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F/EVAR Versus Ch/EVAR For Juxtarenal AAAs: How Do The Results Compare After Up To 8 Years Follow-Up In A Real World Experience

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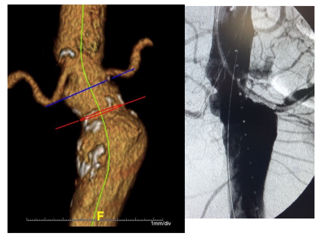
National Autonomous University of Mexico
Hoispital Medica Sur, Mayo Clinic Network

Yuxtarrenal y Pararrenal AAA

- 15-20% of all AAAs



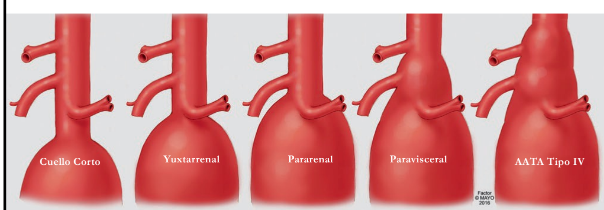
Catheterization and Cardiovascular Interventions 75:1111–1115 (2010)

Case Reports

"The Chimney Graft"—A Simple Technique for Endovascular Repair of Complex Juxtarenal Abdominal Aortic Aneurysms in No-Option Patients

Suhail Allaqaband, MD, M. Fuad Jan, MBBS, MD, and Tanvir Bajwa, MD

Mayo Clinic Classification of COMPLEX Abdominal Aortic Aneurysms



Anatomy of the hostile neck

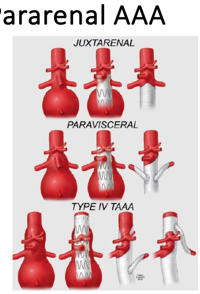
It is known to affect the ability to seal between the device and the aorta

- ✓ Neck diameter >28-30 mm
- ✓ Neck angulation >60°
- ✓ Neck length <15 mm or < 10 mm
- ✓ Circumferential neck thrombus ≥2 mm thick
- ✓ Proximal calcific neck ≥50%
- ✓ Reverse Taper

Treatment for Juxtarrenal-Pararenal AAA

OPTIONS:

1-Open surgery
2-Fenestrated/Branched
3-Parallel graft (chEVAR)



Current Reality for the Treatment of AAA Juxta/Pararenal in Mexico

México 2024

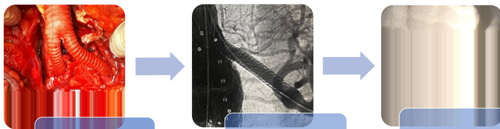
Open surgery

f/EVAR PMEG

f-EVAR (crossed out)

Parallel grafts ch/EVAR

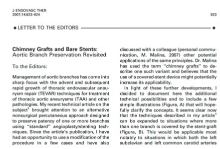
Treatment Options for Juxtarenal AAA at the National Medical Center of Mexico-ISSSTE

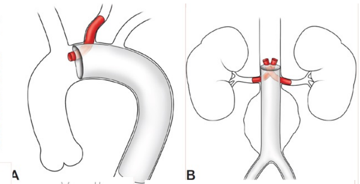


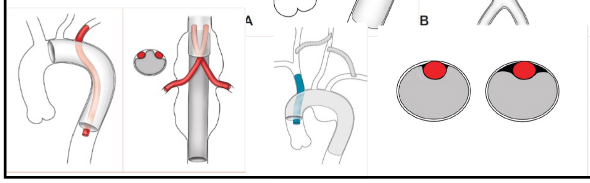
Before 2010

Between 2010 - 2019

After 2019







EDITORIAL COMMENTARY

Parallel Grafts in Perspective: Definitions and a New Classification

Frank J. Criado, MD, FACS, FSVM, Sira Duson, MD
From MedStar Union Memorial Hospital, Baltimore, Maryland.

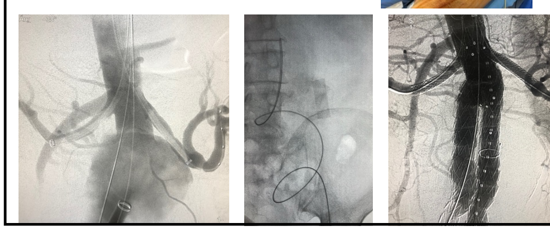
Table 2. Classification of parallel grafts.

Type I (a and b)	Parallel graft running between the native aortic lumen and a target branch
Type II	Long parallel graft running from endograft lumen into target branch and including a sandwiched segment of >5 cm in length

Table 1: Historical milestones for parallel grafts

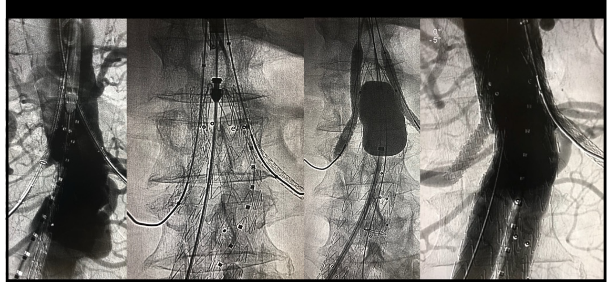
2001	Greenberg *et al*	First chimney (renal artery)
2003	Criado *et al*	First arch branch chimney (left carotid artery)
2004	Larzon *et al*	First planned arch branch chimney (left carotid artery)
2007	Criado *et al*	Suggested/illustrated use of longer chimneys
2008	Malina *et al*	Popularisation of the term "chimneys"
2008	Lachat-Mayer *et al*	Periscope graft (visceral/renal arteries)
2008	Lobato *et al*	Sandwich graft procedure (hypogastric artery)
2009	Lobato *et al*	Sandwich graft procedure (visceral arteries)
2010	Kasirajan *et al*	Two inverted bifurcated abdominal stent grafts plus multiple thoracoabdominal long conduits coming antegrade from the iliac limbs
2010	Donas *et al*	Report of first clinical series (>10 patients) in treatment of juxtarenal aneurysms
2012	Mestres *et al*	In vitro testing of best device combinations for chEVAR
2013	Donas *et al*	Publication of clinical results confirming Mestres *et al* findings
2015	Donas, Lee *et al*	Worldwide collected experience (PERICLES Registry) results published
2016	Donas, Torsello *et al*	PROTAGORAS Study as the first attempt to standardise the chimney technique
2017	Donas, Criado *et al*	Novel classification (based on the causative mechanisms) of type Ia endoleaks and persistent gutters following chEVAR aortic repair

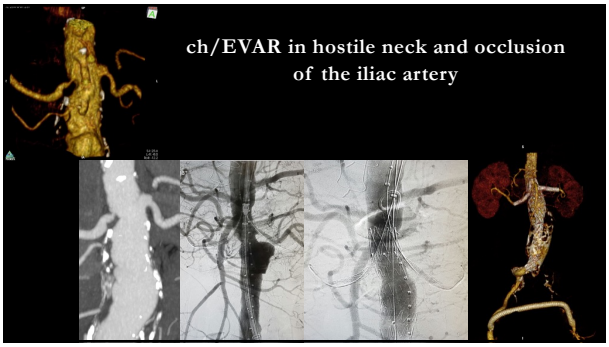
chEVAR in emergency cases (rAAA Juxtarenal)

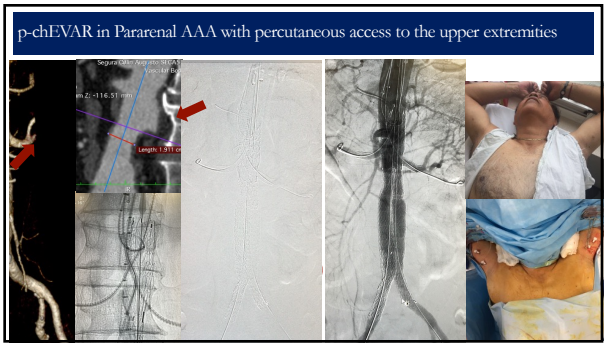


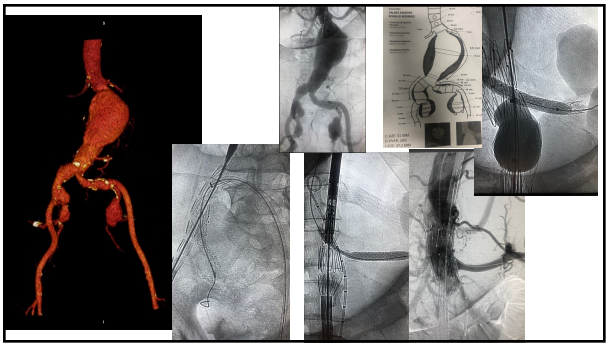
AAA Juxtarenal

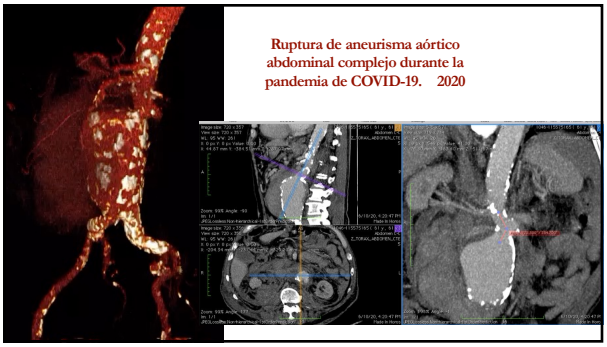
chEVAR on hostile neck

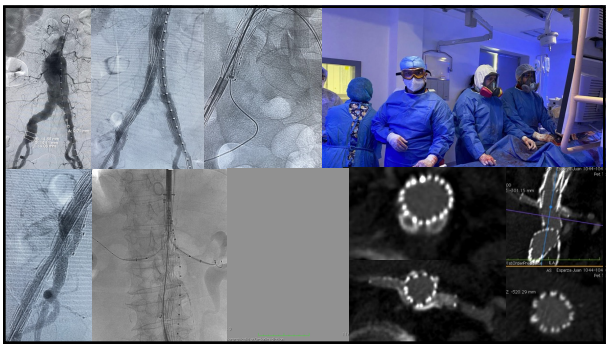


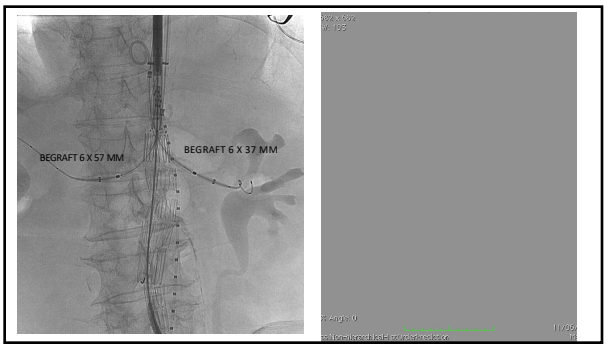

ch/EVAR in hostile neck and occlusion
of the iliac artery

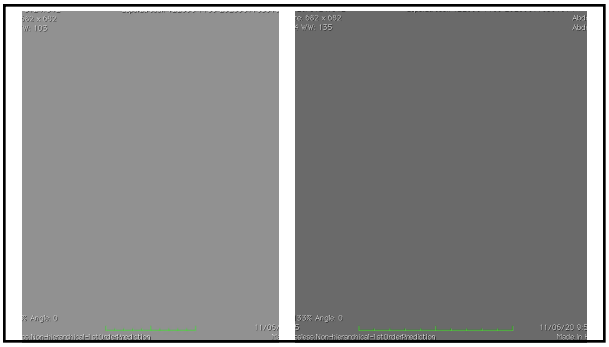

p-chEVAR in Pararenal AAA with percutaneous access to the upper extremities

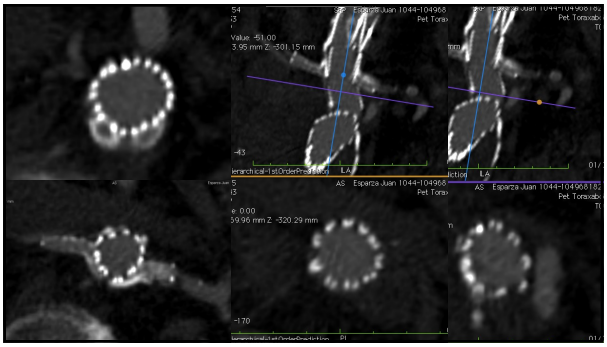


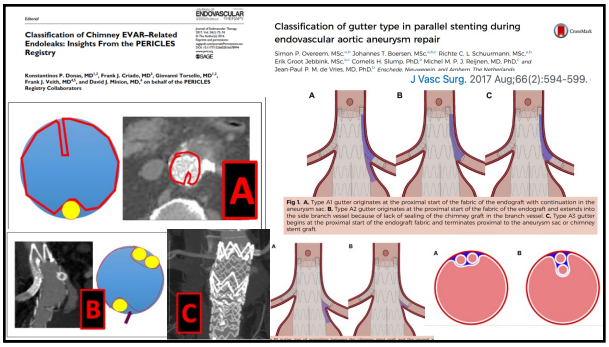

Ruptura de aneurisma aórtico
abdominal complejo durante la
pandemia de COVID-19. 2020

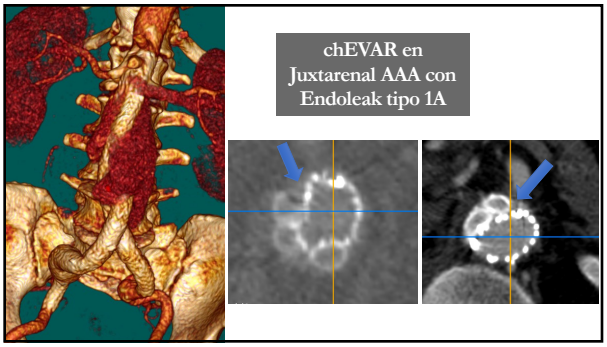


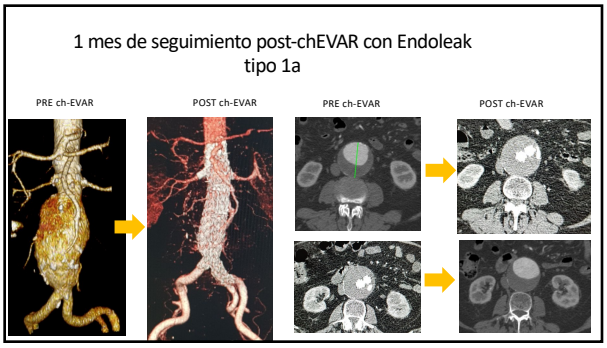

BEGRAFT 6 X 57 MM
BEGRAFT 6 X 37 MM

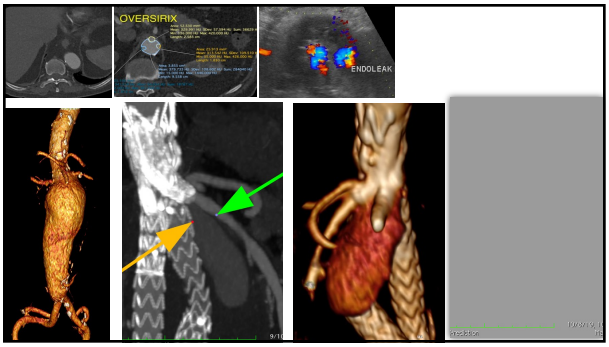





Classification of Chimney EVAR–Related Endoleaks: Insights From the PERICLES Registry
Classification of gutter type in parallel stenting during endovascular aortic aneurysm repair
J Vasc Surg. 2017 Aug;66(2):594-599.
A
B
C


chEVAR en Juxtarenal AAA con Endoleak tipo 1A


1 mes de seguimiento post-chEVAR con Endoleak tipo 1a
PRE ch-EVAR
POST ch-EVAR
PRE ch-EVAR
POST ch-EVAR

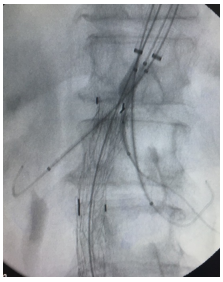


ch-EVAR demographics

	N=38	%
Age	77 (56-91)	
Male	28	73
Coronary artery disease	20	52
EPOC	17	44
History of smoking	27	71
Diabetes	9	26
Hypertension	33	86
Cerebrovascular disease	4	10
Chronic kidney disease	10	26
Dialysis	1	2
Hyperlipidemia	28	73

ch-EVAR demographics

		%
Juxtarrenal AAA	38	76
Pararenal AAA	5	13
Suprarenal AAA	3	7
Toracoabdominal AA	1	2.7
Disección aortica	0	0
AAA roto	3	8

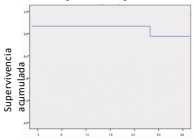


ch-EVAR demographics

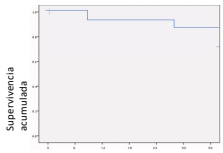
TARGET ARTERY	93	%
Arteria renal	80	73
SMA	21	52
CT	4	44
Chimney	37	97
Periscope	1	3
Number of PG's placed	38 pts	
1	7	18
2	10	26
3	18	47
4	3	8

Follow-up ch-EVAR

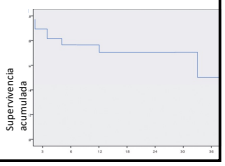
PrimaryPatency



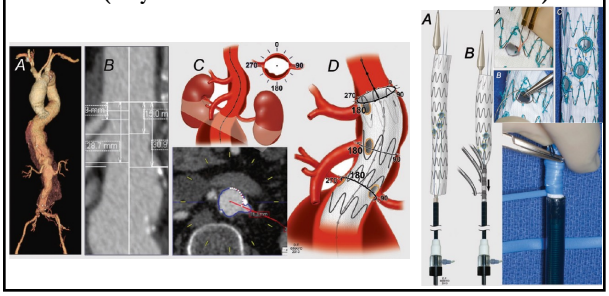
Re-intervention-free survival



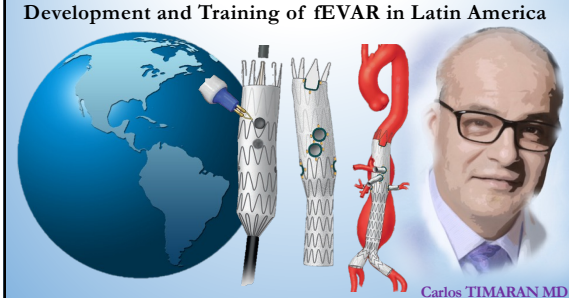
Overall survival



PGEM (Physician-Modified Endovascular Grafts)

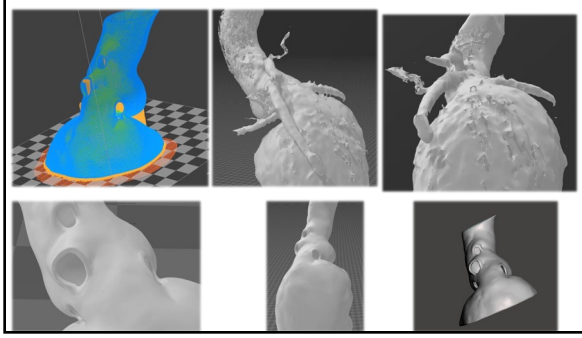


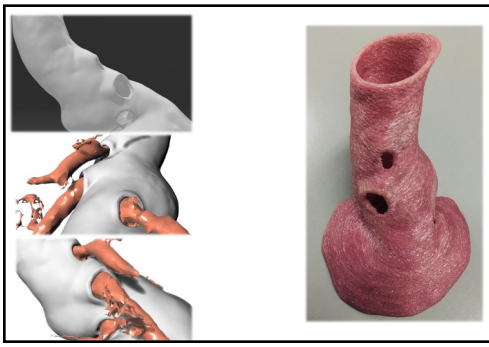
Development and Training of fEVAR in Latin America



Planning Table

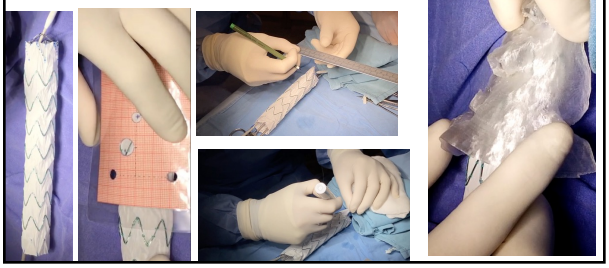
	Distancia	Hora reloj	Long arco	Dm Aórtico	Dm vaso	Nivel	Vista	Bifurcación
T. Celiaco	0	12: 00	0	27 mm	6 mm	L 1 (bord sup)	LAO 70	-
AMS	17 mm	11: 15	- 6 mm	36 mm	10 mm	L 1	LAO 70	-
Renal izq (alta)	33 mm	02: 30	+ 21 mm	25 mm	5 mm	L 2 (bord sup)	CC 6, LAO 14	-
Renal der (baja)	33 mm	10: 00	- 16 mm	25 mm	5 mm	L 1 (bord sup)	AP, CC 10	-
Bifurcación	150 mm	-	-	23 mm	-	-	-	-
AFC D	9.5 MM	AIE D	7.5 MM					
AFC I	9 MM	AIE I	8.5 MM					



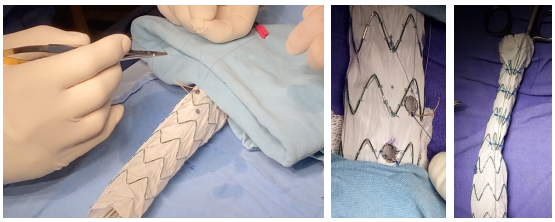


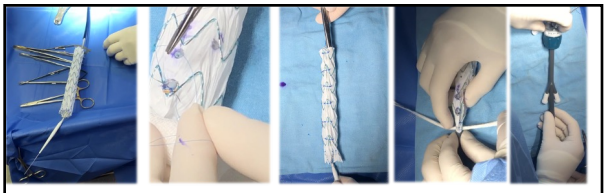
PGM (Physician-Modified Endovascular Grafts)

Back Table



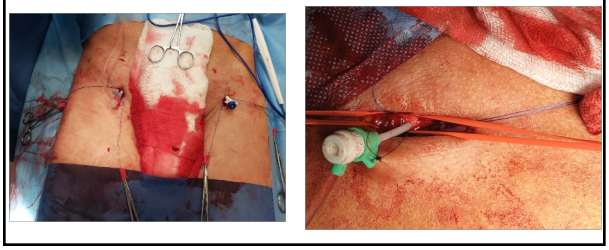
Back Table

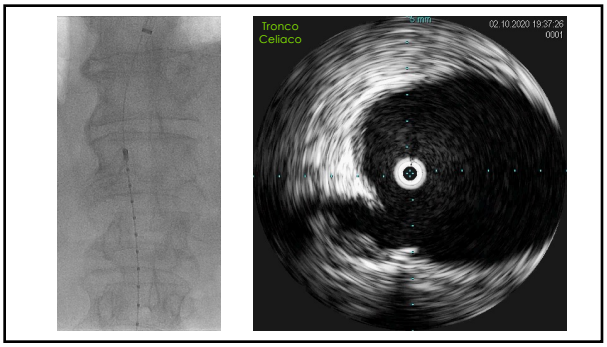


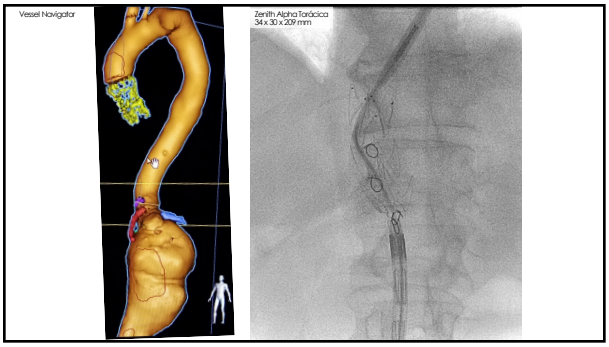


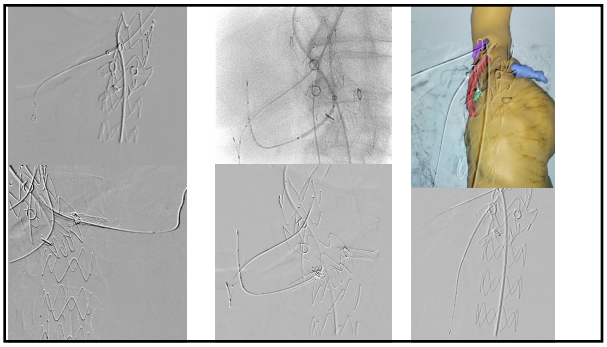
	Distancia	Hora Reloj	Long. Arco	Dm. Aórtico	Dm. Vaso	Nivel	Vista
T. Celiaco	0	12 : 00	0	27 mm	6 mm	L1 (borde sup.)	LAO 70
AMS	17 mm	11: 15	- 6 mm	36 mm	10 mm	L 1	LAO 70
Renal Izq.	33 mm	02 : 30	+ 21 mm	25 mm	5 mm	L1 - L2	CC 6, LAO 14
Renal Der. (Más baja)	33 mm	10 : 00	- 16 mm	25 mm	5 mm	L2 (borde sup.)	AP, CC 10
Bifurcación	192 mm	-	-	23 mm	-	-	-

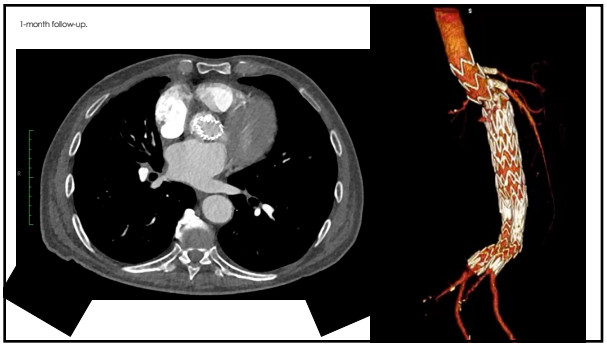
Procedure

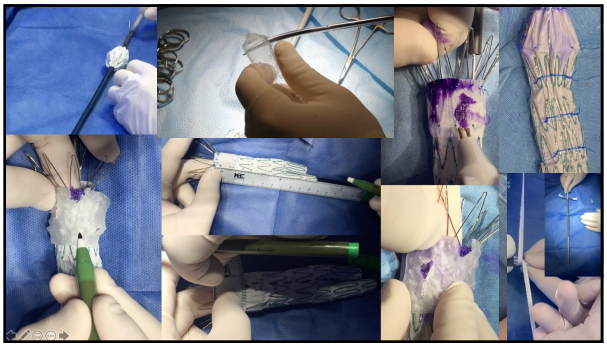


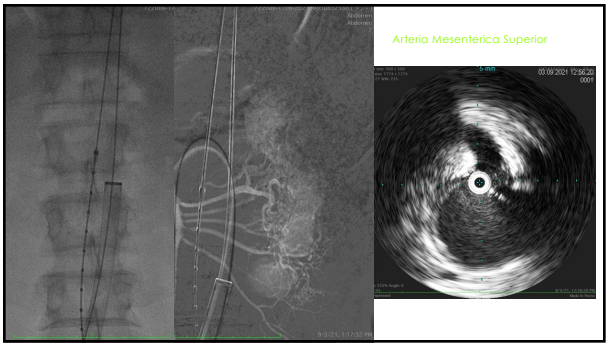


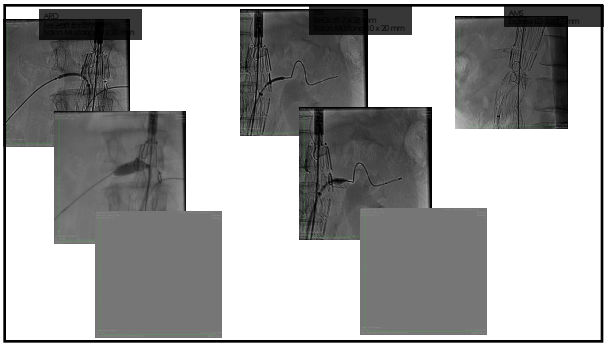

Vessel Navigator
Zenith Alpha Torácica
34 x 30 x 209 mm

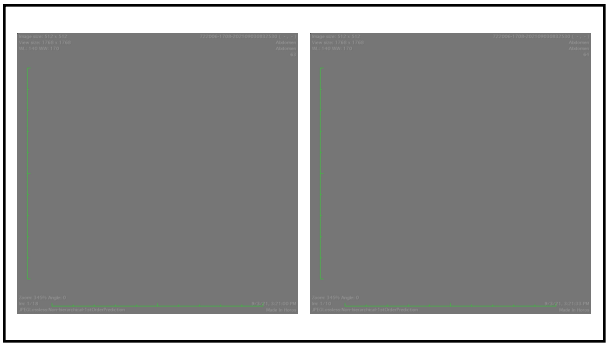


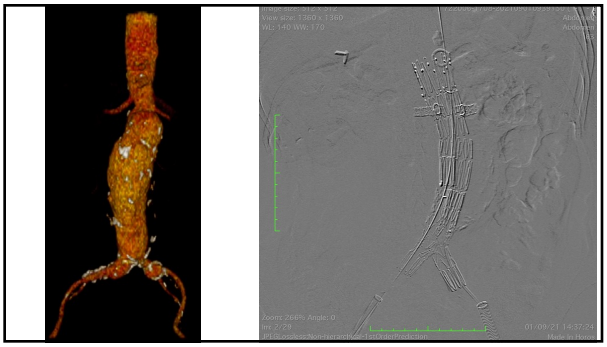

1-month follow-up.

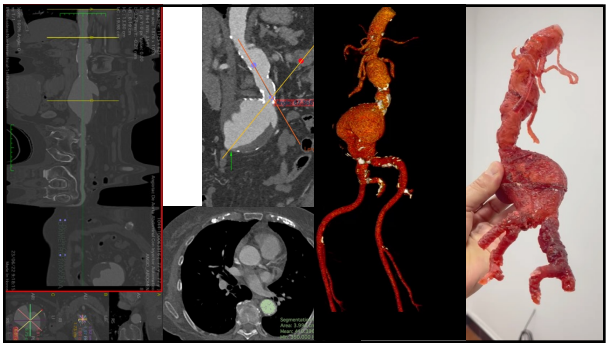


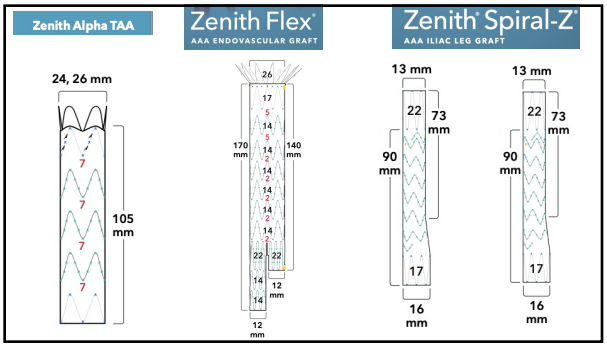

Arteria Mesenterica Superior

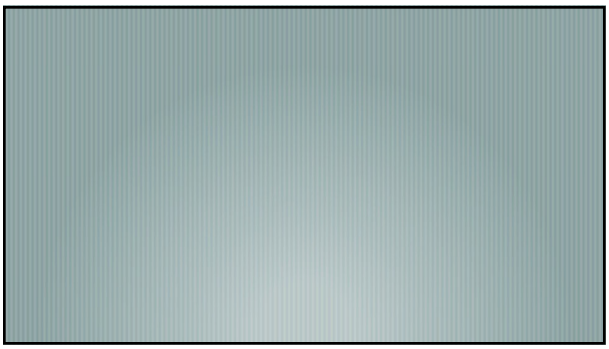


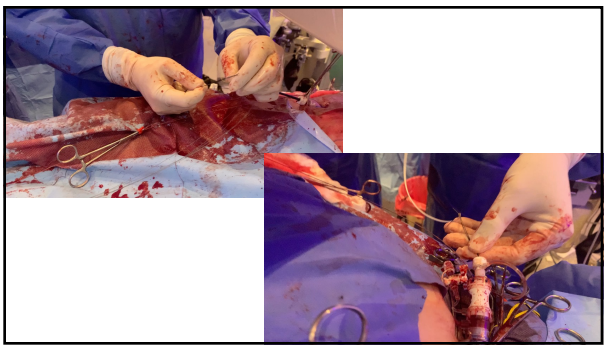


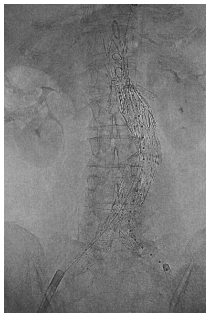


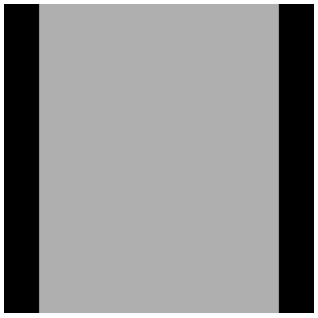



Zenith Alpha TAA
24, 26 mm
105 mm
Zenith Flex
AAA ENDOVASCULAR GRAFT
170 mm
140 mm
12 mm
Zenith Spiral-Z
AAA ILIAC LEG GRAFT
13 mm
22
73 mm
90 mm
17
16 mm
13 mm
22
73 mm
90 mm
17
16 mm



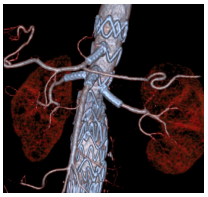






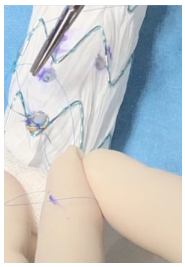
Datos demográficos f-EVAR

	N=25	%
Age	75 (60-90)	
Male gender	29	76
Coronary artery disease	9	50
COPD	2	11
History of smoking	16	64
Diabetes	2	11
Hypertension	9	50
Cerebrovascular disease	1	6
Chronic kidney disease	8	32
Dialysis	0	0
Hyperlipidemia	12	48



Datos demográficos f-EVAR

		%
Juxtarrenal AAA	13	52
Pararenal AAA	7	28
Suprarenal AAA	2	8
Toracoabdominal AA	2	2.7
Disección aortica	1	4
AAA roto	0	0

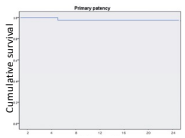


f-EVAR demographics

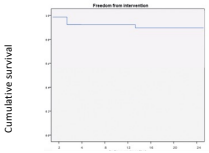
Target Vessel	93	%
Renal Artery	80	73
SMA	21	52
CT	4	44
Chimney	37	97
Periscope	1	3
Number PG's Placed	38 pts	
1	1	4
2	2	8
3	9	36
4	13	52

Follow up fEVAR (PMEG)

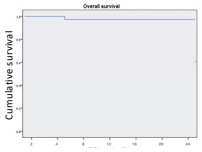
Primary patency



Re-intervention-free survival



Overall survival



Comparative results ch-EVAR vs fEVAR 5 years follow up

	ch-EVAR 38 pacientes	f-EVAR 35 pacientes	P Value
30 Day Mortality	4	2	0.001
12-month survival	90%	92%	NS
Technical Succes	92%	95%	NS
Renal Failure	3 (8%)	1 (4%)	NS
Persistent Dialysis	1 (2.6%)	0	NS
Endoleak Type IA	12 (31.5%)	0	0.0001
Endoleak Type II	15 (39%)	5 (20%)	NS
Endoleak Type III	3 (8%)	4 (16%)	NS
Fluoroscopy time (min)	65 min (60-75 min)	86 min (50-97 min)	NS
Contrast Material (ml)	360 ml	230 ml	NS
Estimated blood loss	250 ml	300 ml	NS

Conclusions

- f/EVAR should be the 1st treatment option when there are conditions to perform it.
- PMEG excelent durable option, simjple in expert hands.
- chEVAR can be performed on patients who are not suitable for surgery, emergency cases, with adequate and non-routine anatomy.
- There is a learning curve as for any surgical technique to achieve technical success.