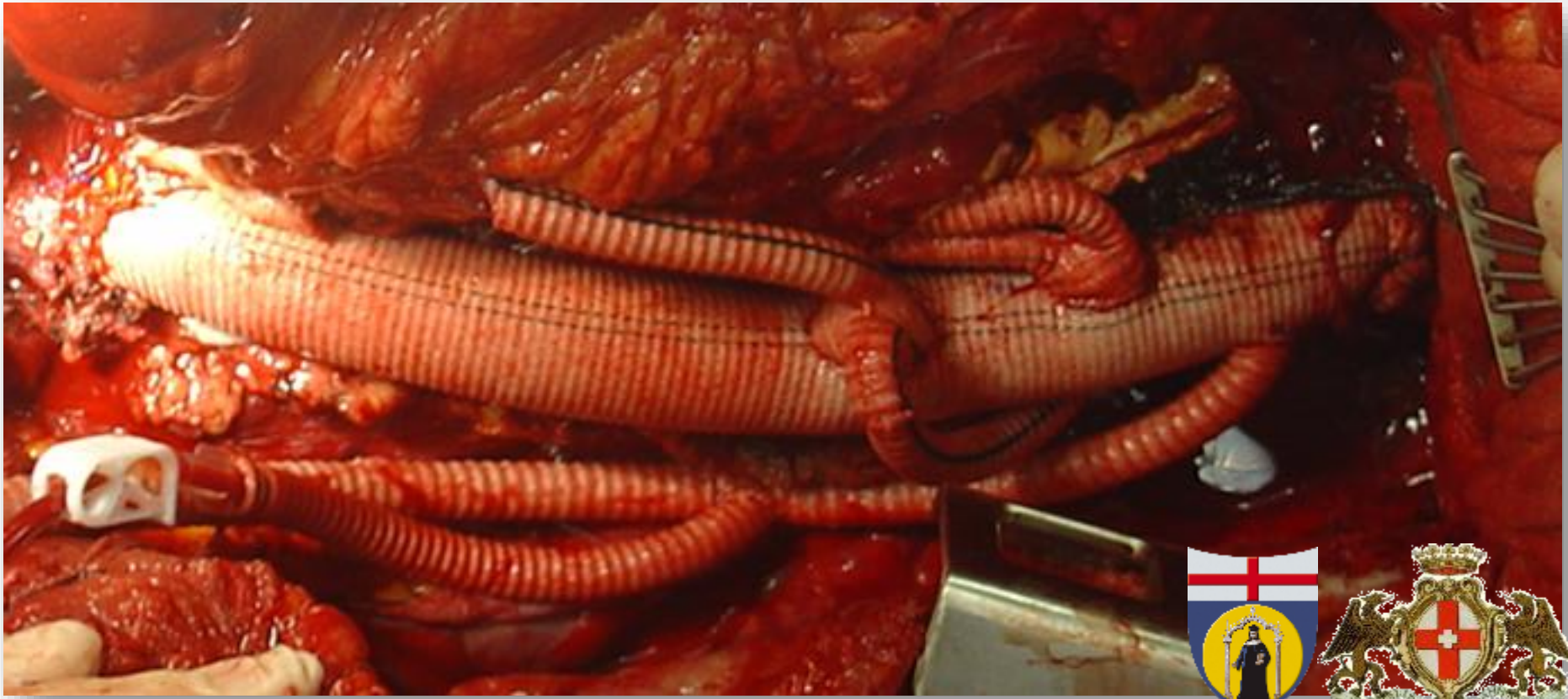
Giovanni Spinella[a,*†], Alice Finotello[a,b,†], Michele Conti[c], Elena Faggiano[c], Valerio Gazzola[a], Ferdinando Auricchio[c], Nabil Chakfé[d,e], Domenico Palombo[a] and Bianca Pane[a]



CONCLUSIONS: Hybrid arch repair was associated with a significant elongation of the vessel and a significant increase in the curvature on the ascending aorta and the descending aorta and on the endograft proximal and the distal landing zones.

European Journal of Cardio-Thoracic Surgery, 2018

Are total endovascular solutions ready for primetime? Thoraco-abdominal aortic disease



Open repair of thoracoabdominal aortic aneurysms in experienced centers

Konstantinos G. Moulakakis, MD,[a] Georgios Karaolanis, MD,[b] Constantine N. Antonopoulos, MD,[a] John Kakisis, MD,[a] Christos Klonaris, MD,[b] Ourania Preventza, MD, FACS,[c,d,e] Joseph S. Coselli, MD,[c,d,e] *and* George Geroulakos, MD,[a] *Athens, Greece; and Houston, Tex*

Outcome	No. of studies	Pooled rates, % (95% CIs)	Heterogeneity I^2 (%), *P* value	Publication bias Egger test (tau), *P* value
Mortality (in-hospital, all Crawford types)	30	11.26 (9.56-13.09)	82.8, .01	2.48, .02
Mortality (Crawford type I)	11	6.97 (3.75-10.90)	61.0, .01	1.24, .25
Mortality (Crawford type II)	12	10.32 (7.39-13.63)	65.8, .01	1.16, .27
Mortality (Crawford type II)	10	8.02 (6.37-9.81)	0.0, .45	1.32, .23
Mortality (Crawford type IV)	9	7.20 (4.19-10.84)	55.6, .02	1.49, .18
Cardiac events	10	4.41 (1.84-7.95)	96.4, .01	0.45, .66
Need for permanent dialysis	13	7.92 (5.34-10.92)	84.5, .01	0.42, .68
Reintervention due to hemorrhage	14	6.36 (3.78-9.50)	94.2, .01	0.90, .38
Stroke	13	3.11 (2.36-3.94)	52.9, .01	1.14, .27
Acute kidney injury	21	11.65 (8.78-14.68)	93.4, .01	0.12, .91
Bowel ischemia	5	1.72 (0.81-2.92)	72.9, .01	3.79, .03
Paraparesis	14	3.61 (2.25-5.25)	86.8, .01	−1.11, .29
Paraplegia	23	5.00 (4.36-5.68)	23.6, .15	0.95, .35
Respiratory complications	16	23.01 (14.73-32.49)	98.5, .01	−1.03, .32
Spinal cord ischemia	28	8.26 (6.95-9.67)	76.0, .01	−1.67, .11

J Vasc Surg, 2018

EDITORIAL

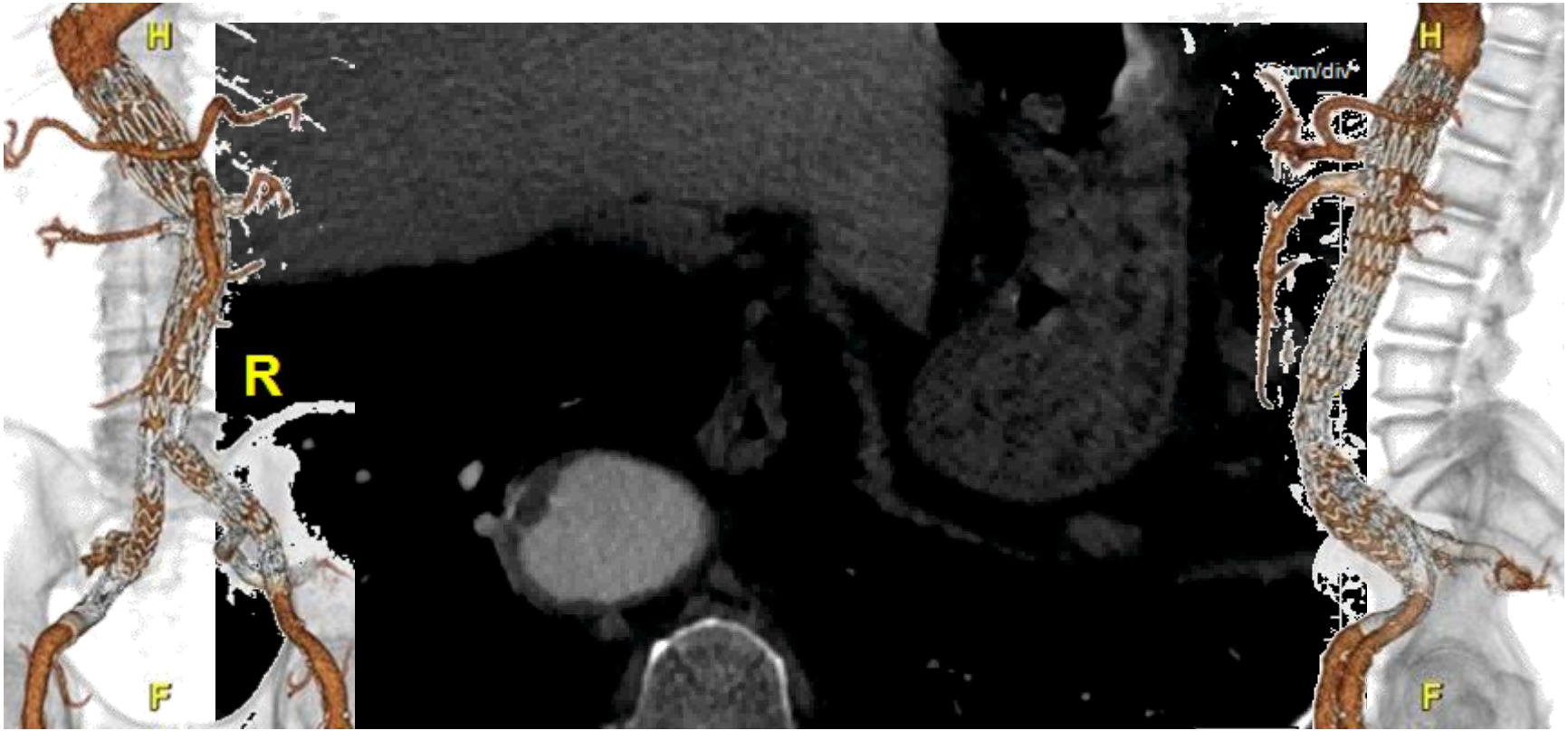
Fenestrated and branched endovascular aortic repair has reached a state of maturity

Stéphan Haulon, MD, PhD, *Lille, France*

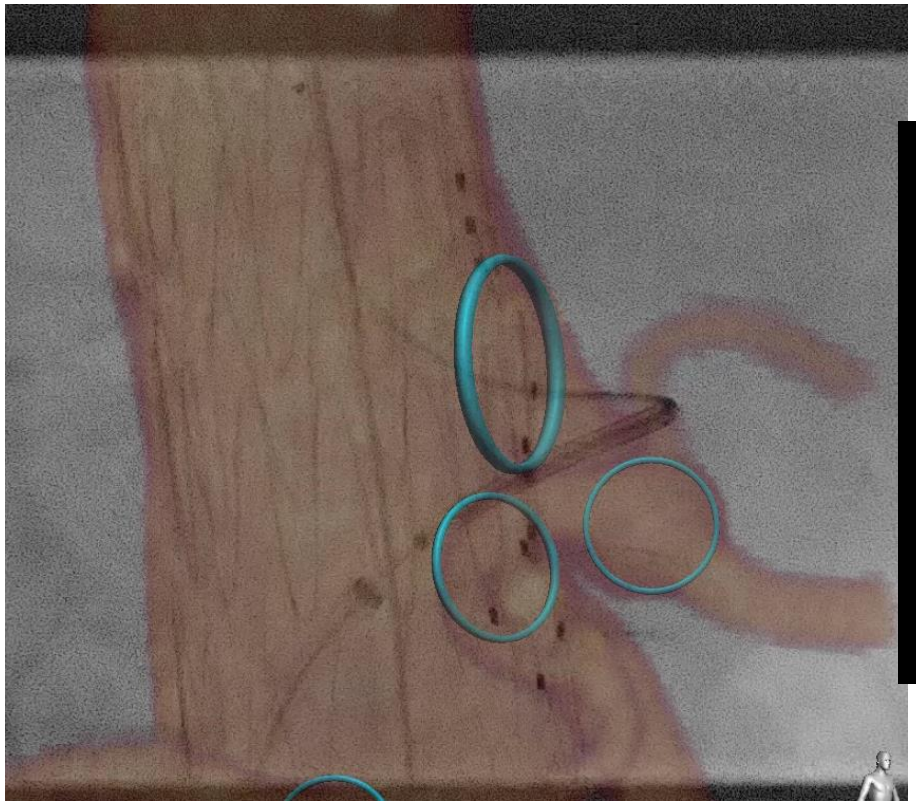
- Learning curve (patient selection, SCI prevention)
- Endograft design (increase fenestration for a durable fixation)
- Dedicated bridging stents
- Intraoperative imaging (fusion, cone-beam CT scan)

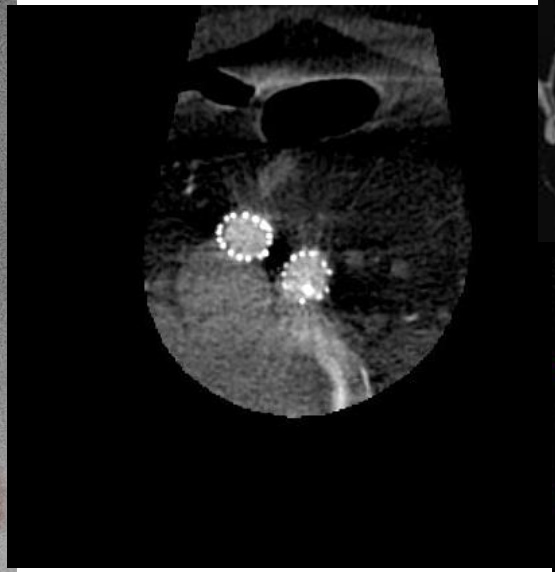
J Vasc Surg 2017

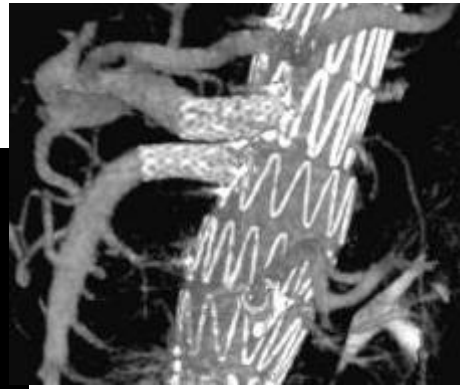
FEVAR in complex aortic anatomy: Type IV TAA and bilateral iliac aneurysms

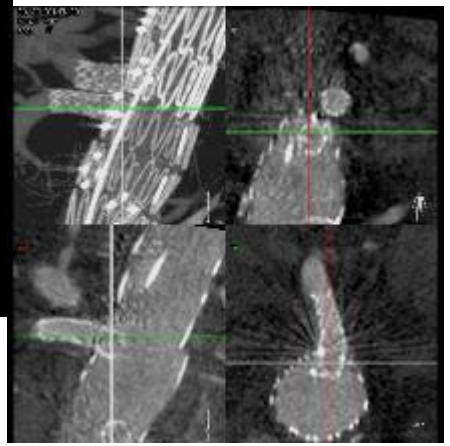


Custom-made f/b-EVAR: 3D fusion guidance and cone-beam CT scan







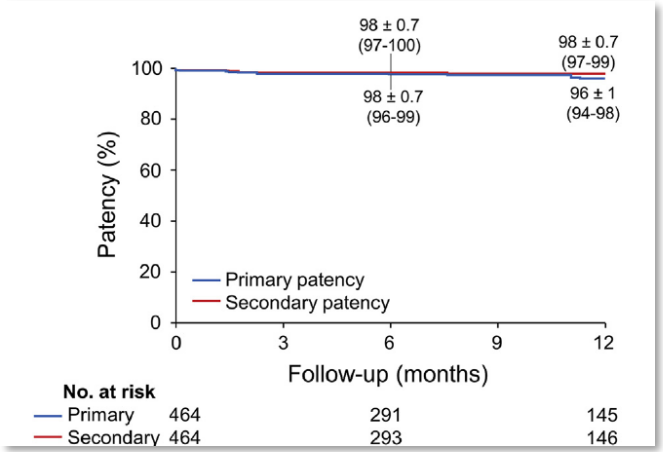


Prospective, nonrandomized study to evaluate endovascular repair of pararenal and thoracoabdominal aortic aneurysms using fenestrated-branched endografts based on supraceliac sealing zones

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

Variables	All (N = 127)	Pararenal (n = 47)	Type IV TAAA (n = 42)	Type I-III TAAA (n = 38)	*P* value
	No. (%) or mean ± standard deviation				
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

GFR, Glomerular filtration rate; *SCI*, spinal cord injury.

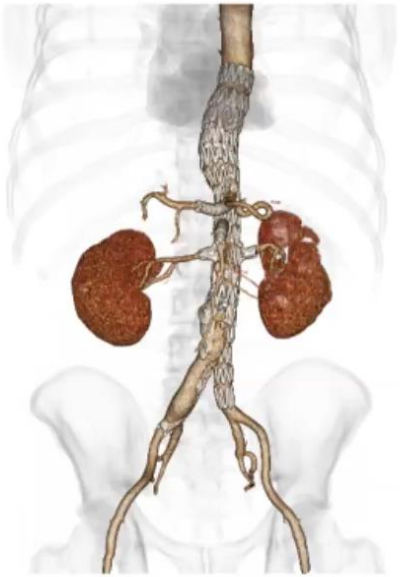


Conclusions: Endovascular repair of pararenal aortic aneurysms and TAAAs, using manufactured F-BEVAR with supra-celiac sealing zones, is safe and efficacious. Long-term follow-up is needed to assess the impact of four-vessel designs on device-related complications and progression of aortic disease. (J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

J Vasc Surg 2017

Custom-made endovascular solutions for thoraco-abdominal aortic disease

Custom-made endovascular solutions for thoraco-abdominal aortic disease



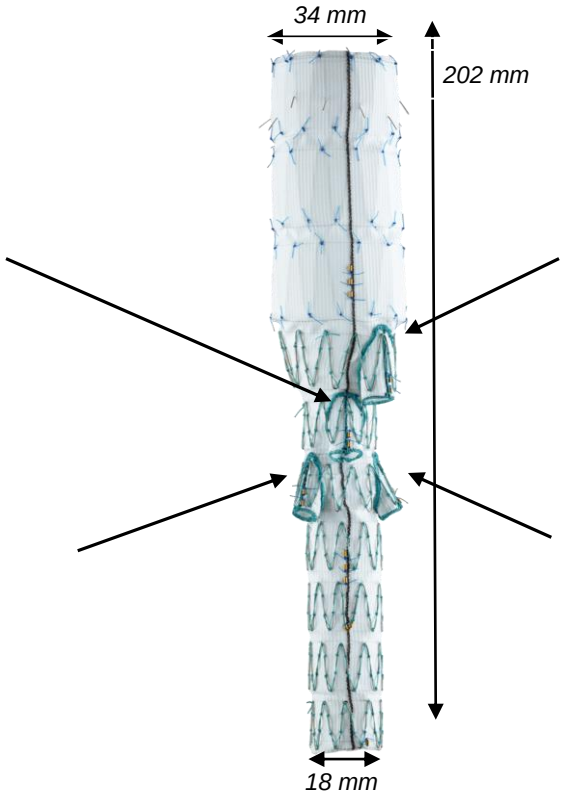
Zenith t-Branch off-the-shelf endograft

SMA Branch

Diameter: *8 mm*
Length: *18 mm*
Distance from proximal end of graft to distal end of branch: *117 mm*
Clock: *12:00*

Right Renal Branch

Diameter: *6 mm*
Length: *18 mm*
Distance from proximal end of graft to distal end of branch: *135 mm*
Clock: *10:00*



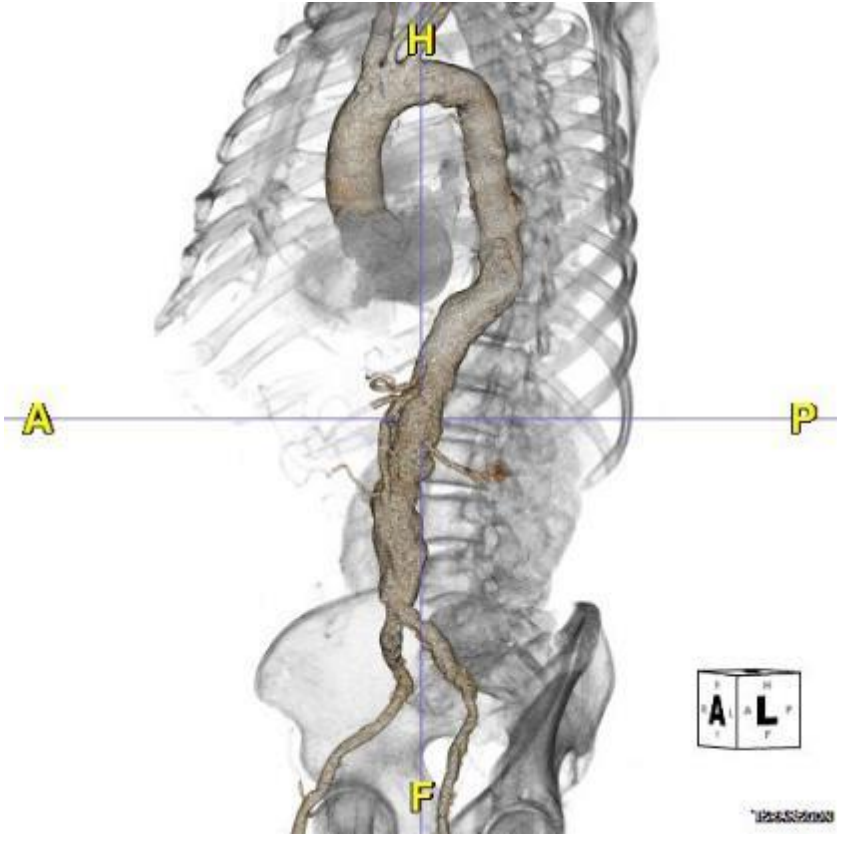
Celiac Branch

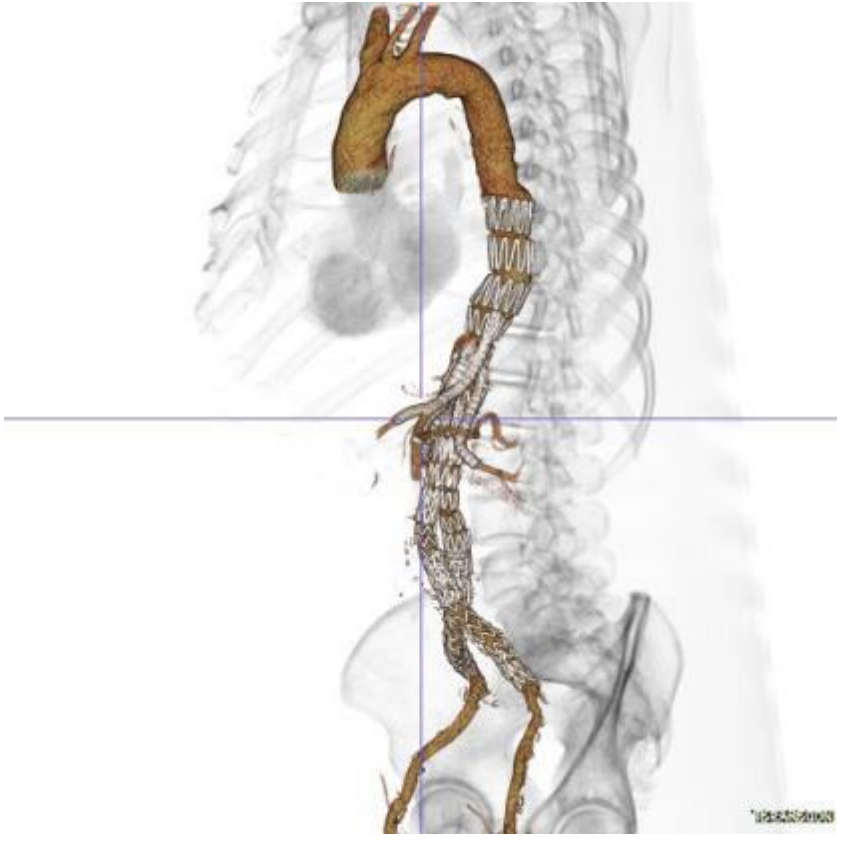
Diameter: *8 mm*
Length: *21 mm*
Distance from proximal end of graft to distal end of branch: *99 mm*
Clock: *1:00*

Left Renal Branch

Diameter: *6 mm*
Length: *18 mm*
Distance from proximal end of graft to distal end of branch: *135 mm*
Clock: *3:00*

Off-the-shelf endovascular solutions for thoraco-abdominal aortic disease

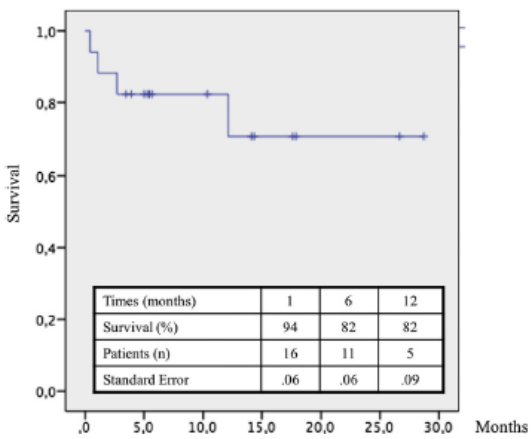


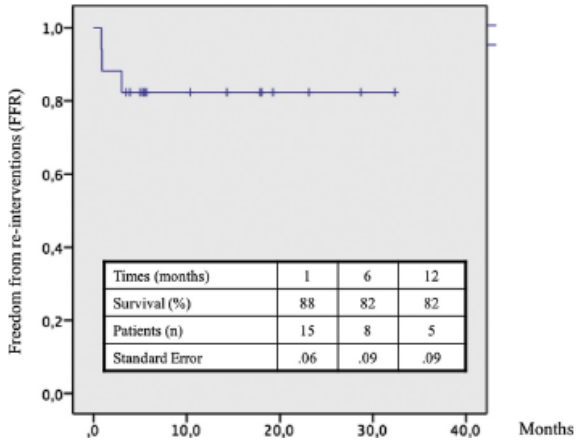


Off-the-shelf multibranched endograft for urgent endovascular repair of thoracoabdominal aortic aneurysms

Enrico Gallitto, MD, PhD,[a] Mauro Gargiulo, MD,[a] Antonio Freyrie, MD,[b] Rodolfo Pini, MD,[a] Chiara Mascoli, MD,[a] Stefano Ancetti, MD,[a] Gianluca Faggioli, MD,[a] *and* Andrea Stella, MD,[a] *Bologna and Parma, Italy*

- 17 pts: type II (47%), III (29%), IV (24%) TAAAs
- 4 contained TAAA rupture(24%); 4 symptomatic TAAA (24%); 9 TAAA diameter >8 cm, (52%)
- 15 patients (88%) needed adjunctive intraoperative procedures
- Technical success: 82%
- Spinal cord ischemia: 6%
- Renal function worsening: 25%
- 30-day mortality: 6%





Conclusions: The off-the-shelf multibranched endograft is a safe and effective therapeutic option for urgent total endovascular TAAA repair for which a custom-made endograft is not obtainable in due time. However, the complex anatomy of these aneurysms needs a number of adjunctive and complex intraoperative procedures to achieve a durable repair. (J Vasc Surg 2017;66:696-704.)

J Vasc Surg 2017

Standard "off-the-shelf" multibranched thoracoabdominal endograft in urgent and elective patients with single and staged procedures in a multicenter experience

Roberto Silingardi, MD,[a] Stefano Gennai, MD,[a] Nicola Leone, MD,[a] Mauro Gargiulo, MD,[b] Gianluca Faggioli, MD,[b] Piergiorgio Cao, MD, FRCS,[c] Fabio Verzini, MD, PhD, FEBVS,[d] Arnaldo Ippoliti, MD,[e] Nicola Tusini, MD,[f] Carmelo Ricci, MD,[g] Michele Antonello, MD, PhD,[h] Roberto Chiesa, MD,[i] Enrico Maria Marone, MD,[j] Nicola Mangialardi, MD,[k] Francesco Speziale, MD,[l] Gian Franco Veraldi, MD,[m] Stefano Bonardelli, MD,[n] *and* Luigi Marcheselli, BA,[o] on behalf of the Italian mbEVAR study group,* *Modena, Bologna, Rome, Perugia, Reggio Emilia, Siena, Padua, Milano, Pavia, Verona, and Brescia, Italy*

Outcomes	All (N = 73)	Elective (n = 41 [56%])	Urgent/emergent (n = 32 [44%])	*P* value
Thirty-day outcomes				
Mortality	3 (4)	—	3 (9)	.080
Branch occlusion or stenosis	3/268 (1)	2/154 (1)	1/114 (1)	1.000
Endoleak				
Ib	1 (1)	—	1 (3)	.438
II	1 (1)	1 (2)	—	1.000
Reinterventions	5 (7)	3 (7)	2 (6)	1.000
Follow-up outcomes				
Mortality	86%	96%	69%	<.001
Branch occlusion or stenosis	3/254 (1)	0/152 (0)	3/102 (3)	.064
Endoleak				
II	97%	95%	100%	.273
III	97%	100%	88%	.105
Reinterventions	83%	87%	72%	.444

Branch occlusion is the No. of occluded branches/total branches in follow-up. Mortality, endoleak, and reinterventions were assessed by Kaplan-Meier analysis at 24 months, and the *P* value was the result of the log-rank test.
Categorical data are given as counts (%).

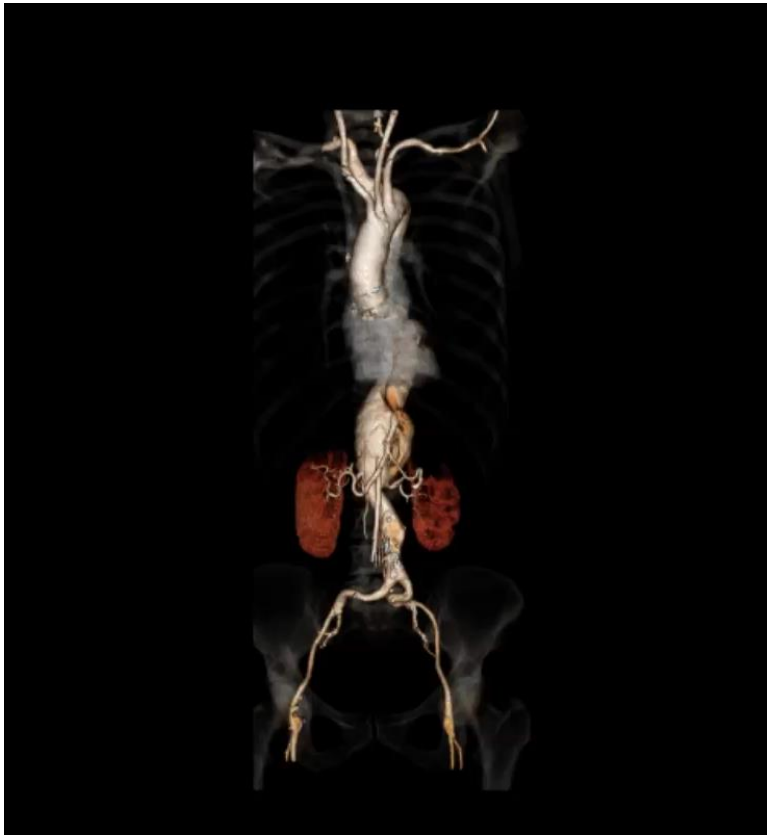
Events ≤30 days	All (N = 73)	Elective (n = 41 [56%])	Urgent/emergent (n = 32 [44%])	*P* value
SCI	2 (3)	2 (5)	—	.501
AKI	15 (21)	6 (15)	9 (28)	.243
Dialysis, temporary	3 (4)	—	3 (9)	.080
Dialysis, permanent	2 (3)	—	2 (6)	.189
Respiratory	7 (10)	2 (5)	5 (16)	.228
Cardiac	6 (8)	2 (5)	4 (12)	.394
Myocardial infarction	4 (5)	1 (2)	3 (9)	
Atrial fibrillation	2 (3)	1 (2)	1 (3)	
Neurologic	2 (3)	—	2 (6)	.189
Hematologic	1 (1)	1 (1)	—	.999
Infectious	3 (4)	1 (2)	2 (6)	.584

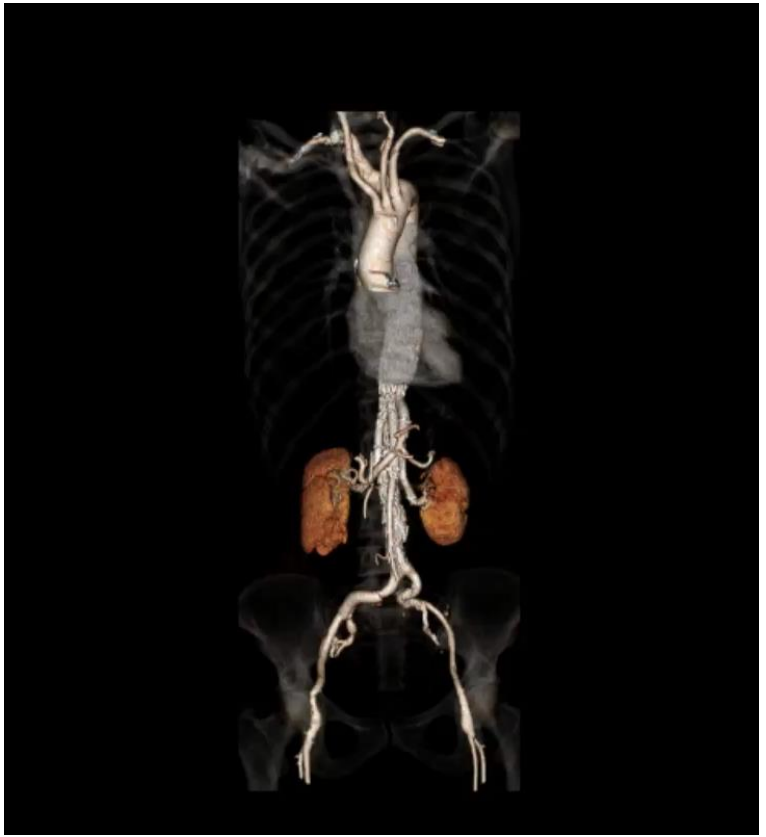
AKI, Acute kidney injury; *SCI*, spinal cord ischemia.
Respiratory encompasses respiratory failure (gas exchange failure), pneumonia, and acute pulmonary edema. Neurologic encompasses hemorrhagic stroke. The hematologic event is disseminated intravascular coagulation. Infectious encompasses systemic infection and groin wound infections.
Categorical data are given as counts (%).

Conclusions: The first off-the-shelf multibranched endograft seems safe in both urgent/emergent and elective settings. The staged surgical approach appears to positively influence overall survival. This unique device and its operators will usher in a new treatment paradigm for TAAA repair. (J Vasc Surg 2018;67:1005-16.)

J Vasc Surg 2018

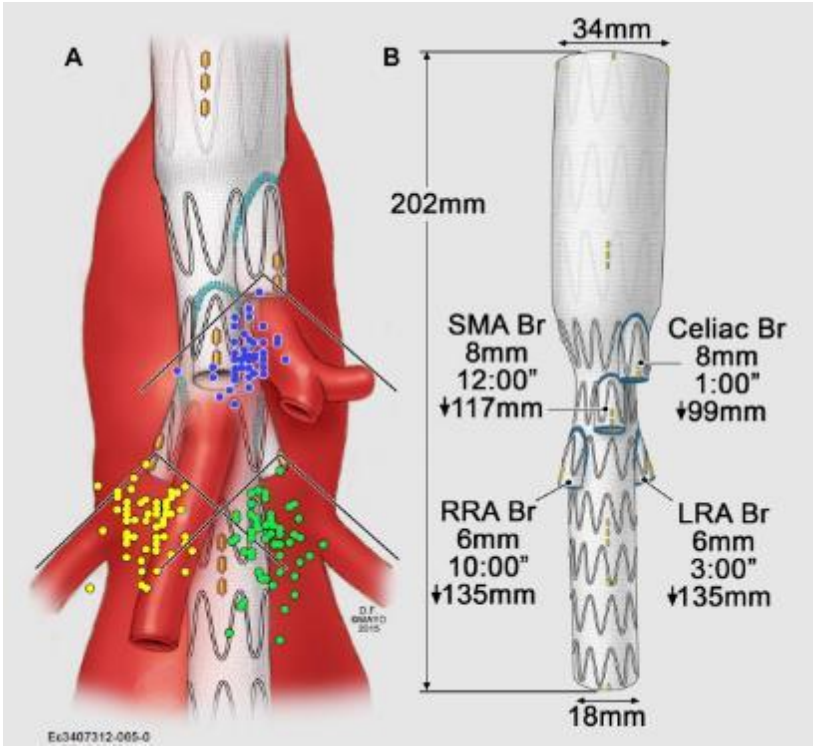
Off-the-shelf endovascular solutions for thoraco-abdominal aortic disease





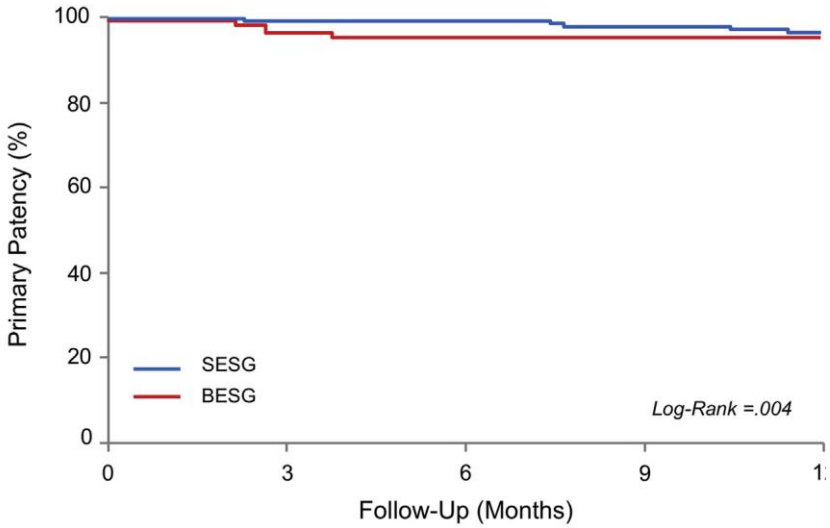
Branches vs fenestrations in endoTAAA: factors affecting decision making

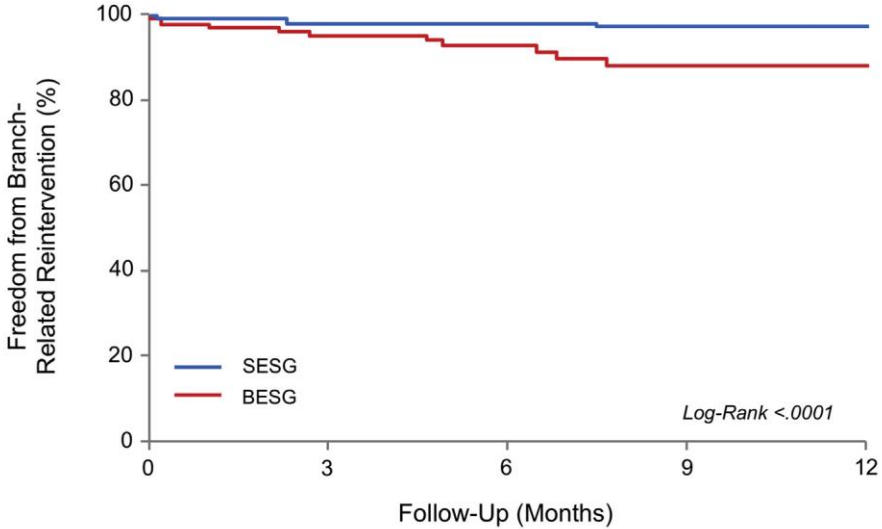
- Aortic diameter at visceral segment
  (aneurysm extension)
- Renal arteries take-off
  (upward vs downward)
- Spinal cord protection
  (staged vs simultaneous)
- Time of repair
  (urgent vs elective)



Outcomes of directional branches using self-expandable or balloon-expandable stent grafts during endovascular repair of thoracoabdominal aortic aneurysms

Emanuel R. Tenorio, MD, PhD, Jussi M. Kärkkäinen, MD, PhD, Bernardo C. Mendes, MD, Randall R. DeMartino, MD, Thanila A. Macedo, MD, Alisa Diderrich, RN, Jan Hofer, RN, *and* Gustavo S. Oderich, MD, *Rochester, Minn*

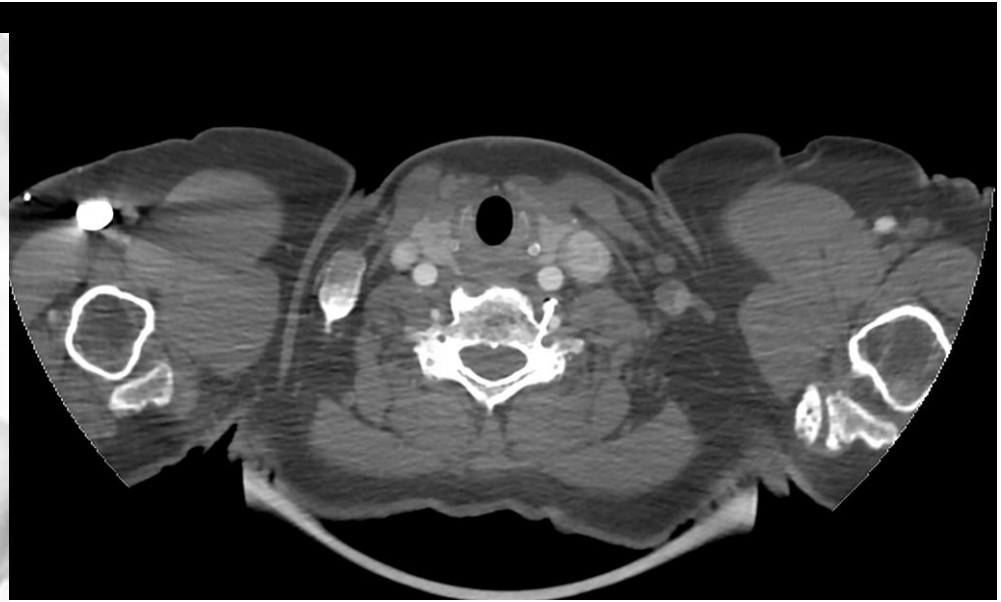




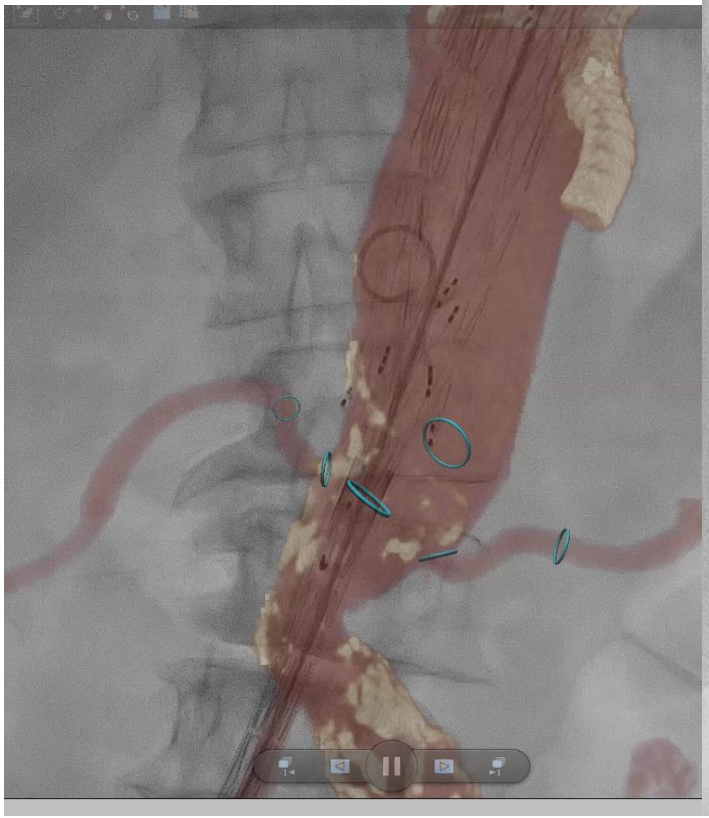
Conclusions: Directional branches were associated with high technical success and low rates of stent occlusion, independent of stent type. However, primary patency, freedom from TAI, and freedom from type IC or type IIIC endoleaks was lower for BESGs compared with SESGs.

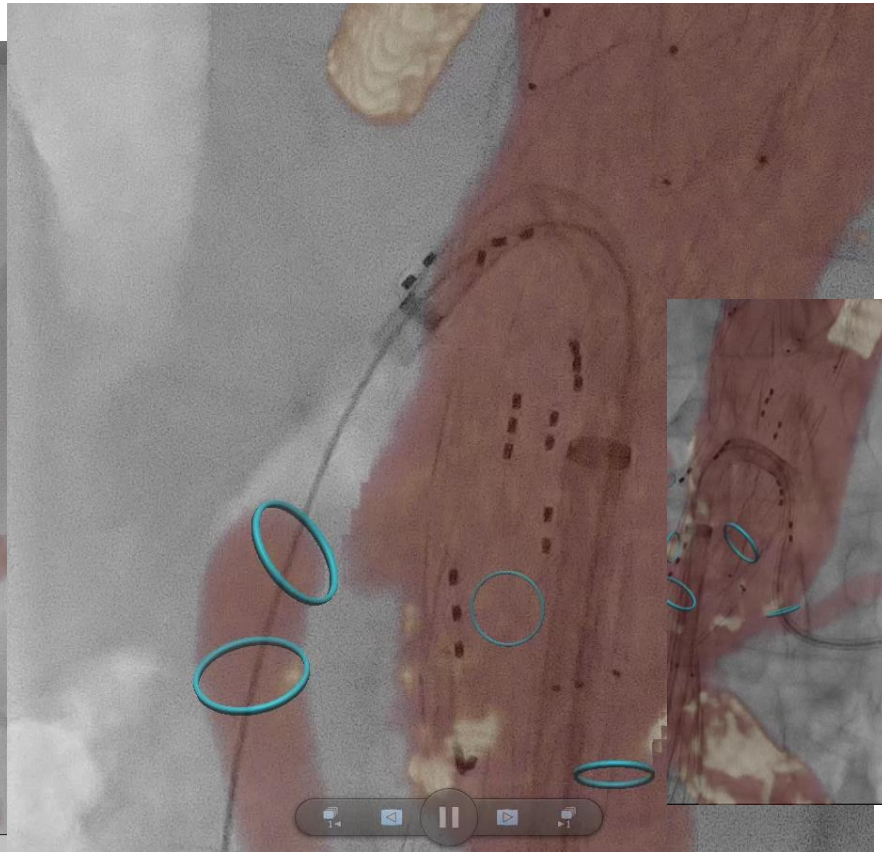
J Vasc Surg 2019

Endo management of complex TAAA repair



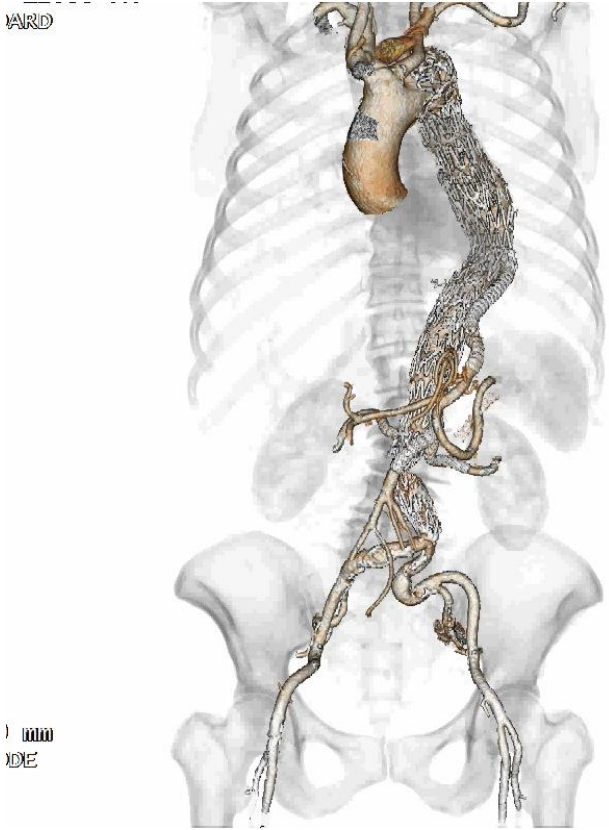
Bridging stent in complex bEVAR repair: a new and easiest way to branch target vessels





Bridging stent in complex bEVAR repair: a new and easiest way to branch target vessels

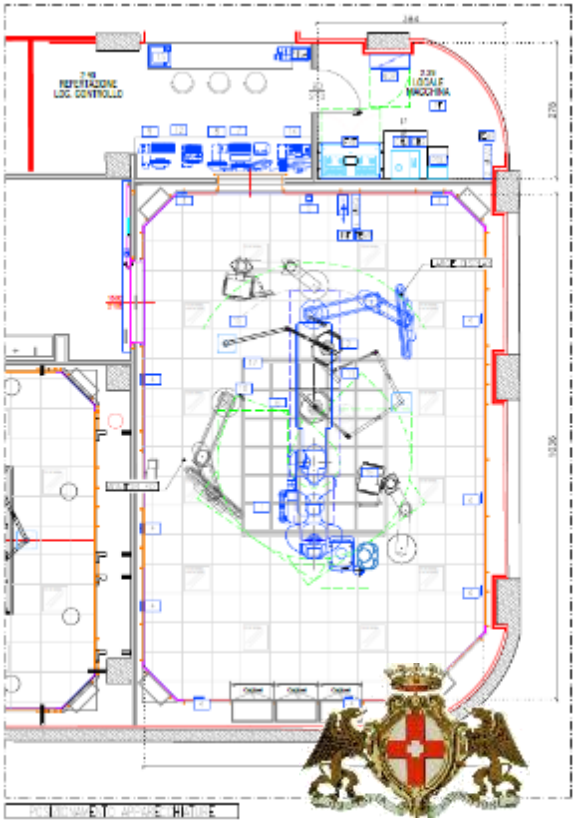
Bridging stent in complex bEVAR repair: a new and easiest way to branch target vessels



Are you ready for primetime?

Total endoTx for complex aortic disease: augmented reality-assisted repair

Technical environment: the new surgical theater in Ospedale Policlinico San Martino – HSM Genoa

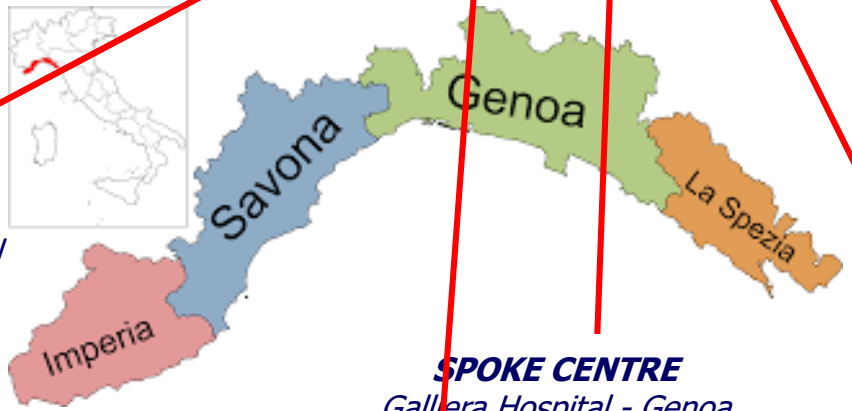


Aortic arch and thoraco-abdominal aortic disease: Liguria organization

HUB CENTRE
Ospedale San Martino - Genoa

NON SPOKE CENTRE
Imperia Hospital

NON SPOKE CENTRE
Villa Scassi Hospital Genoa



SPOKE CENTRE
Gallliera Hospital - Genoa

SPOKE CENTRE
La Spezia Hospital

SPOKE CENTRE
Santa Corona di Pietra Ligure Hospital

Editor's Choice — Current Options and Recommendations for the Treatment of Thoracic Aortic Pathologies Involving the Aortic Arch: An Expert Consensus Document of the European Association for Cardio-Thoracic Surgery (EACTS) & the European Society for Vascular Surgery (ESVS)

1.4.1. Aortic team definition. The WC advocates that an aortic team should be closely involved from diagnosis to treatment and finally follow-up and should be led by members from cardiac and vascular surgery in collaboration with anaesthesiology, cardiology, radiology and genetics. A major advantage of surgery as the leading specialty is that surgeons have experience linking radiographic findings to tissue quality, which is a major component when opting for open surgery or endovascular treatment.

Recommendation 1		
Decision making for the treatment of aortic arch pathologies by an aortic team is recommended		
Class	Level	References
I	C	-

Recommendation 2		
Centralization of care for aortic arch pathologies is recommended		
Class	Level	References
I	C	-

Recommendation 3		
Treatment of elective aortic arch pathology is recommended to be performed in specialized centres providing open and endovascular cardiac and vascular surgery on site only		
Class	Level	References
I	C	-

Eur J Vasc Endovasc Surg (2019)

IL BATTITO DEL CUORE

Campagna di sensibilizzazione per la prevenzione delle malattie cardiovascolari