

2023

11^{ème}

SÉMINAIRE de ARDIOLOGIE
INTERVENTIONNELLE de TROYES

01 & 02
AVRIL



SALLE DU CONSEIL MUNICIPAL
HOTEL DE VILLE de TROYES



ANÉVRISME DE L'AORTE THORACIQUE : L'intervention adaptée: TT endovasculaire



AP-HP.
Hôpitaux universitaires
Henri-Mondor

Eric Bergoend – P Desgranges

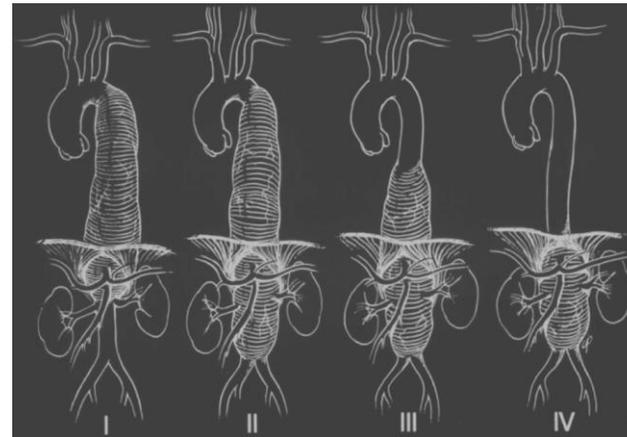
Hôpital Henri Mondor

Déclaration de conflits d'intérêts

- Aucun

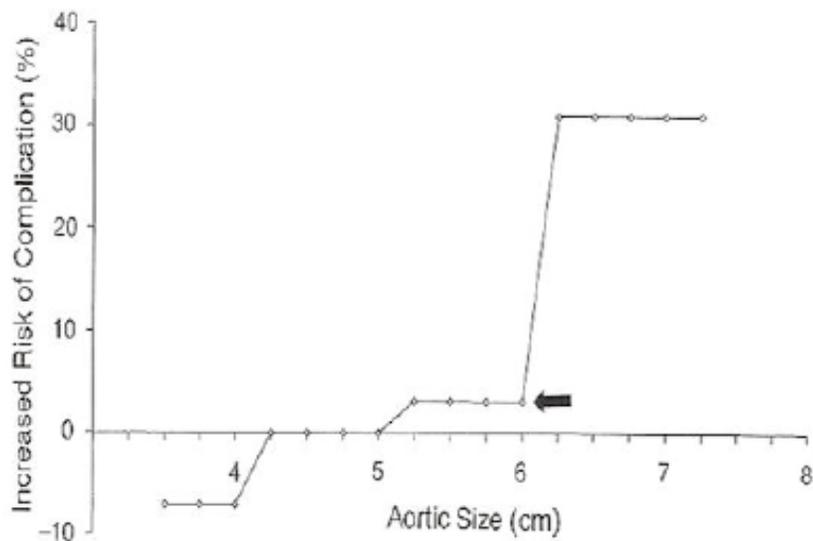
Anévrisme aorte thoracique

- Moins fréquent/AAA
- 95 % asymptomatique
- Complications: dissections - ruptures
- 20-54%: survie à 5 ans si non traité
- Localisation et extension :
- Ao As (50 %), Crosse (10%),
- Ao desc (40%), ATA(10%)

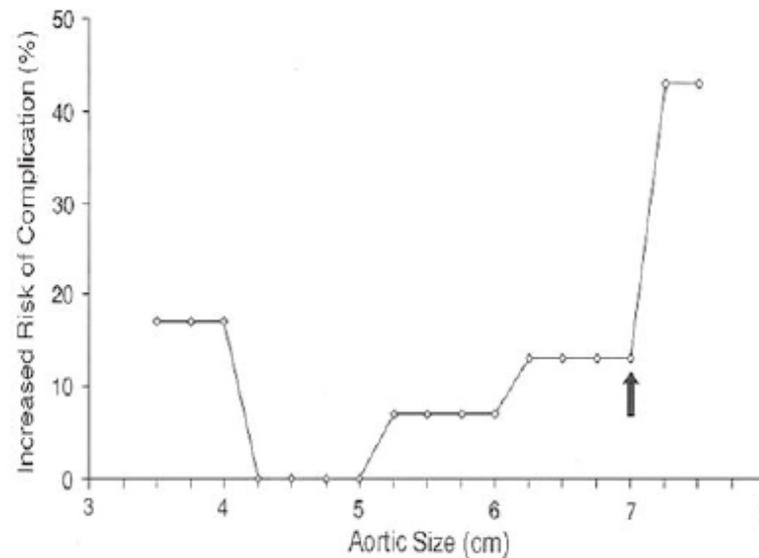


« HINGE POINTS »

- Ascending



- Descending



From Elefteriades , 2010

INDICATIONS

1° > 5,5 CM Ao as, >6 cm Ao desc

2° SYMPTOMATIQUE

3° EVOLUTIF > 1CM/AN

4° PLUS « AGRESSIFS »:

- MARFAN, Loey-Dietz

- Bicuspidie

- ATCD Familiaux de DISSECTION

AT: etiologies

- **Dégénératif /athérosclereux**
- **Dissection chronique/ulcère pénétrant**
- **Maladies tissus élastique**
- **Maladie inflammatoire**
- **Infectieux**
- **Post-traumatique**

Historique

**CHIRURGIE/DE BACKEY
1953**



**TEVAR/VOLODOS-DAKE
1994**



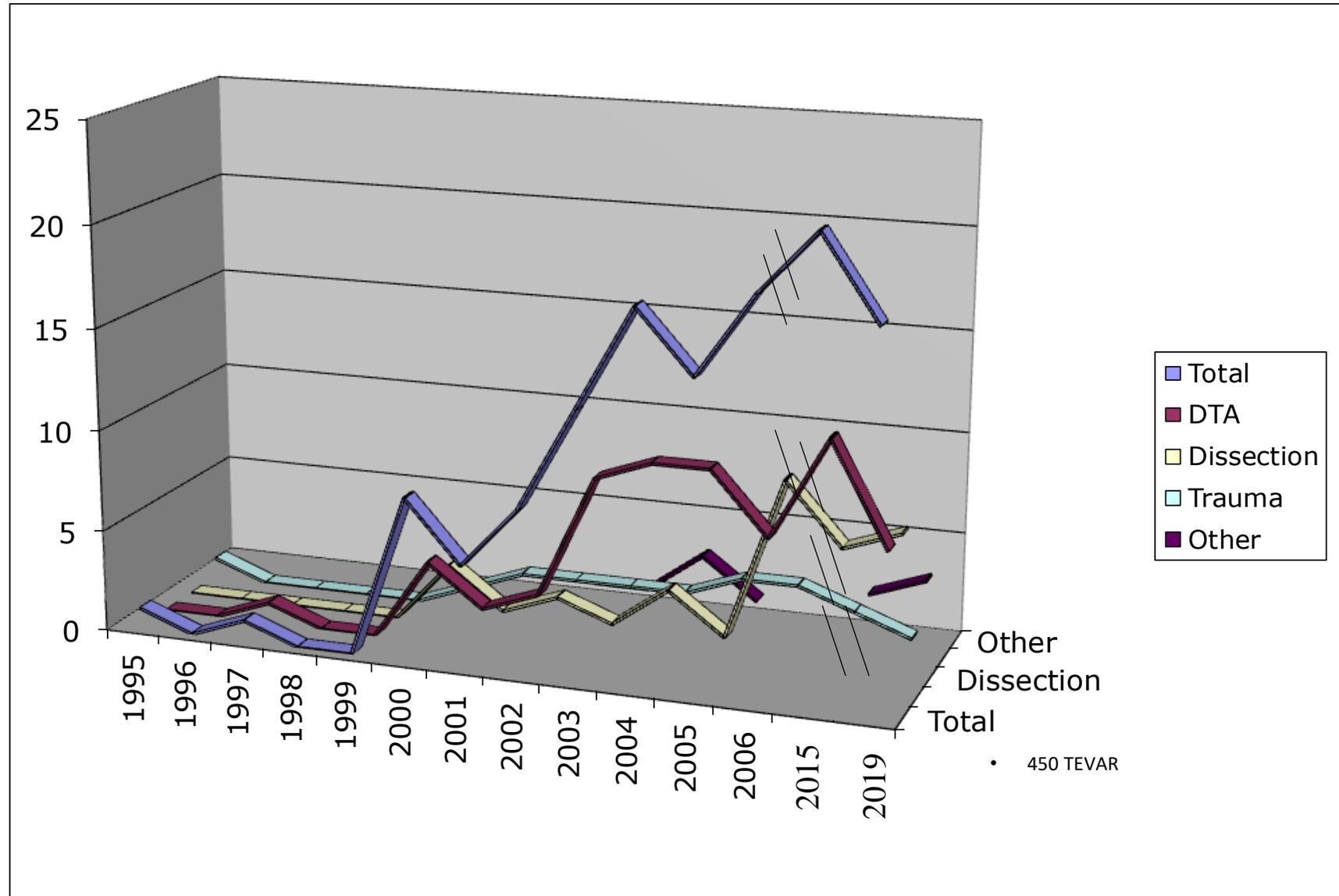
1995

- Post Traumatic False Aneurysm

Desgranges P *AJR* 1997

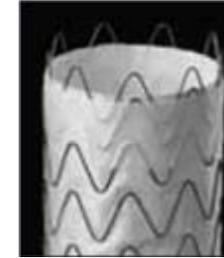


TEVAR Henri Mondor 1995 - 2019

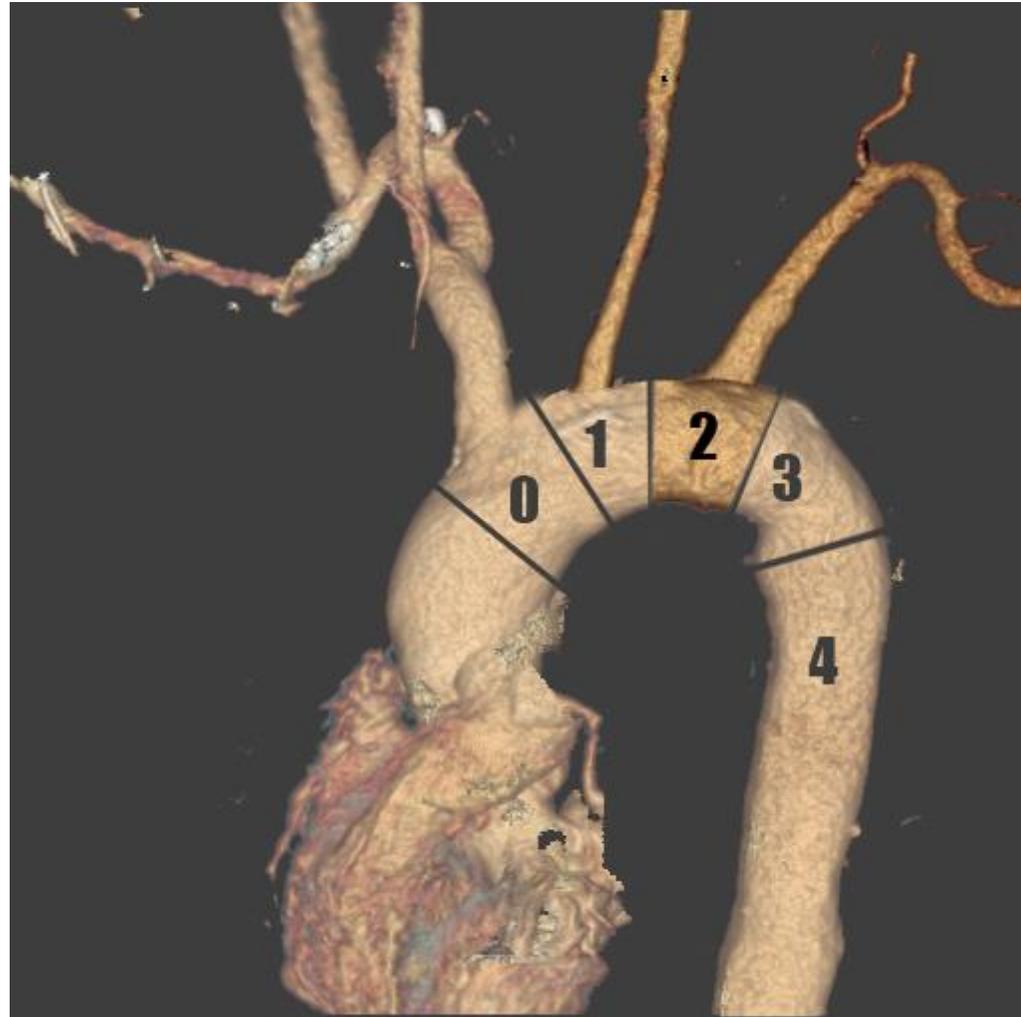


Endoprothèses disponibles

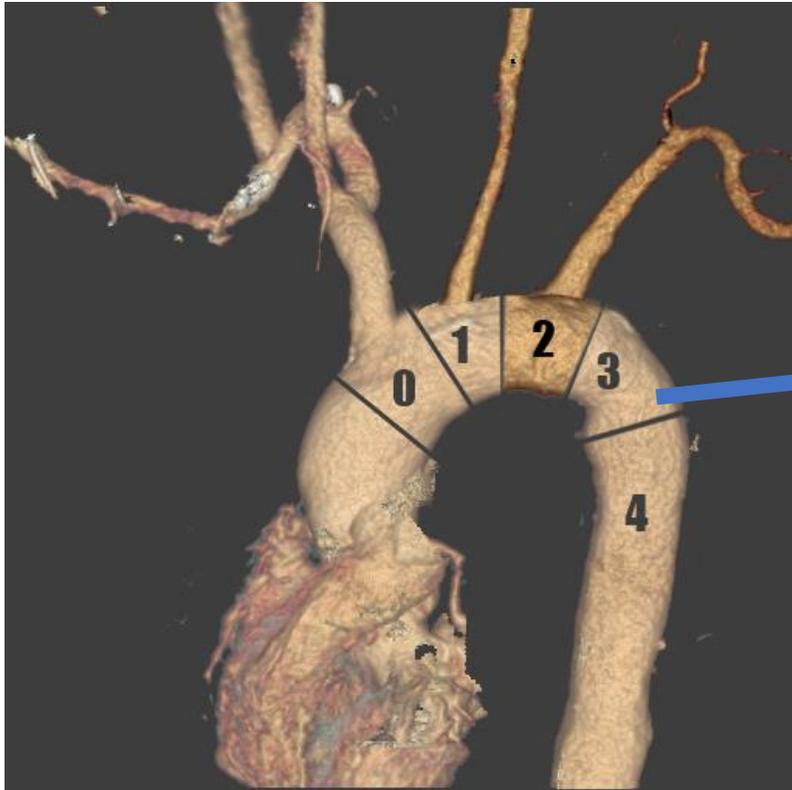
- Conformable Gore TAG (Gore)
- Valiant Captivia (Medtronic)
- Zenith TX2 with Pro-Form (Cook)
- Relay (Bolton-Terumo)



Classification d'Ishimaru

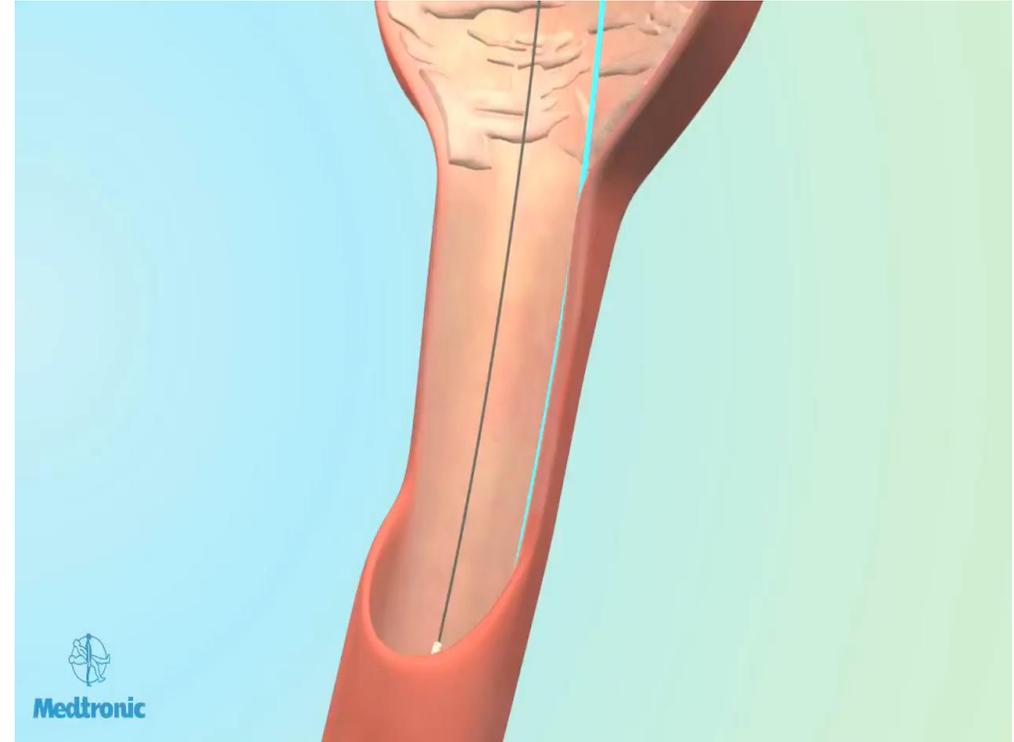


TEVAR seul: Zone 4



TEVAR: Principes généraux

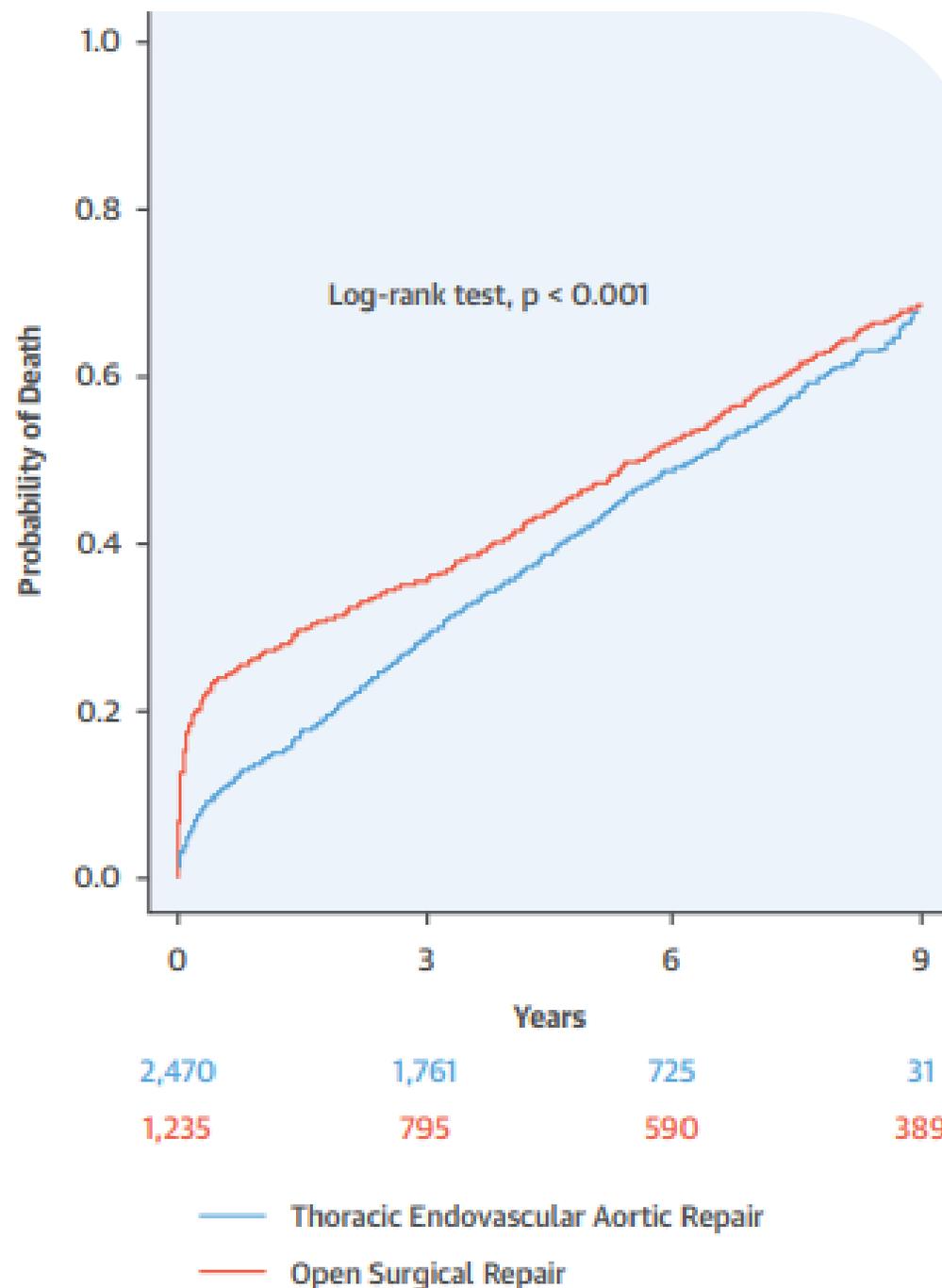
- « Landing » zones > 2 cm
- Surdimensionnement: 10-20%
- Couverture < 20cm
- **Sinon – mesures de protection moelle:**
 - TA haute
 - Drainage LCR
 - Revascularisation SCG
- **BONNE PLANIFICATION !**



Résultats TEVAR vs CHIRURGIE

	Chirurgie	TEVAR
• Mortalité	6-15%	2,5 %
• Paraplégie	5%	2 %
• Reinterventions -endofuites I>II	10%	20%

TEVAR VS. CHIRURGIE

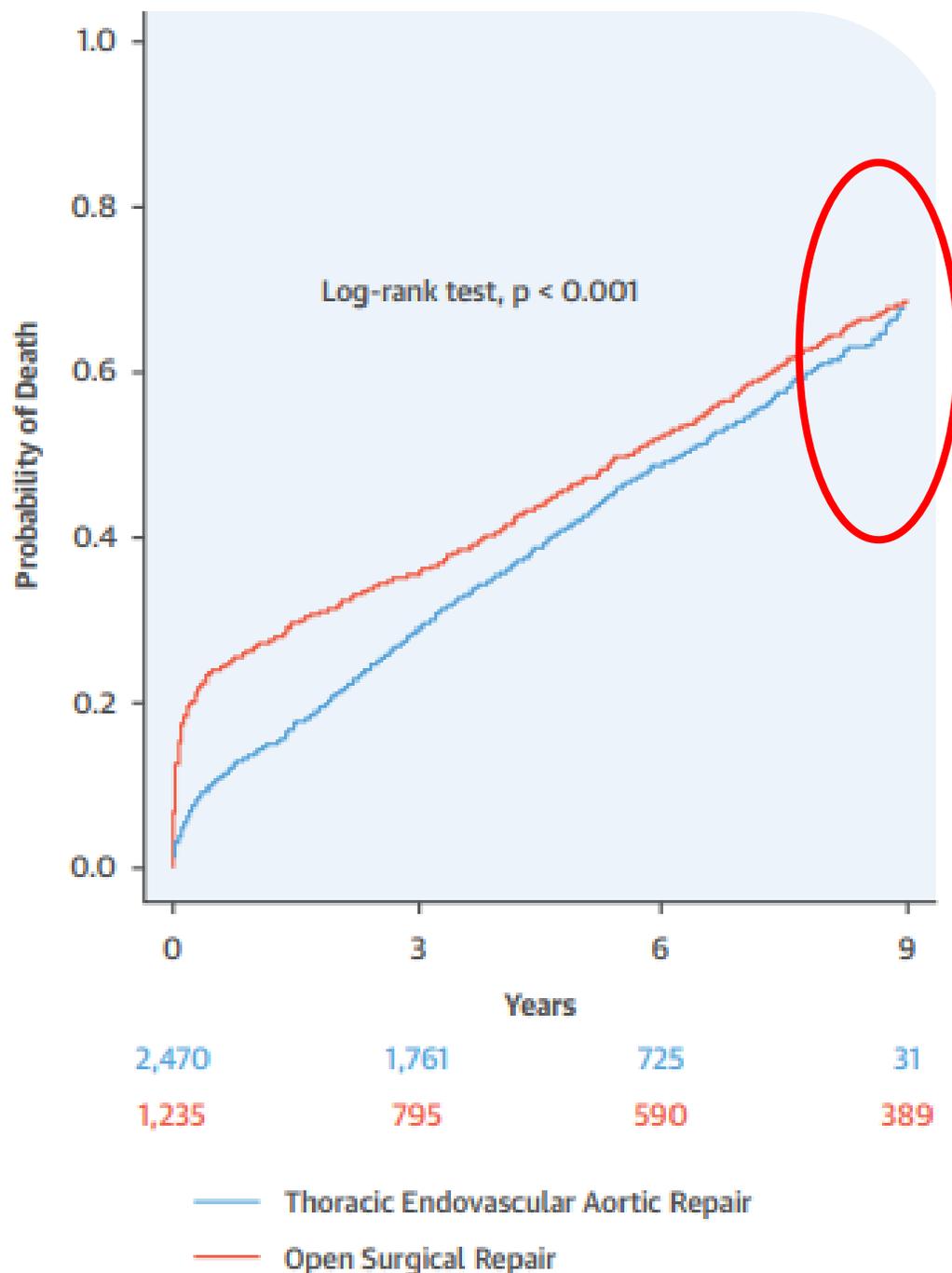


Base de données MEDICARE:

4580 TEVAR
1235 CHIRURGIE

Chiu et al, JACC, 2019

TEVAR VS. CHIRURGIE



Base de données MEDICARE:

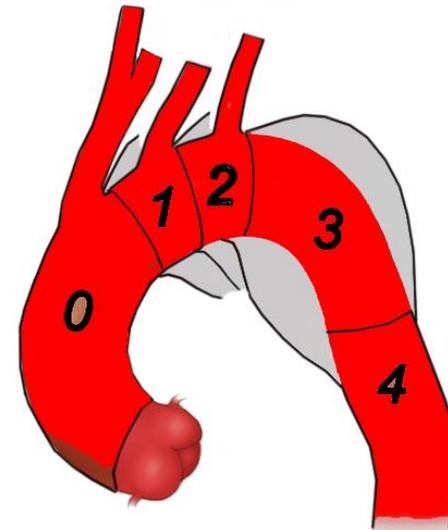
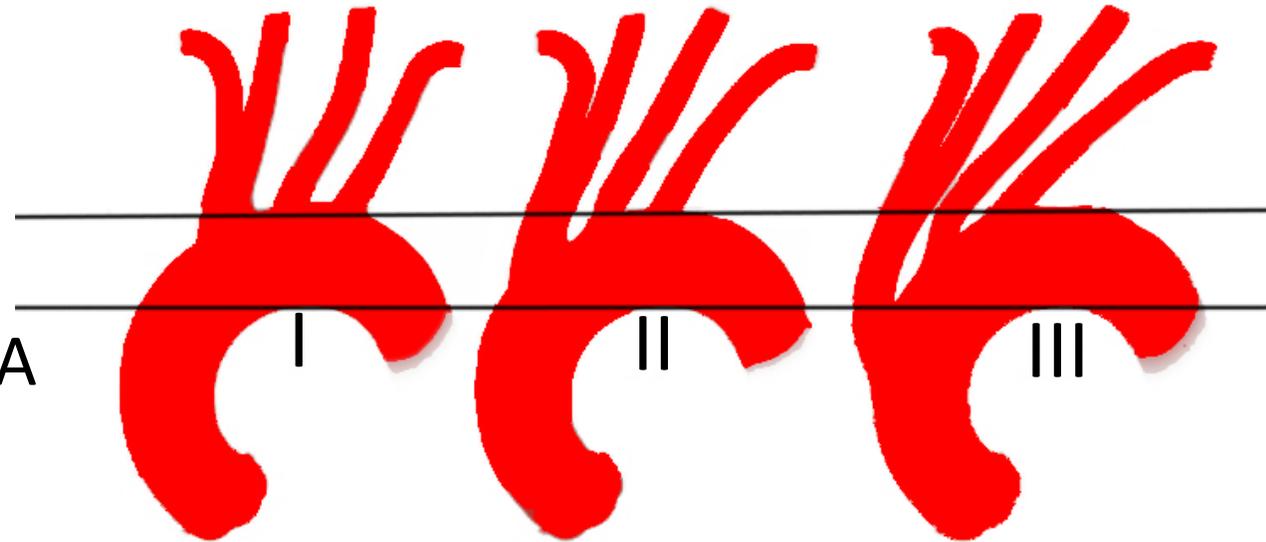
4580 TEVAR
1235 CHIRURGIE

Chiu et al, JACC, 2019

TEVAR Crosse: zones 2<1<0

Contraintes spécifiques

- Angulation aortique
- Variabilité anatomique origine des TSA
- Distance / coronaires et valve Ao
- Flux systolique / Mouvements respiratoires
- Facteurs additionnels
 - Thrombus / Athérome
 - Pontage aorto-coronarien
 - Valve Ao mécanique
 - Insuffisance de la zone d'amarrage proximal



Techniques endovasculaires

Crosse: zones 2 < 1 < 0

Revascularisation des troncs supra aortiques

Endoprothèse thoracique
=TEVAR

+

Hybride

- Reconstruction directe
- Debranching

Stents parallèles

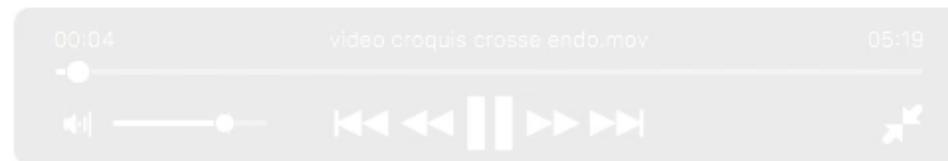
- Chimney / Snorkel grafts

Fenêtres

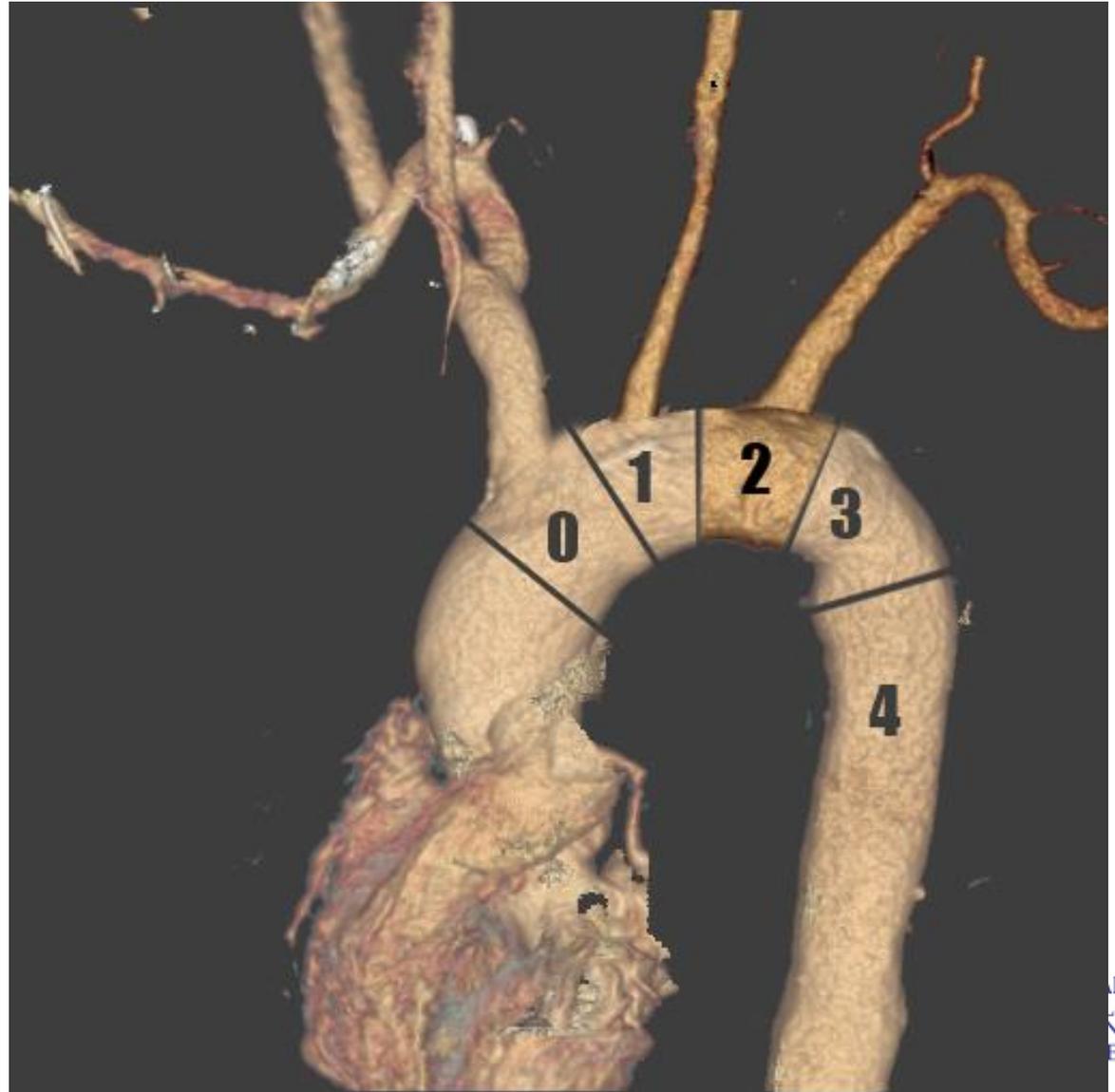
- Endoprothèse fenêtrée
- **Fenestration in situ « laser »**
- Fenêtres « home-made »

Branches

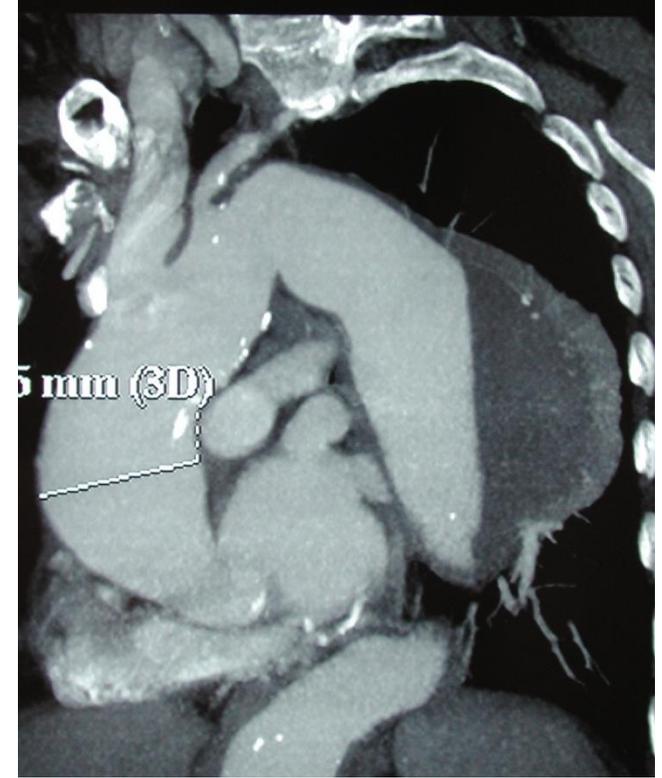
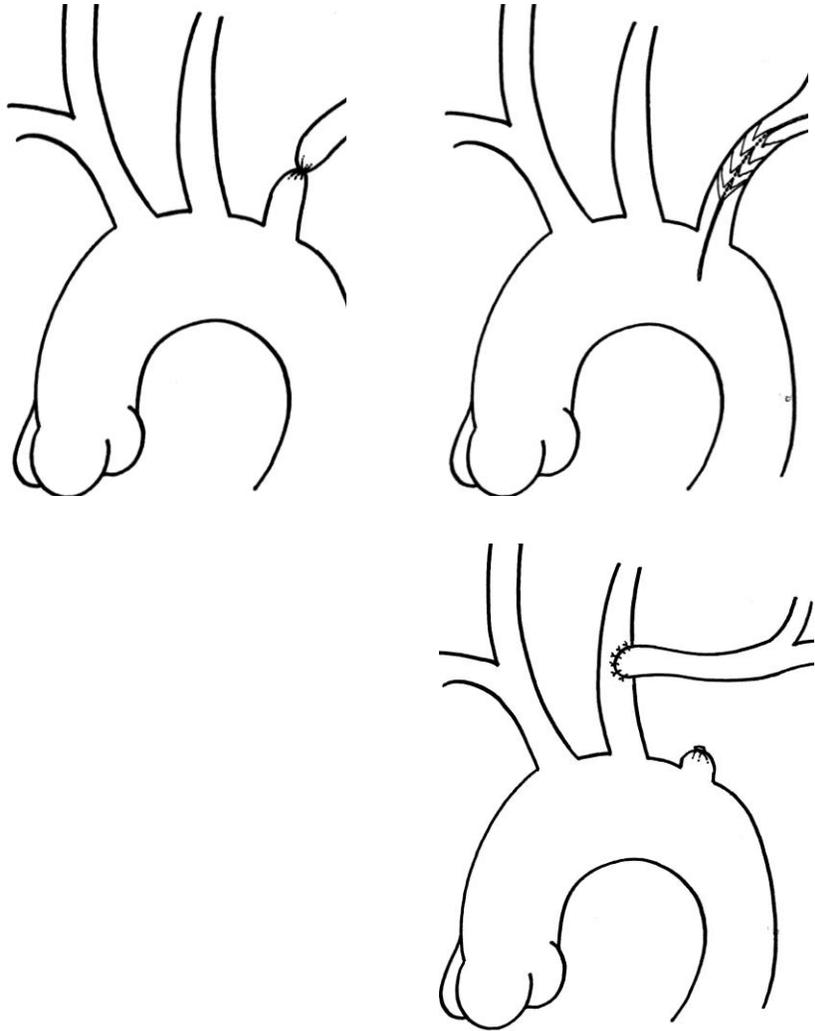
- Endoprothèse branchée



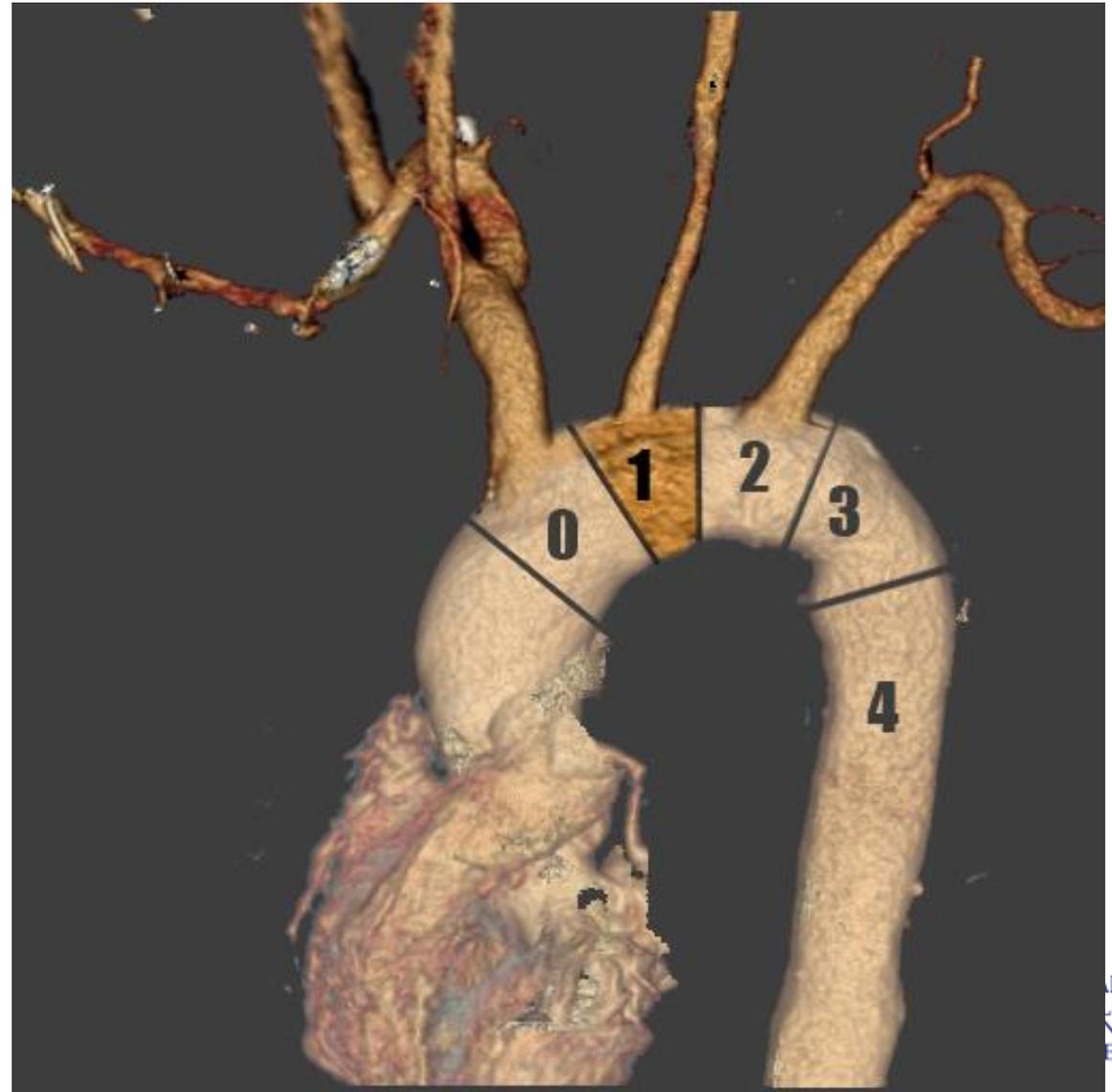
Techniques hybrides / zone 2



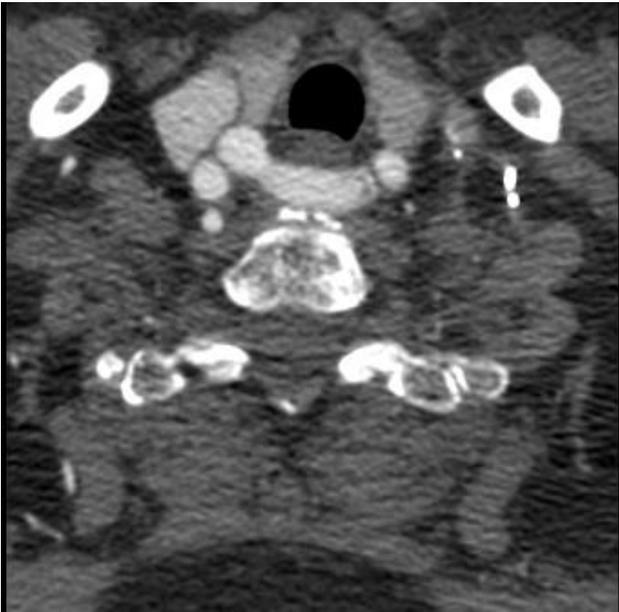
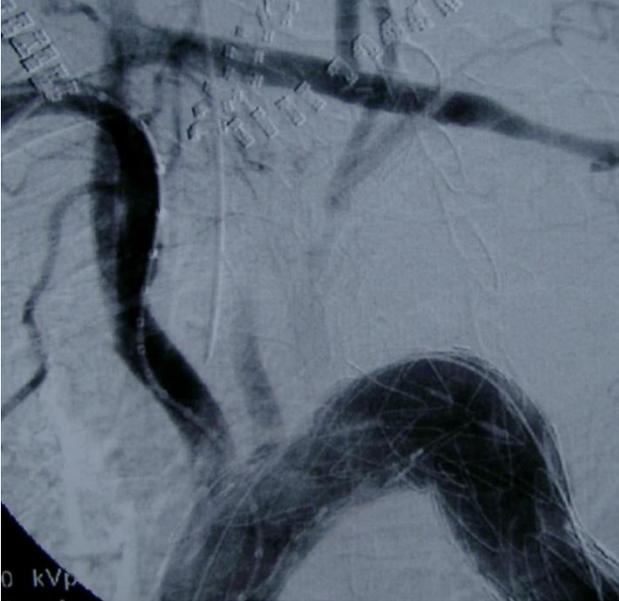
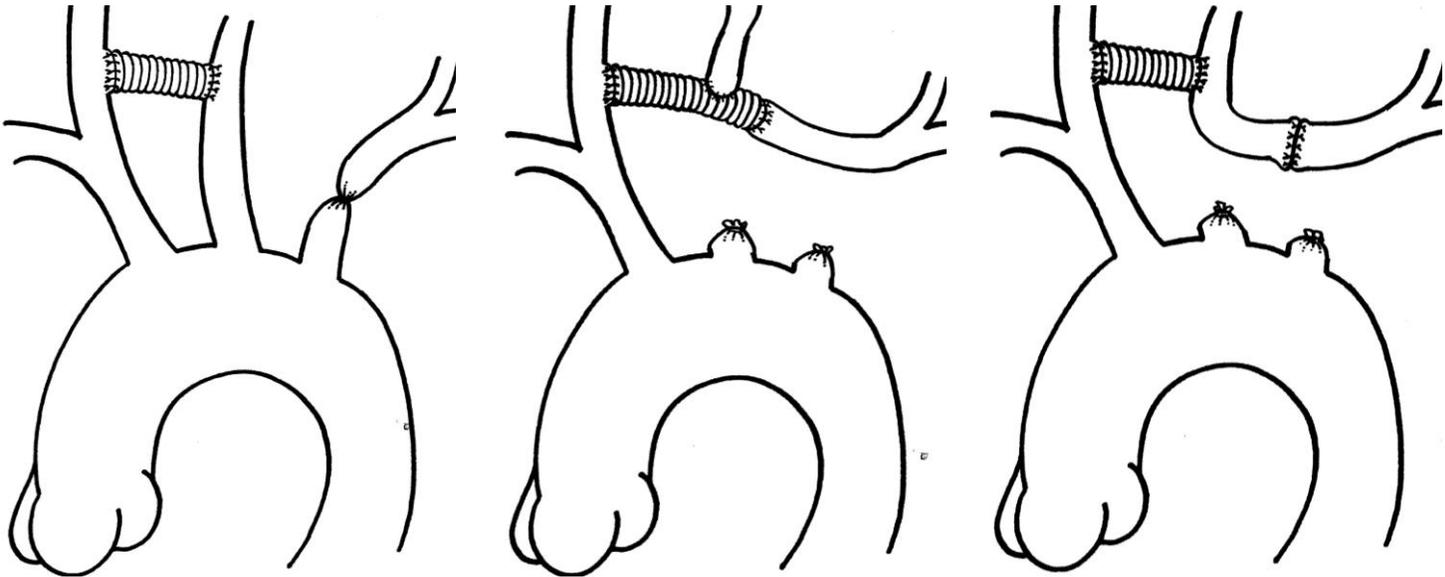
Technique hybride Zone 2



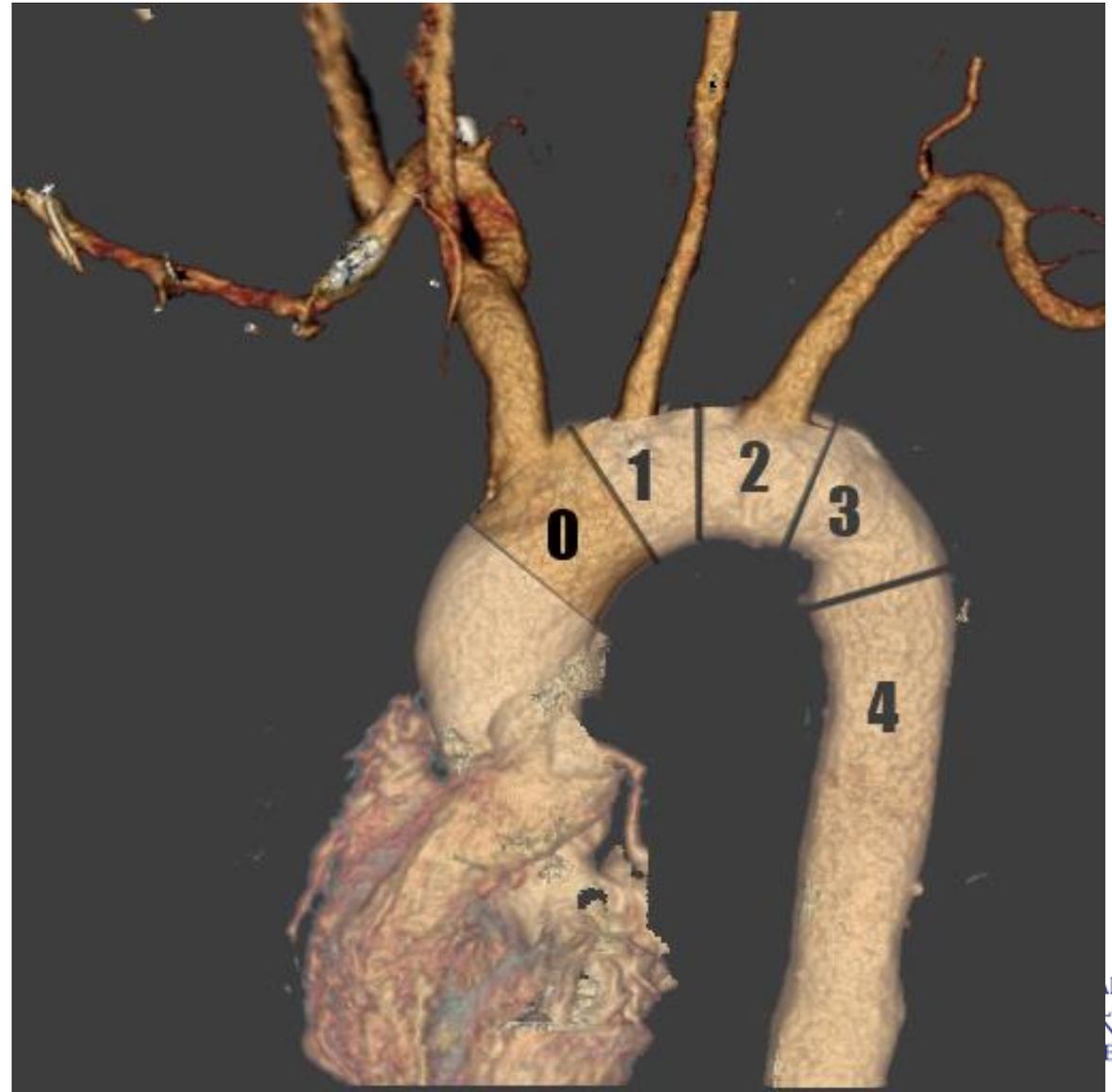
Technique hybride zone 1



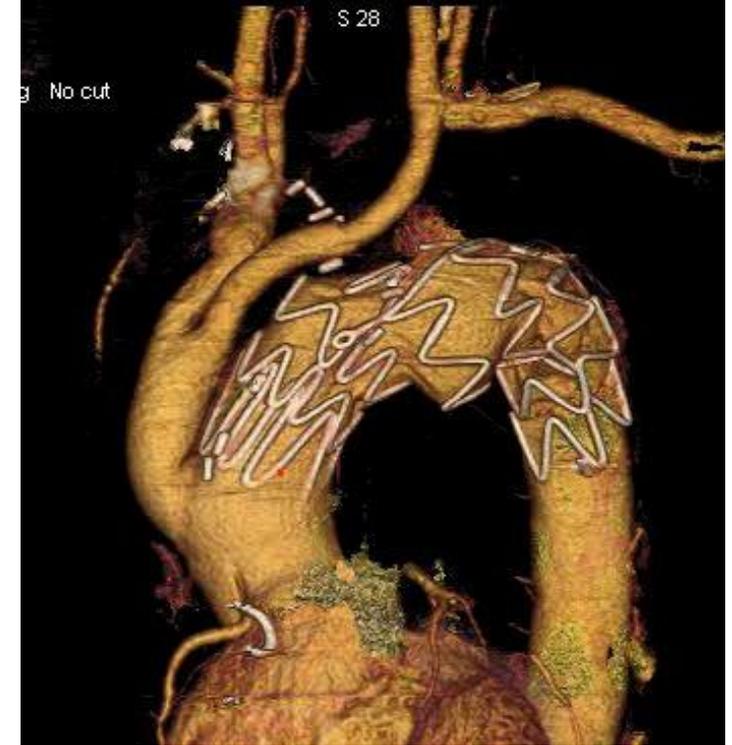
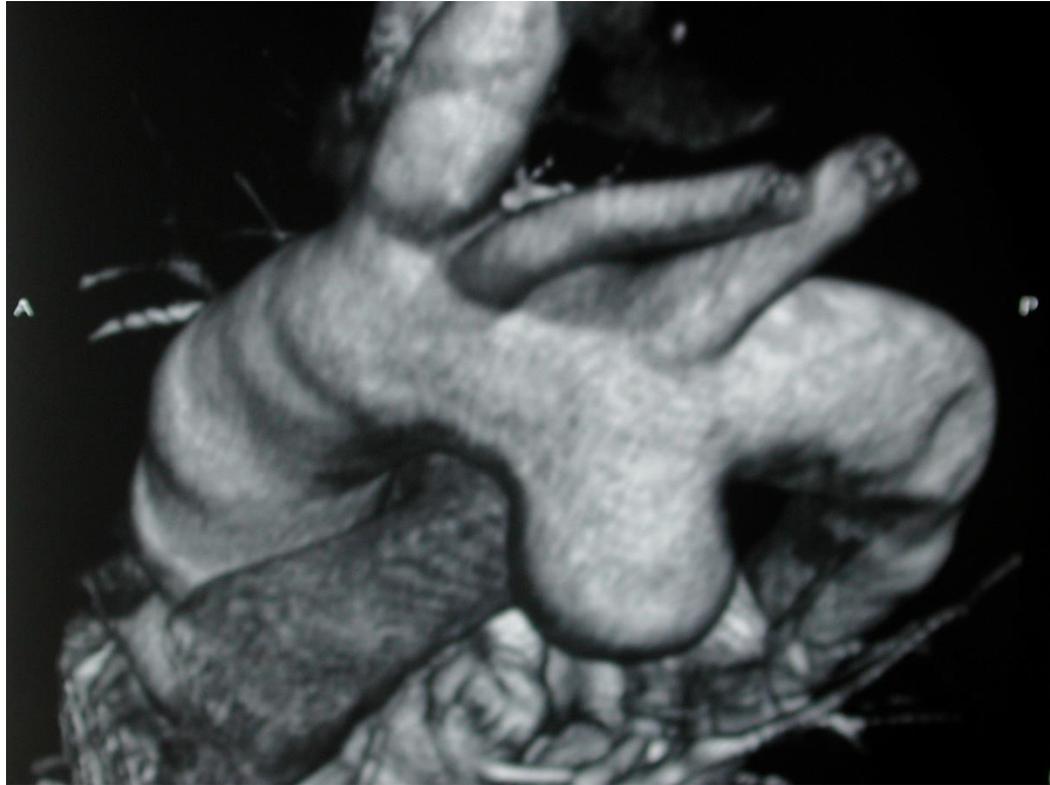
Technique hybride zone 1



Techniques hybrides/zone 0



Techniques hybrides / zone 0



Techniques hybrides

- Hopital Henri Mondor, 2012

	N pts	30-day mortality	In-hospital mortality
Supra Aortic Trunks	29	13,8%	17,2%
Visceral arteries	9	44,4%	66,7%
SAT + Visc.	2	50,0%	100,0%

TEVAR + debranching des TSA

N=211 dont 75% SCG

Mortalité périopératoire 7,5%

AVC 4%

Complications locales

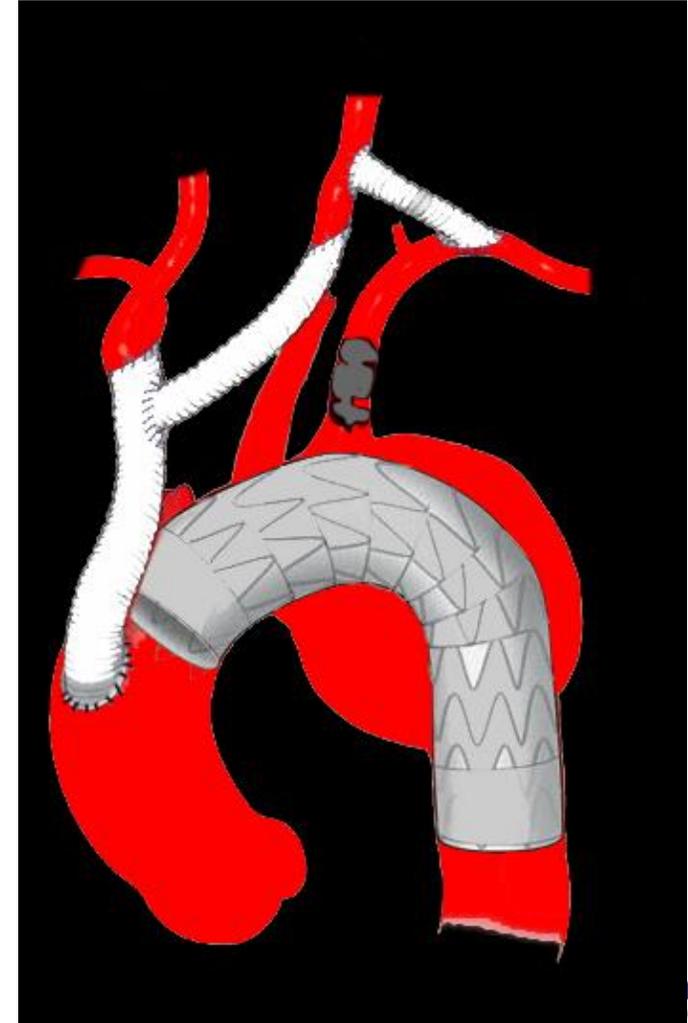
hémorragiques 10%

neurologiques 9%

Meilleurs en 2 temps

Pas de problème de perméabilité

Konstantinou et al., EJVES, 2019



APPORT DE LA SALLE HYBRIDE

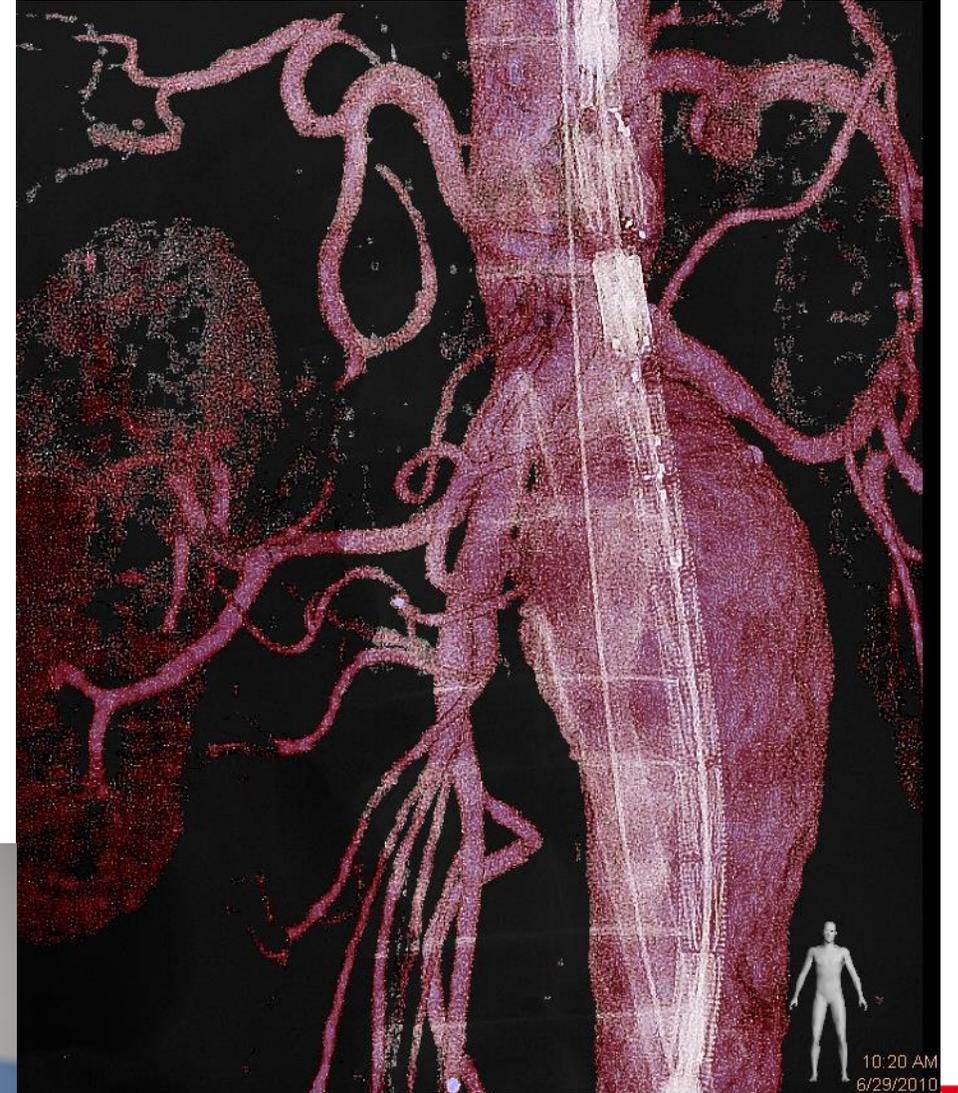
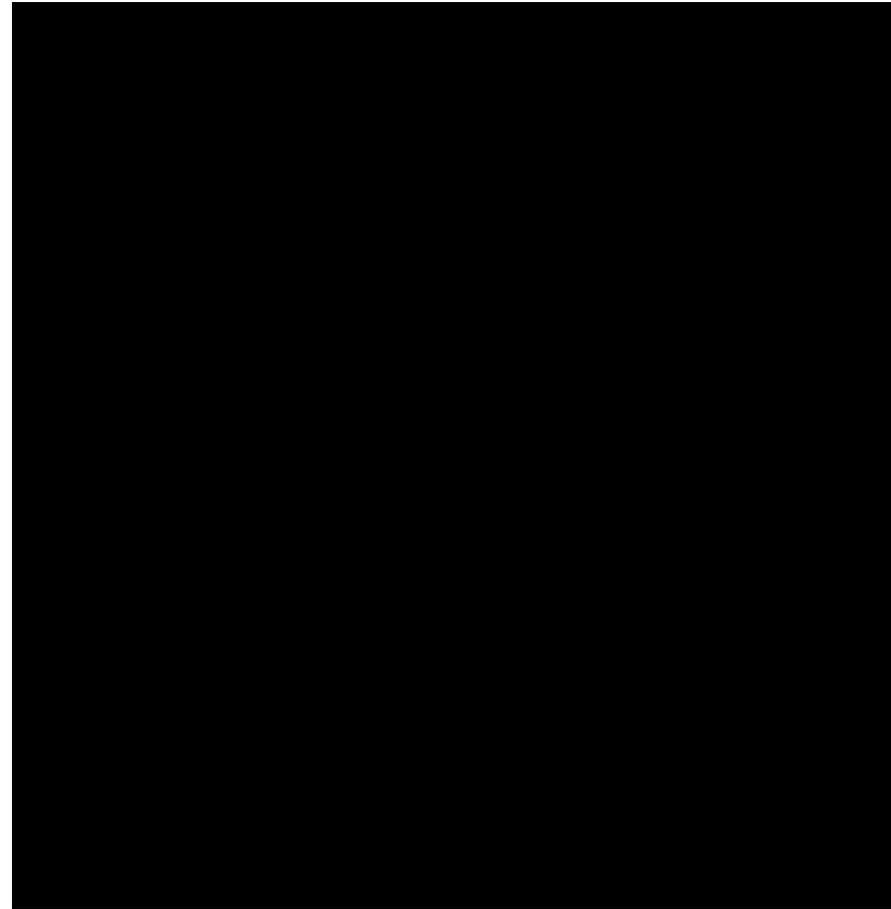
✓ Intérêts :

Exigence de sécurité du bloc opératoire (ISO 5)

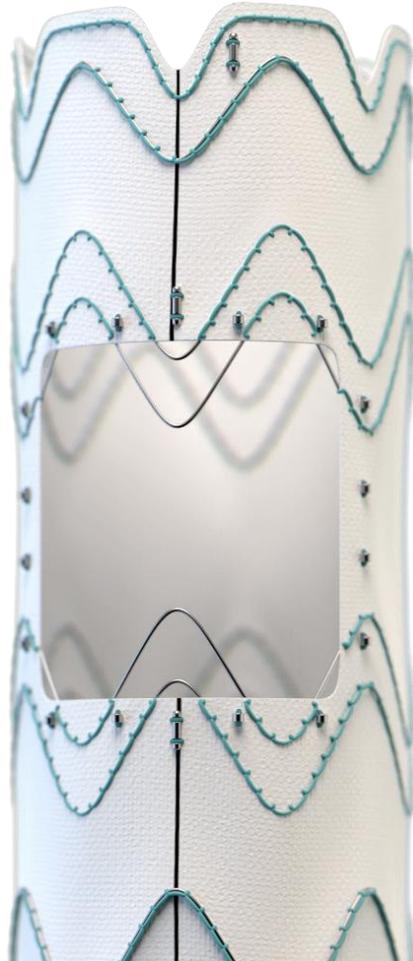
- + Haute Qualité Image/fusion d'image
- + Limitation de la radio exposition
- + Diminution PDC
- + Meilleure précision
- + Diminution du temps opératoire
- + «Sensation» d'une opération plus facile
- + **CHIRURGIE HYBRIDE +++**



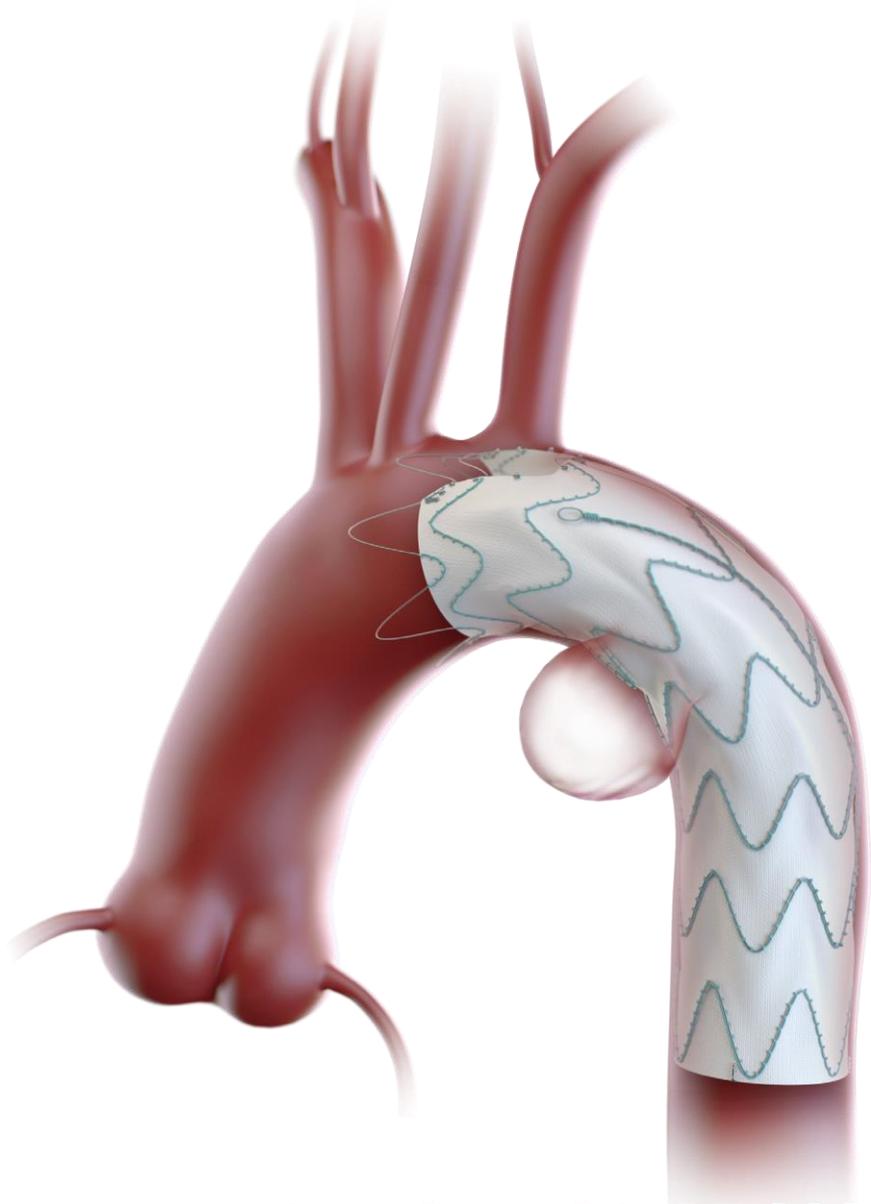
Utilisation de la Fusion d'image



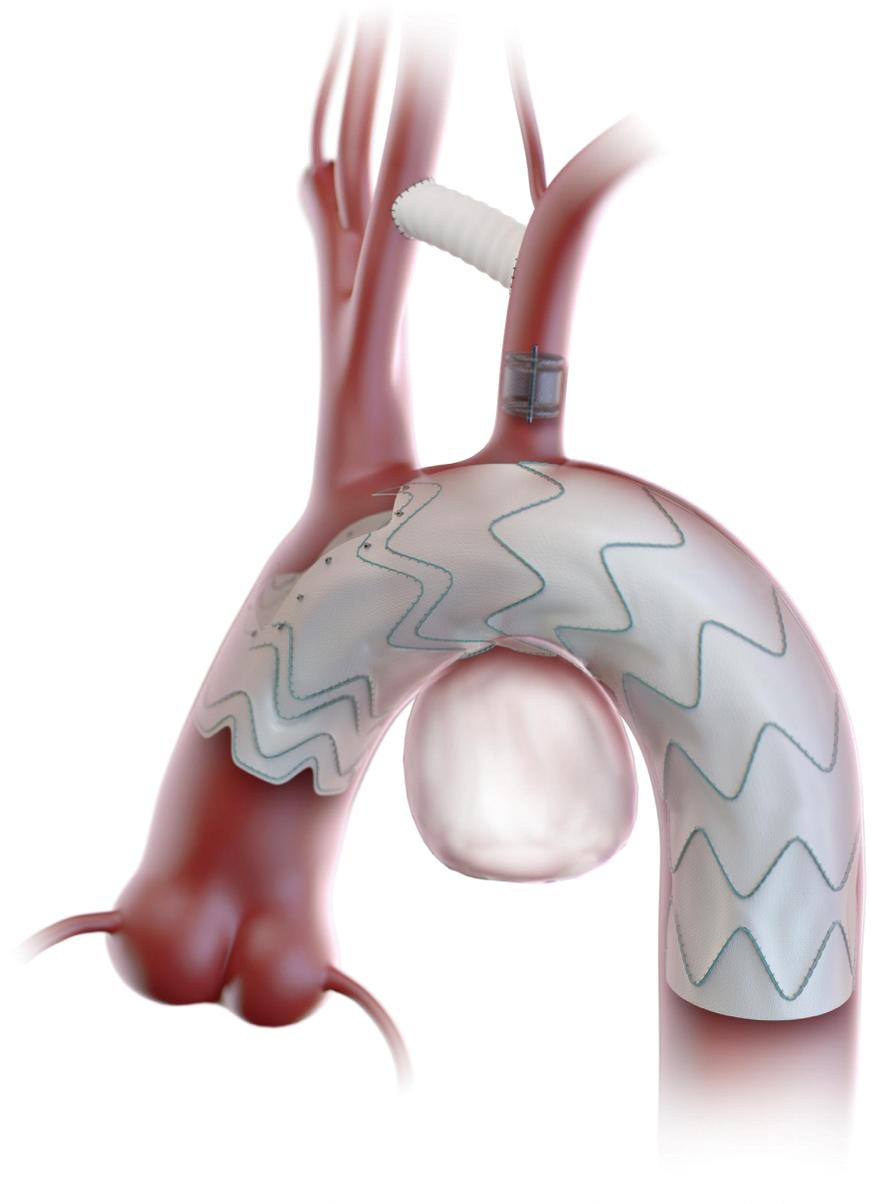
Endoprothèses fenêtrées sur mesure



Bolton Relay



TEVAR + ECHANCRURE SCG



TEVAR+ FENETRE TABC

Endoprothèses fenêtrées

Problèmes

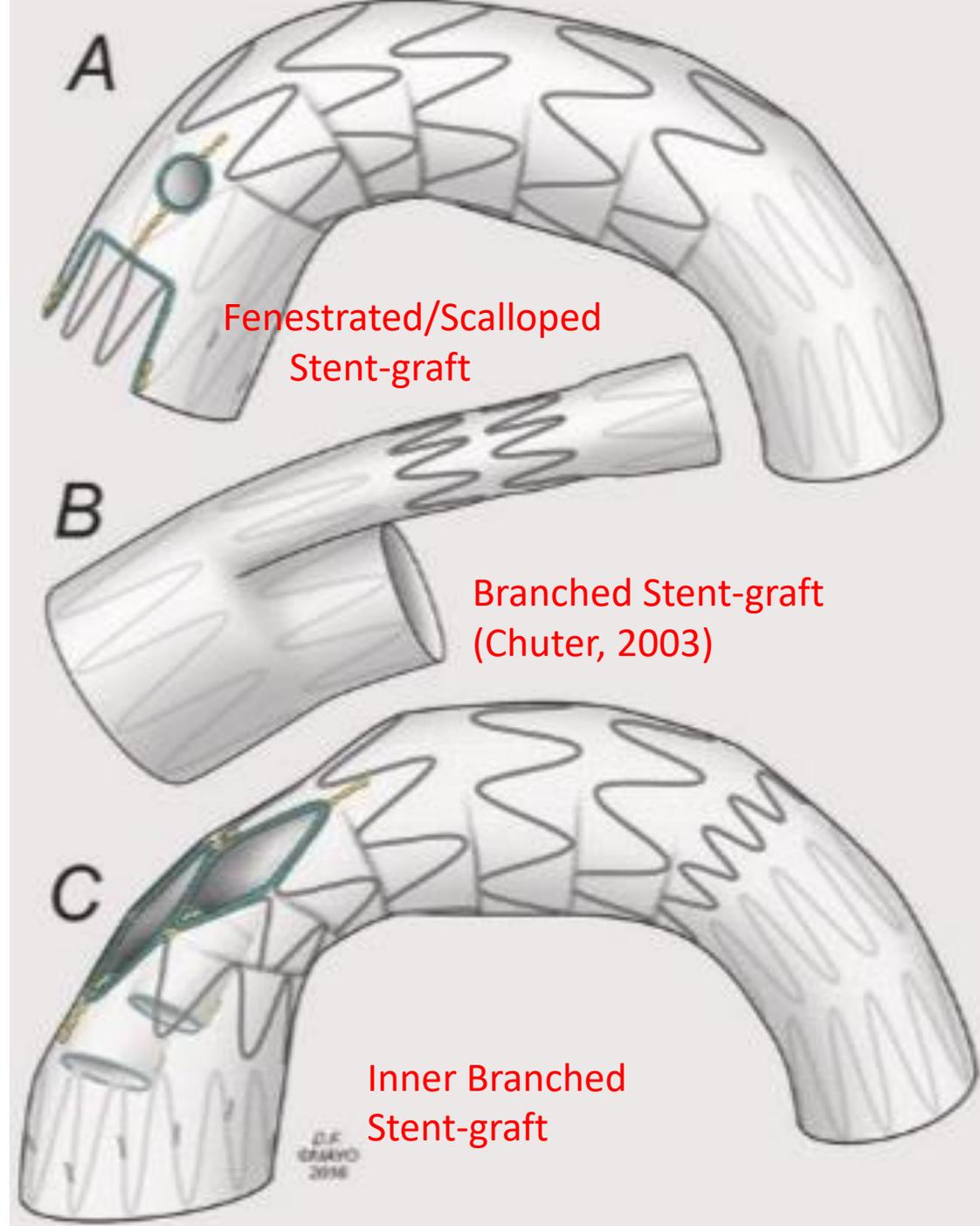
- Difficultés de positionnement / ostia TSA à cause de l'angulation de la crosse
- Manœuvres de repositionnement et **risque embolique +++**
- Idéal pour 1 TSA
- Importance des guides « pré-loadés »
- **Coût**
- **Delai de confection > 8 semaines**



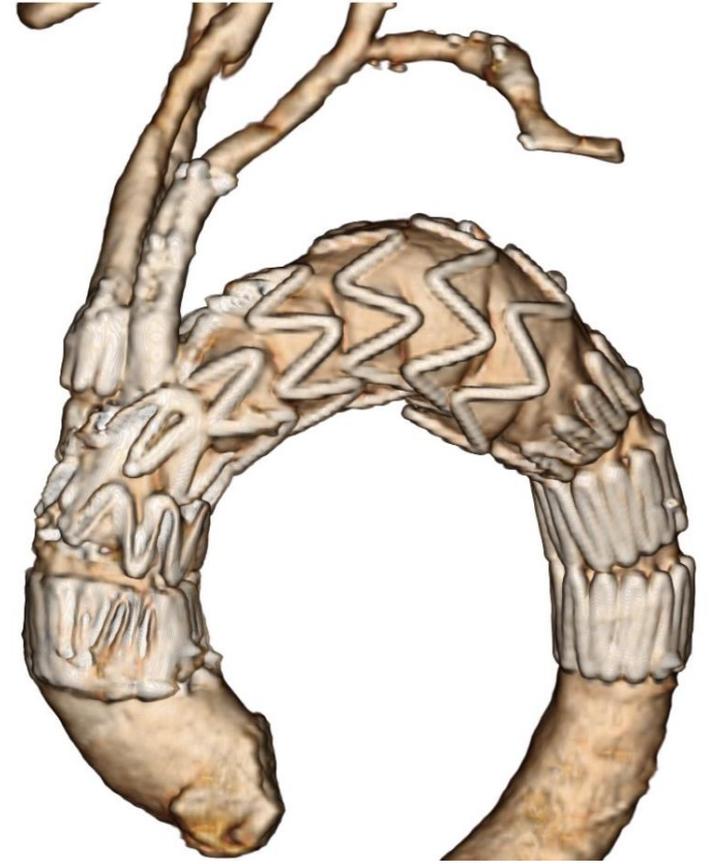
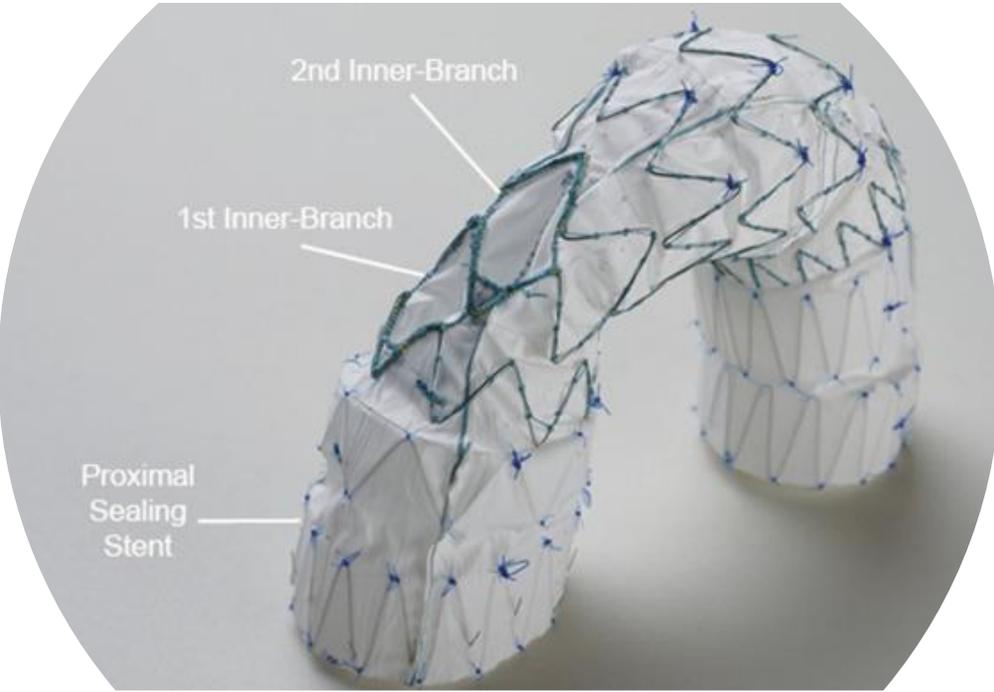
EVOLUTION



VERS DES ENDOPROTHESES BRANCHEES

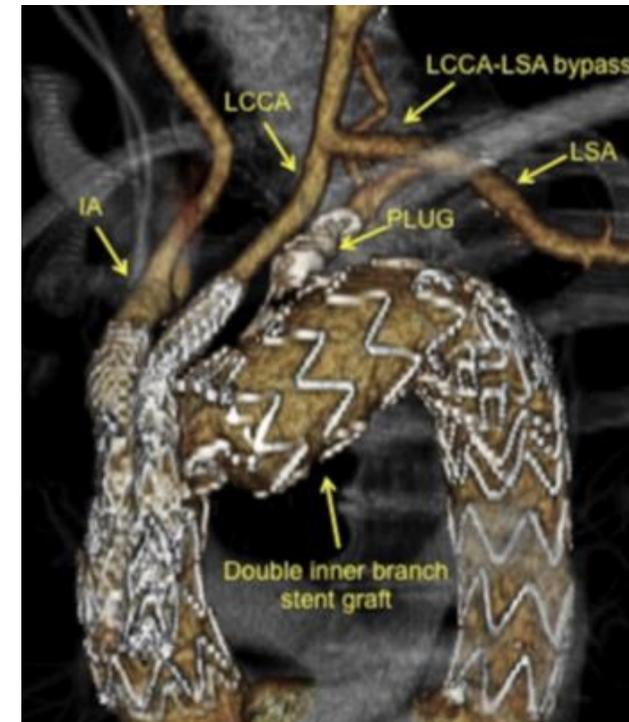
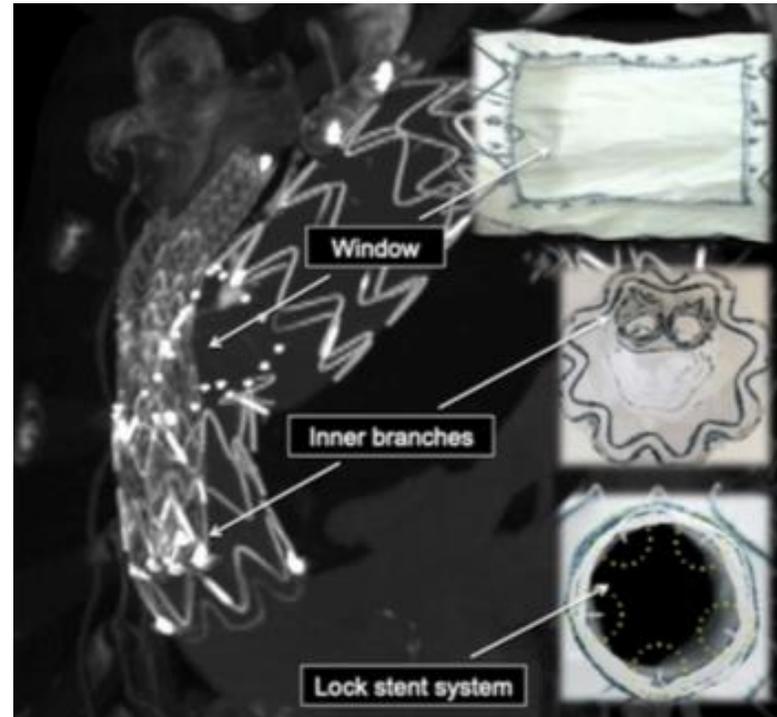


Endovascular Aortic
Repair;
Gustavo S. Oderich,
David Factor; 2017.

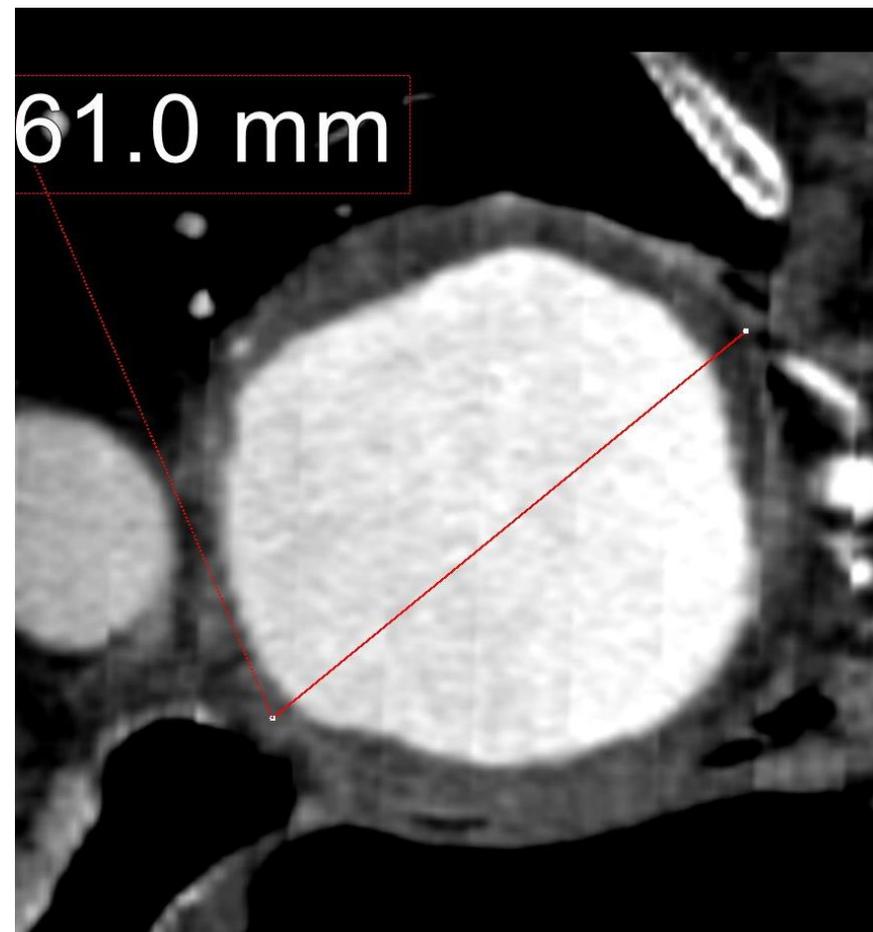


ReleyBranch Stent-graft (Terumo Aortic)

- Transposition or LSA and LCCA Bypass
- Branch to the IA and LCCA + LSA plug

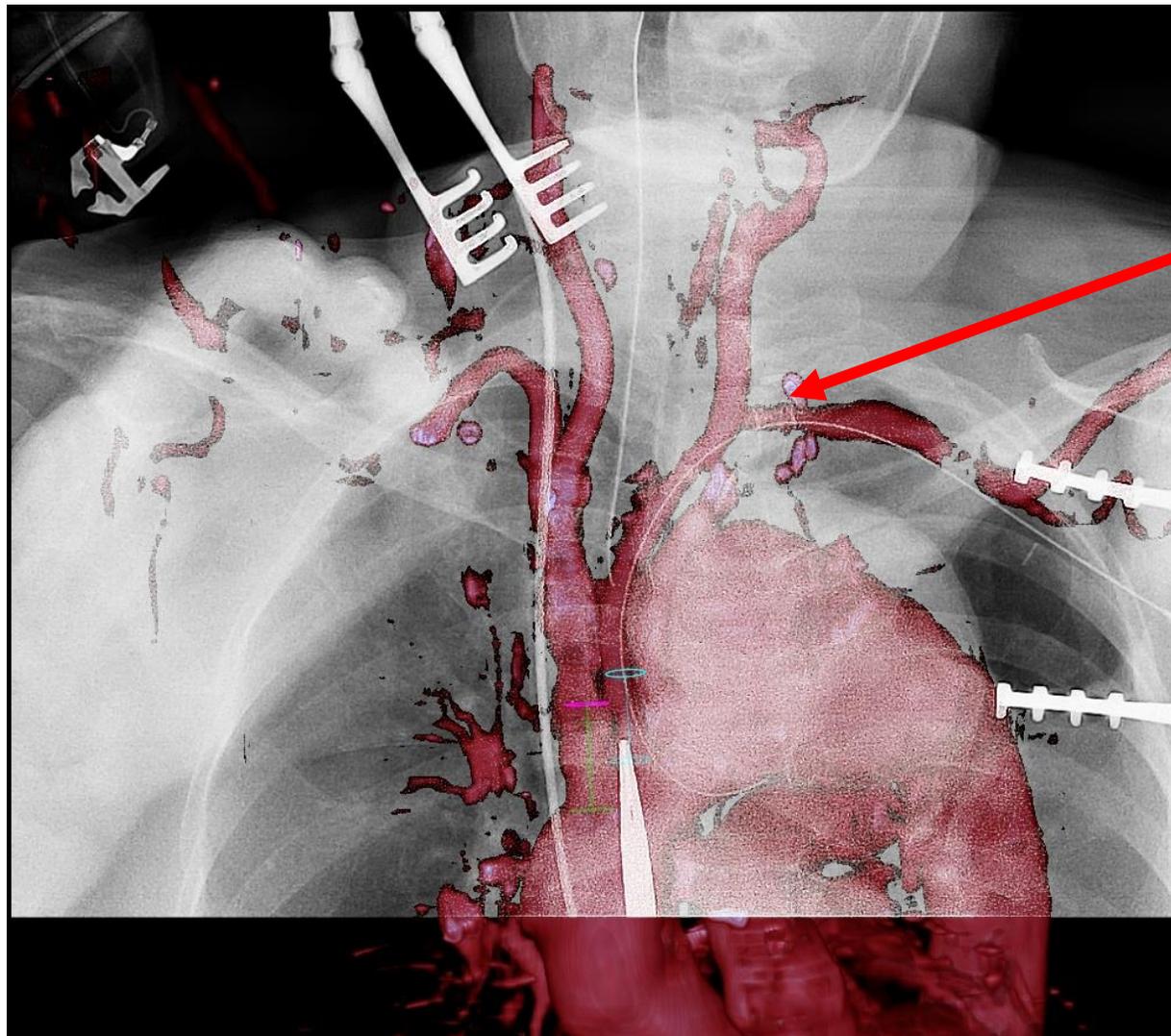


FE 77 ans
An crosse
61 mm
Coro +



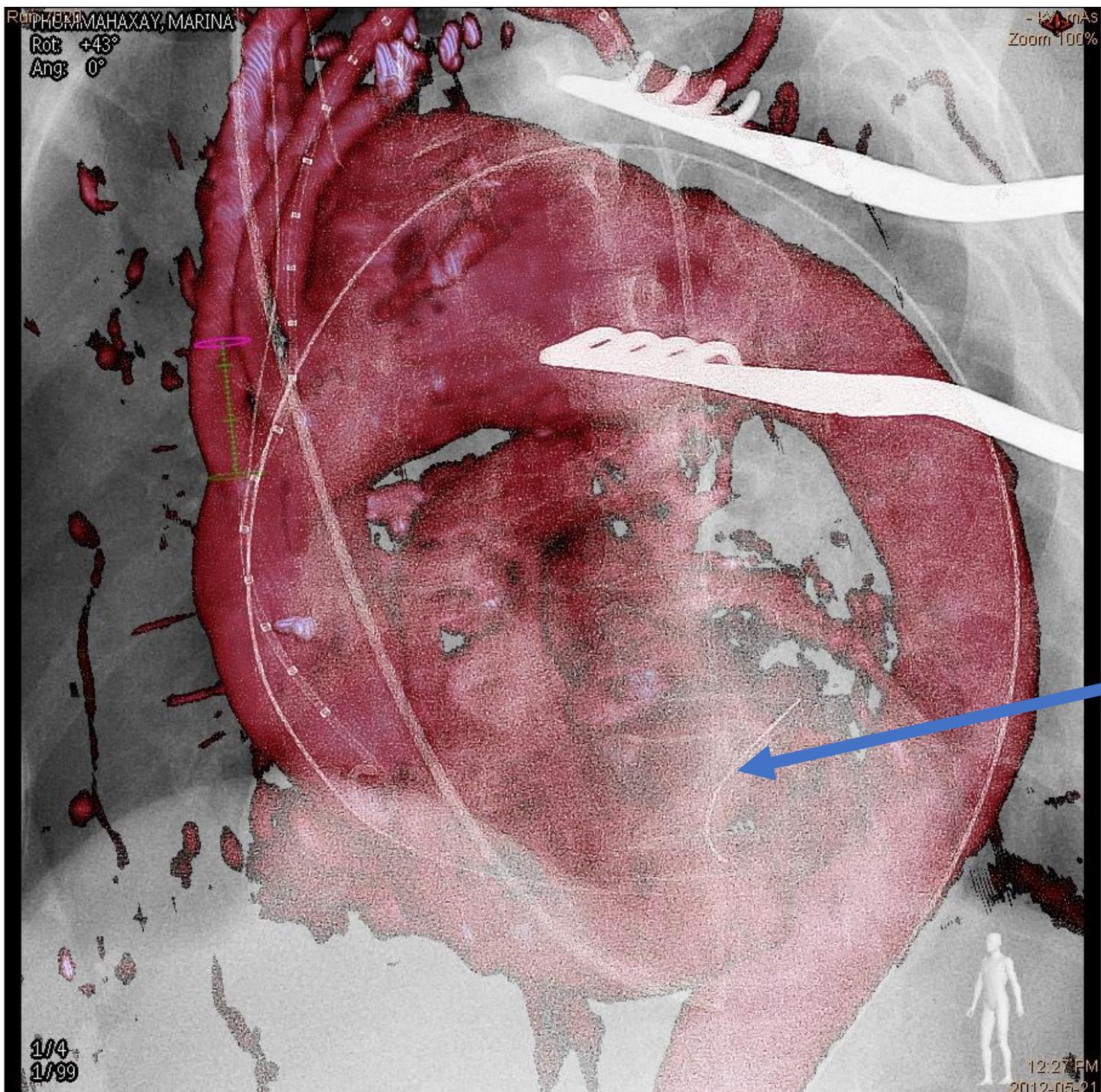
Abord Carotidien Dt

: Pacing + jambage TABC

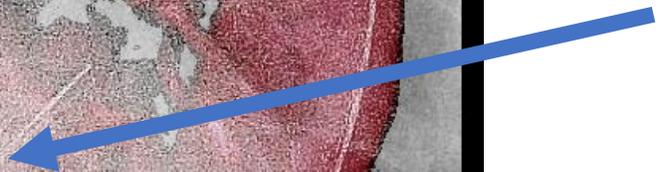


**1 Re-implantation
SCG-CPG**

**2 Abord Axillaire
G: jambage CPG**

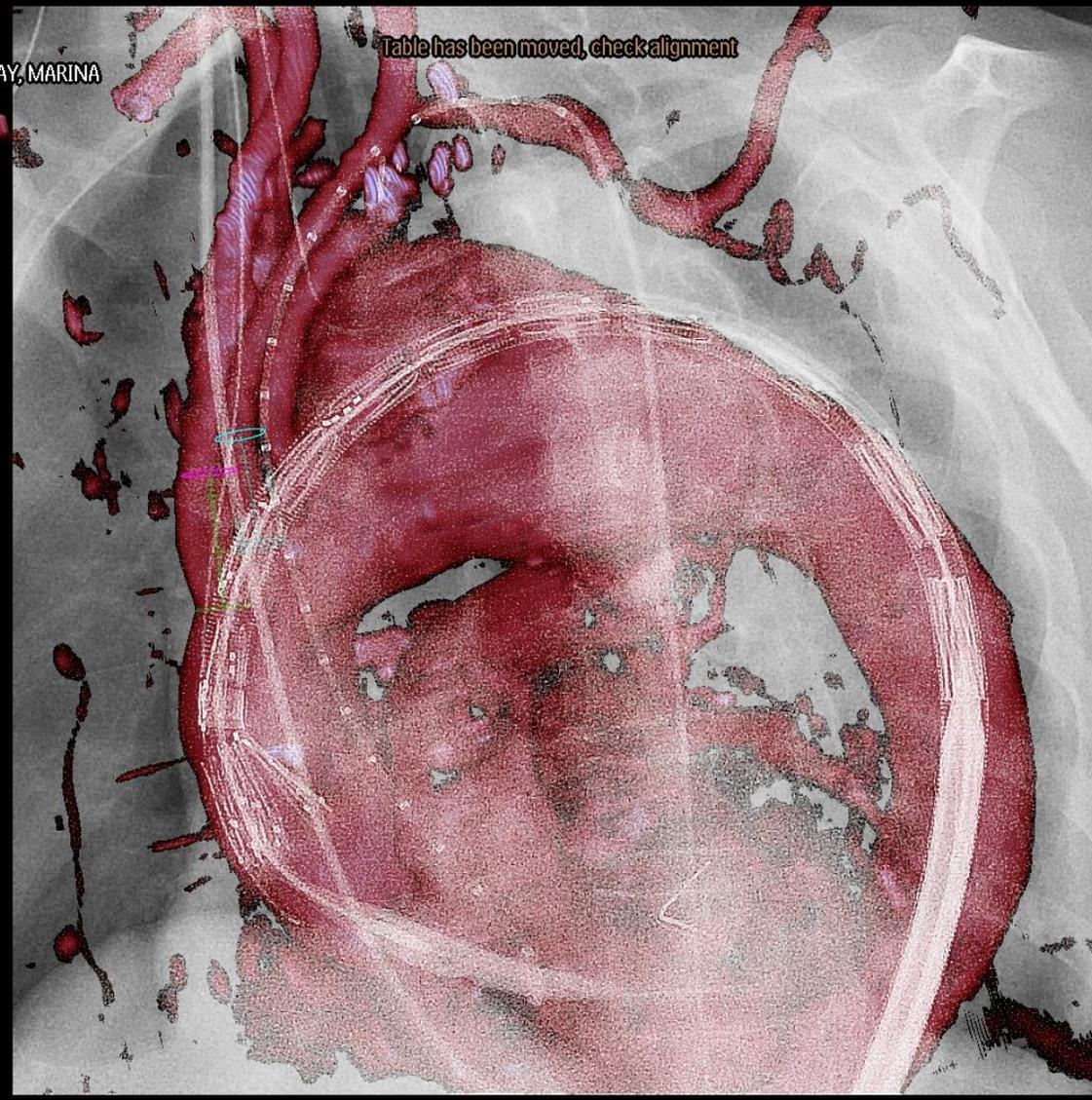


GUIDE
Femoral Stiff
Ds VG

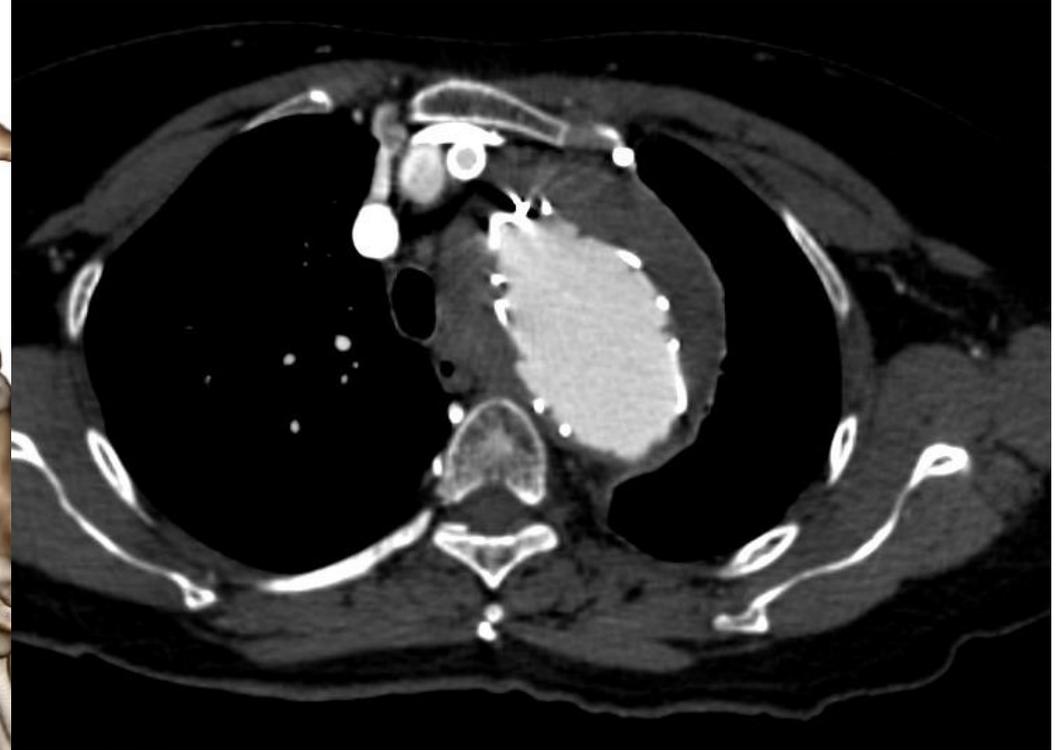
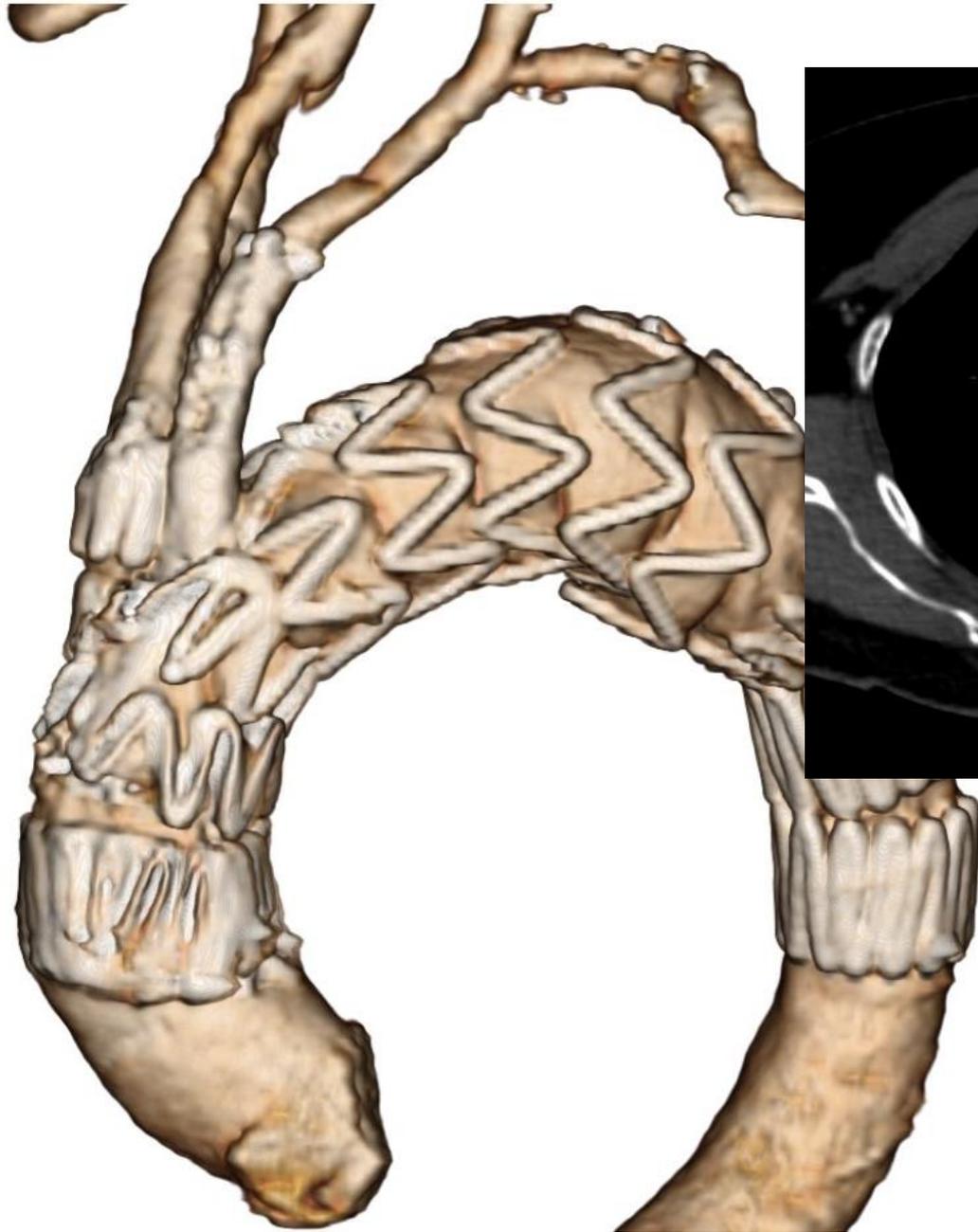


PHOMMAHAXAY, MARINA
Rot: +43°
Ang: 0°

Table has been moved, check alignment





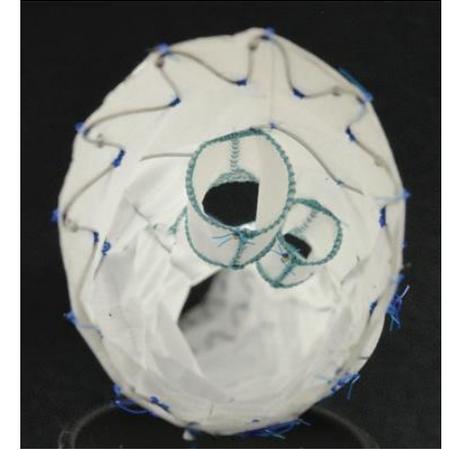
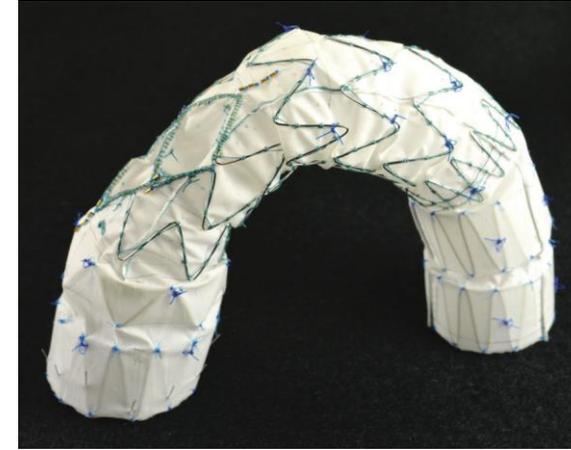


One month control

Endoprothèses branchées

Eligibilité anatomique

- Anévrisme ou dissection de la crosse
- Accès iliaque pour 22-24Fr
- **Pas d'antécédent de chirurgie valvulaire**
- Aorte ascendante
 - **Diamètre < 38 mm**
 - **Collet sain > 40 mm**
 - L (jonction sinotubulaire – TABC) > 50 mm
- TABC
 - Diamètre < 20 mm
 - Collet > 20 mm



Endoprothèses branchées

Résultats contemporains

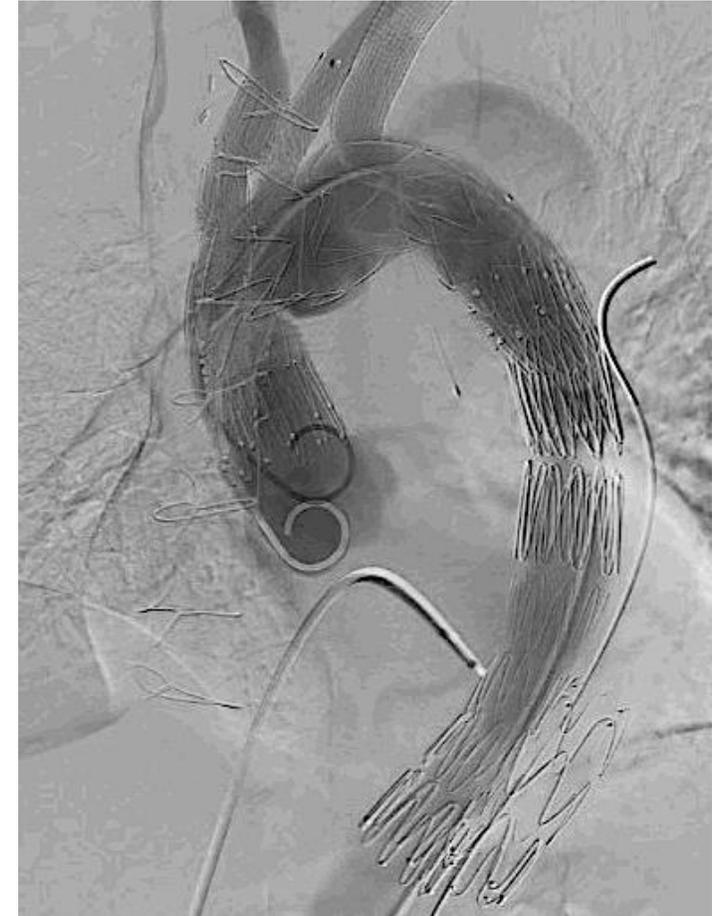
Mortalité péri-opératoire: 10%

AVC permanent: 3.5 %

IRA / Paraplégie: 0%

Série de 30 patients dont HM

Haulon et al. Br J Surg, 2018



Au prix d'une courbe d'apprentissage

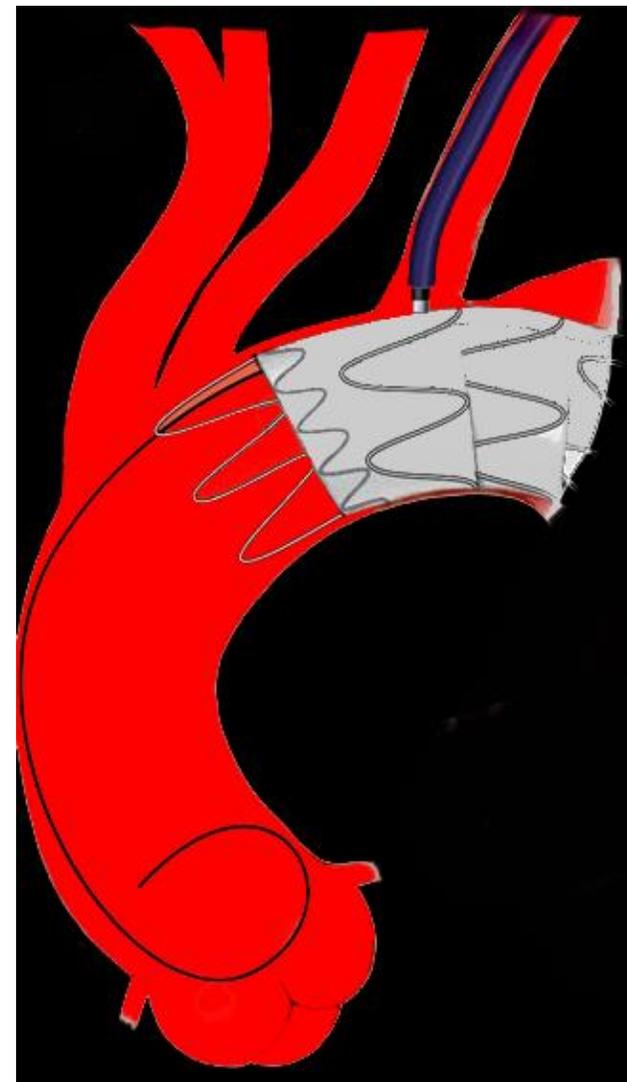
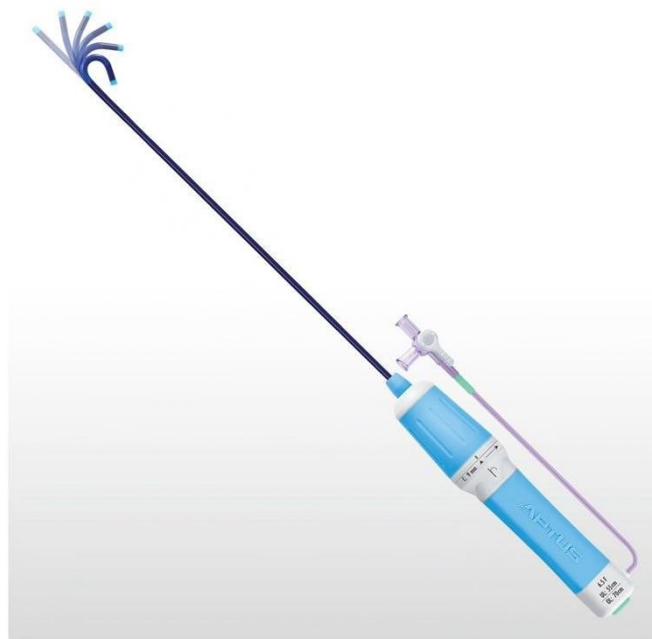
Equipes expertes

Respect strictes des IFU

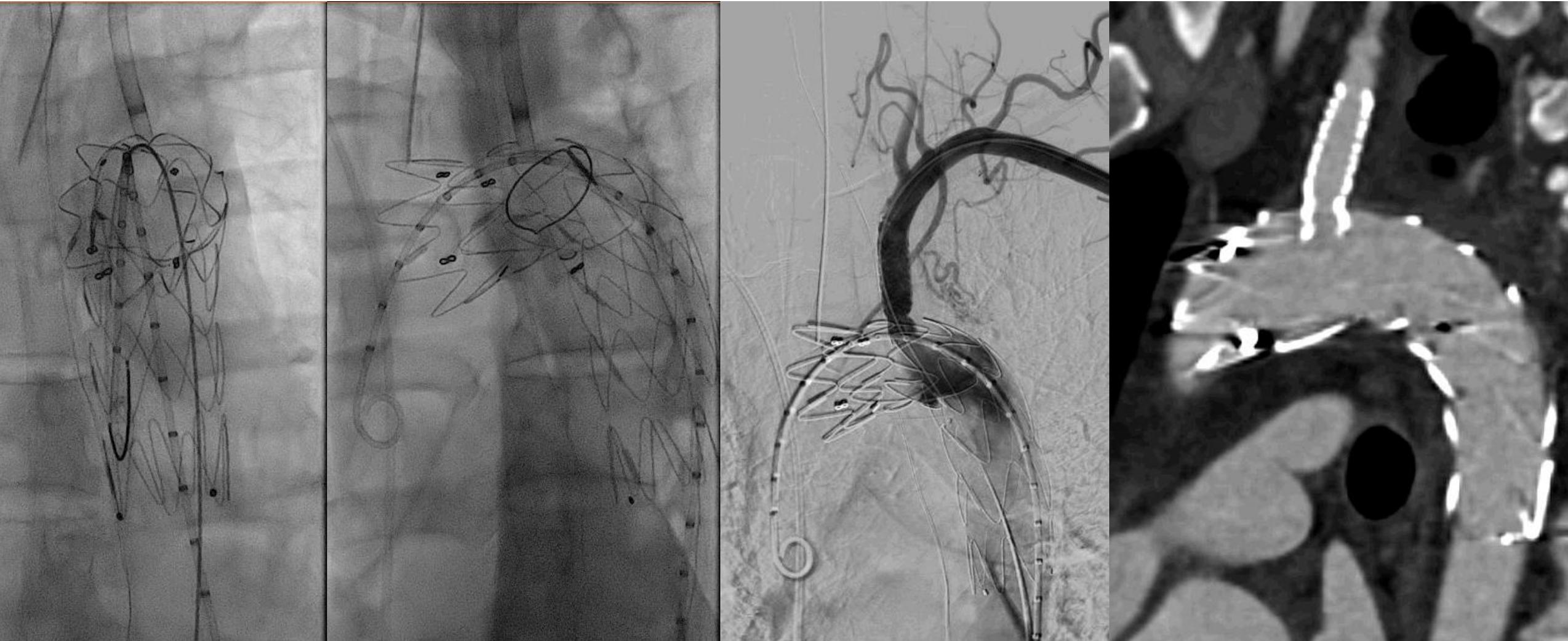
Coût +++

Délai de fabrication > 3 mois

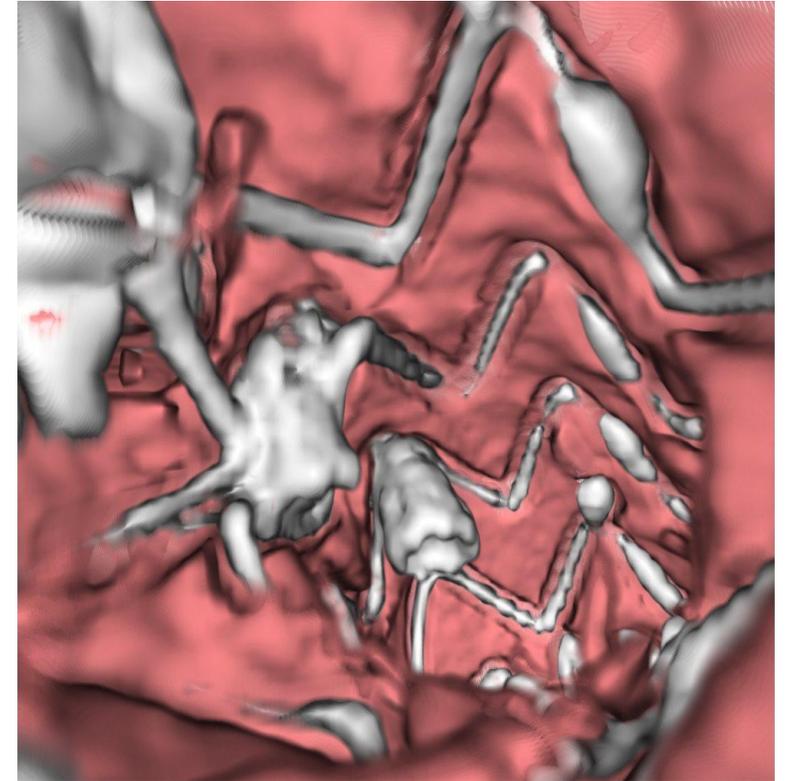
TEVAR+fenestration laser



TEVAR+fenestration laser



TEVAR+fenestrations multiples laser

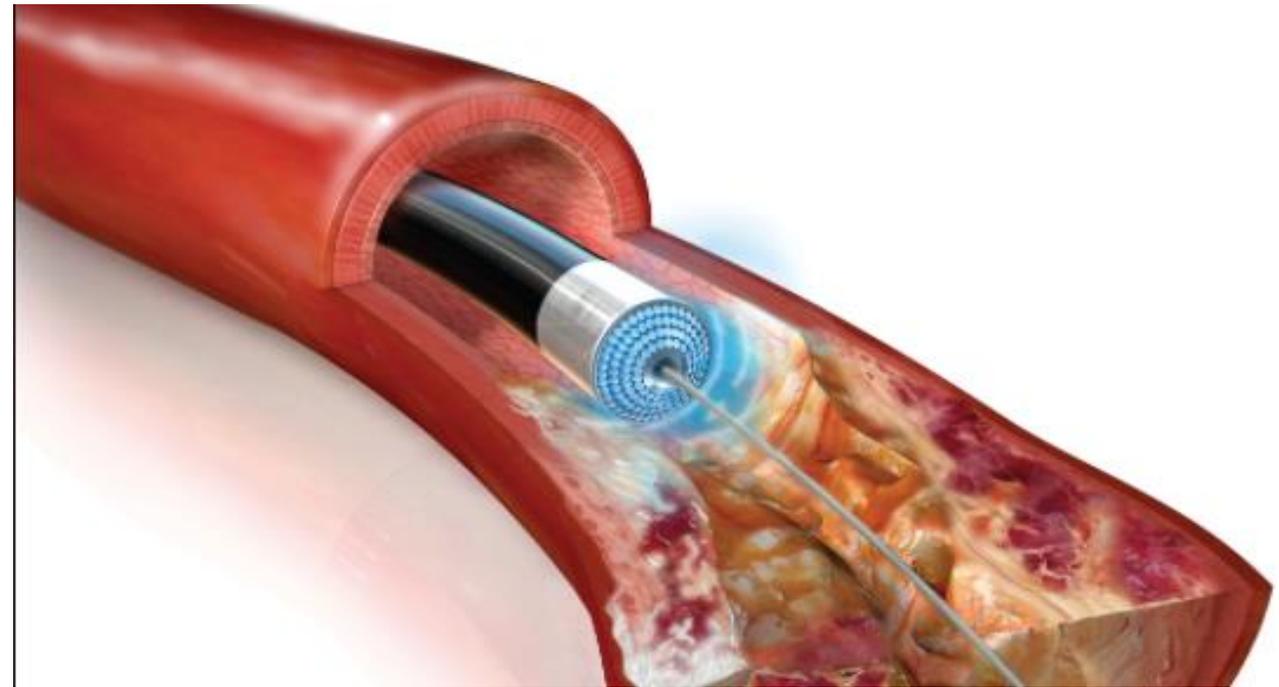


TEVAR+fenestration laser (HM n=9)

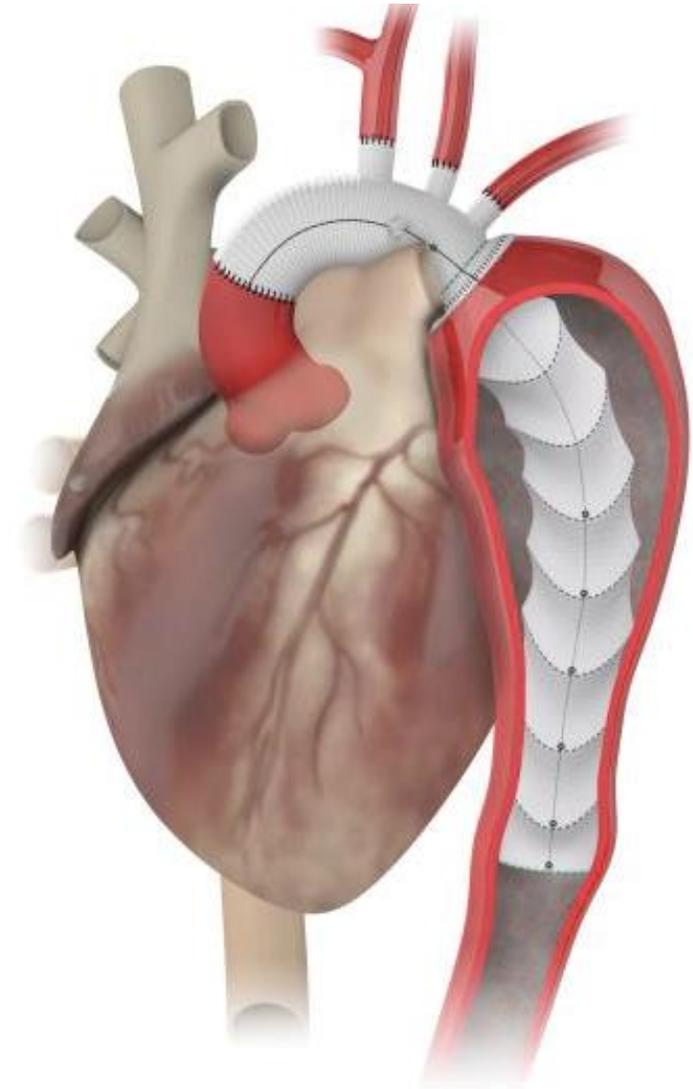
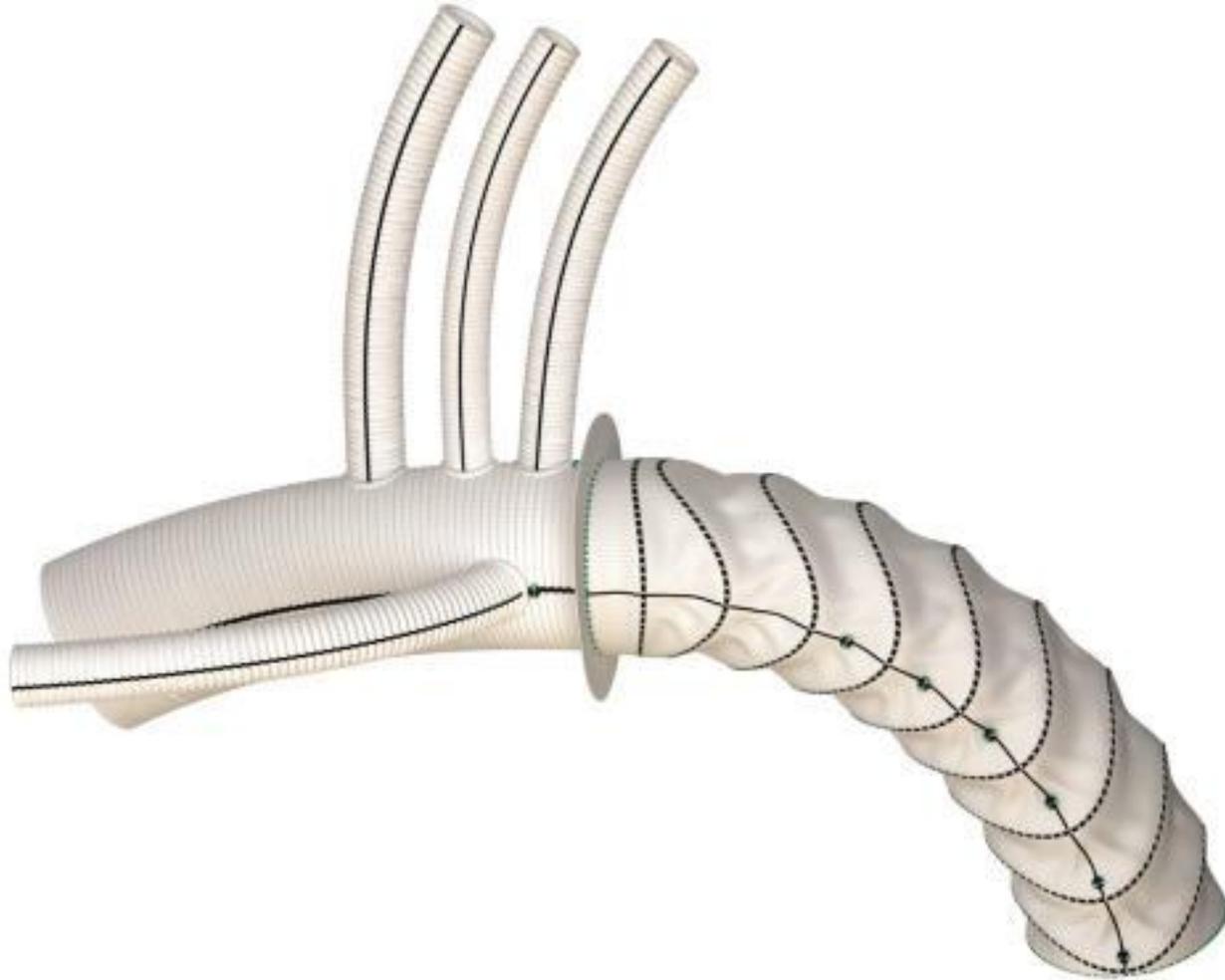
- ❖ Taux de réussite technique 100%
- ❖ Mortalité péri opératoire 1/9 =10 %%
- ❖ AVC mineur 11 %
- ❖ Pas de problème de perméabilité

Indications semi-urgentes < 2mois

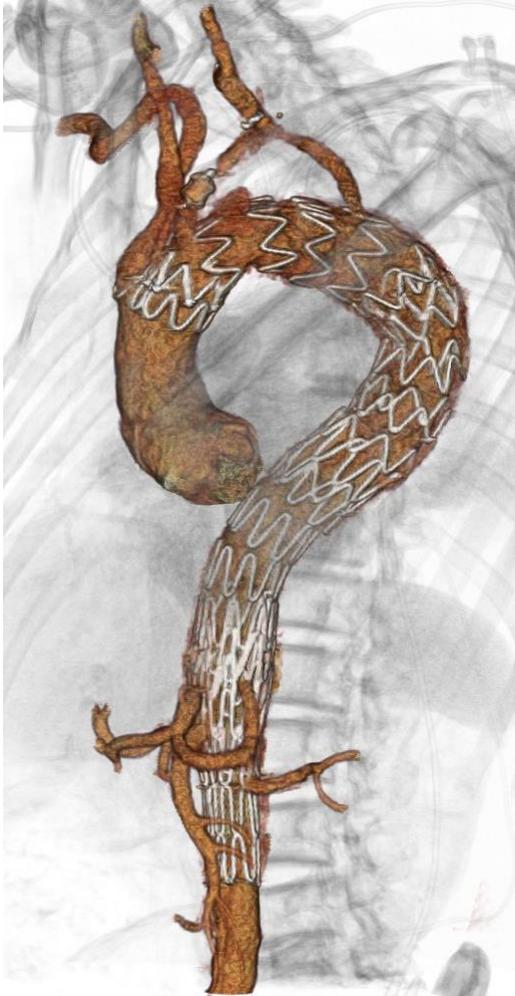
Surtout si 1 ou 2 fenestrations



Si Ao As > 38 mm → Chirurgie hybride de la
crosse par Thoraflex



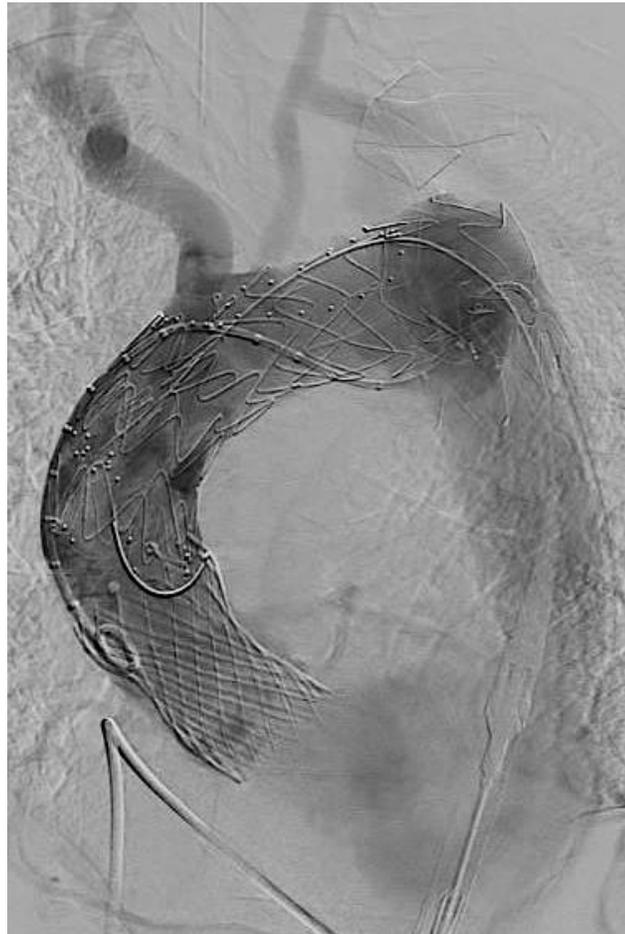
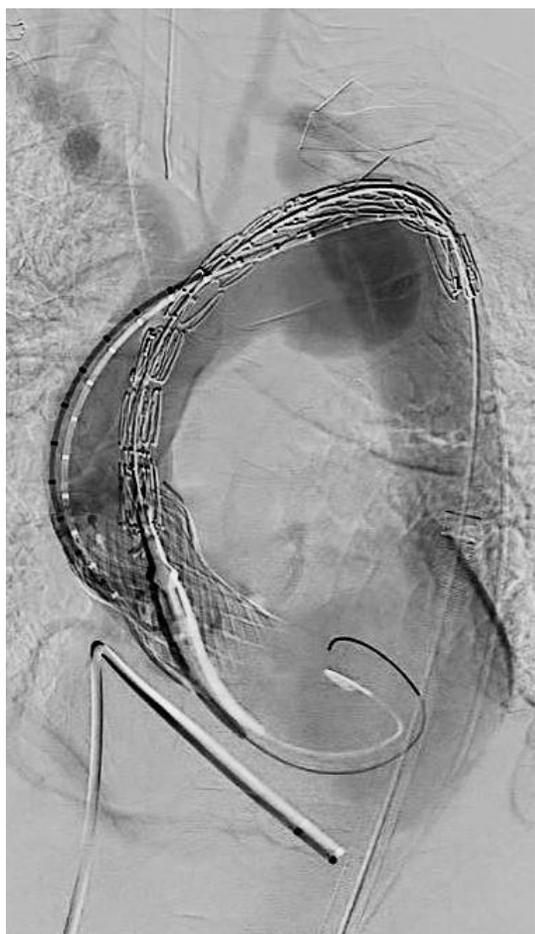
Après thoraflex, poursuite vers l'aval du traitement



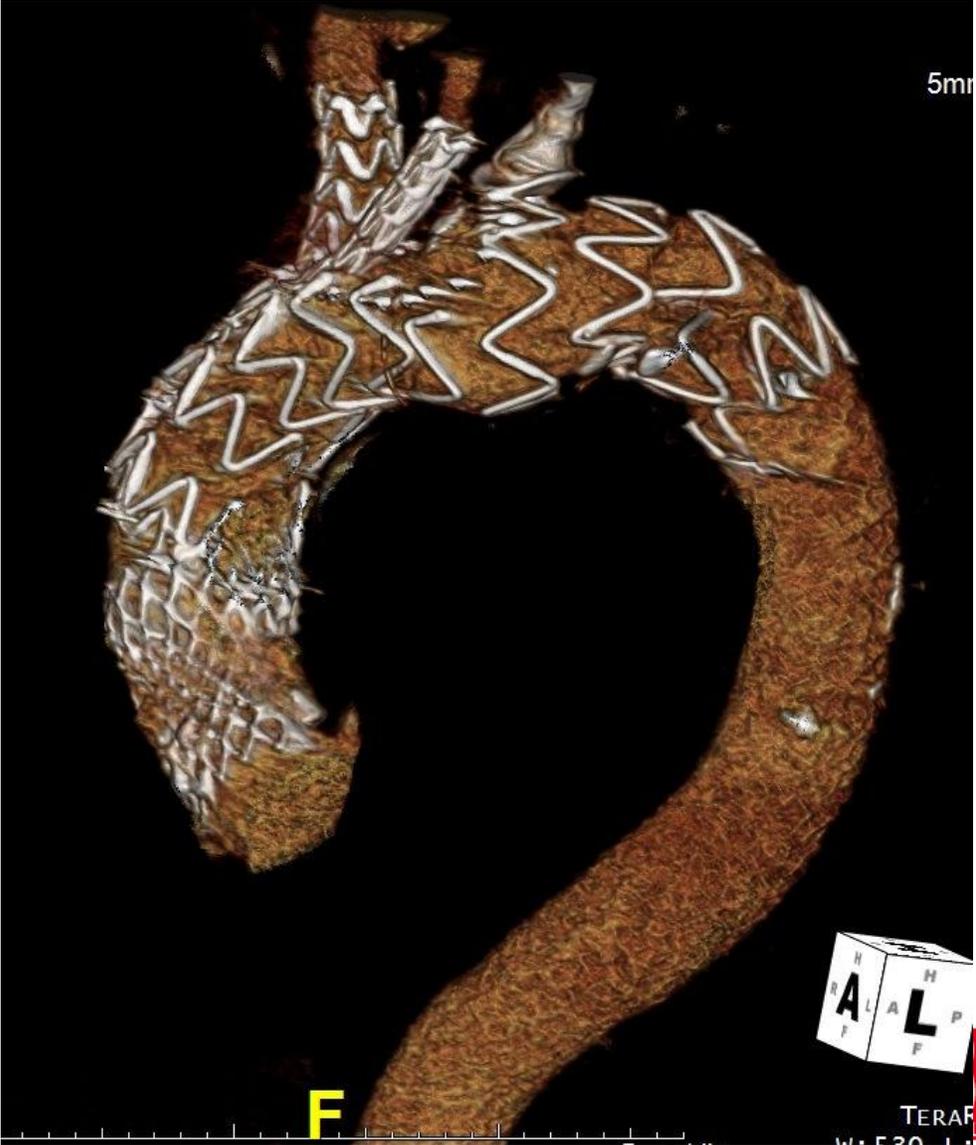
M. R.F. , 70 ans, RAC + Anévrysme sacciforme 50 mm de la crosse aortique



M. R.F. , 70 ans, RAC + Anévrisme sacciforme 50 mm de la crosse aortique

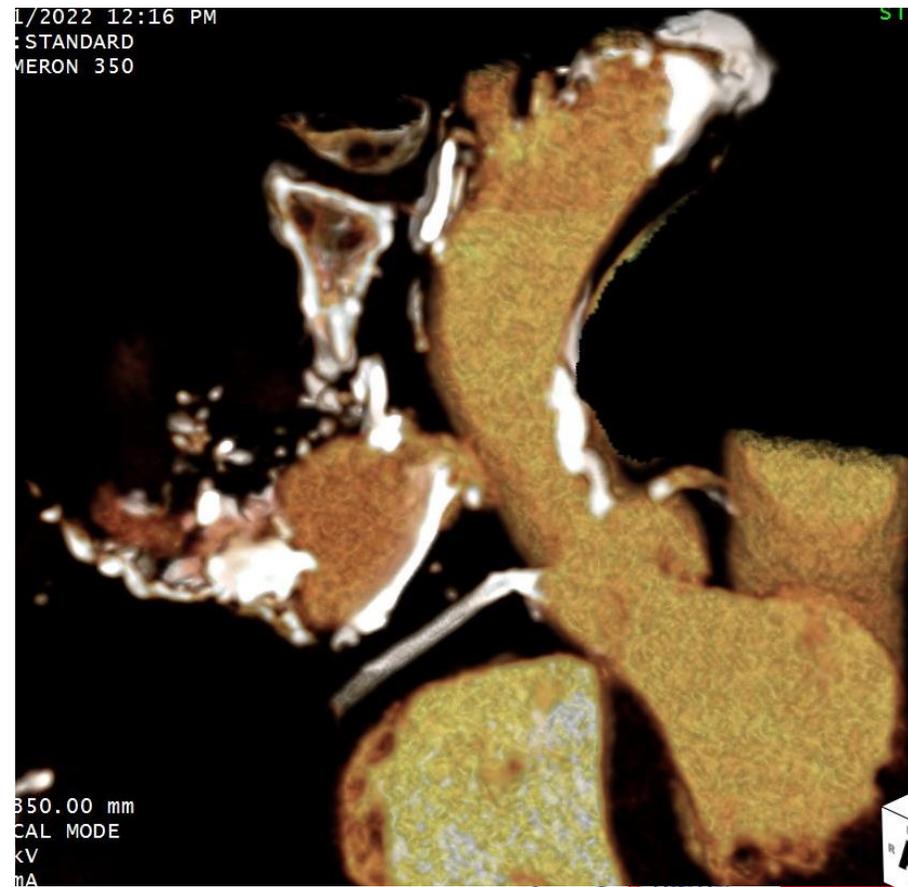
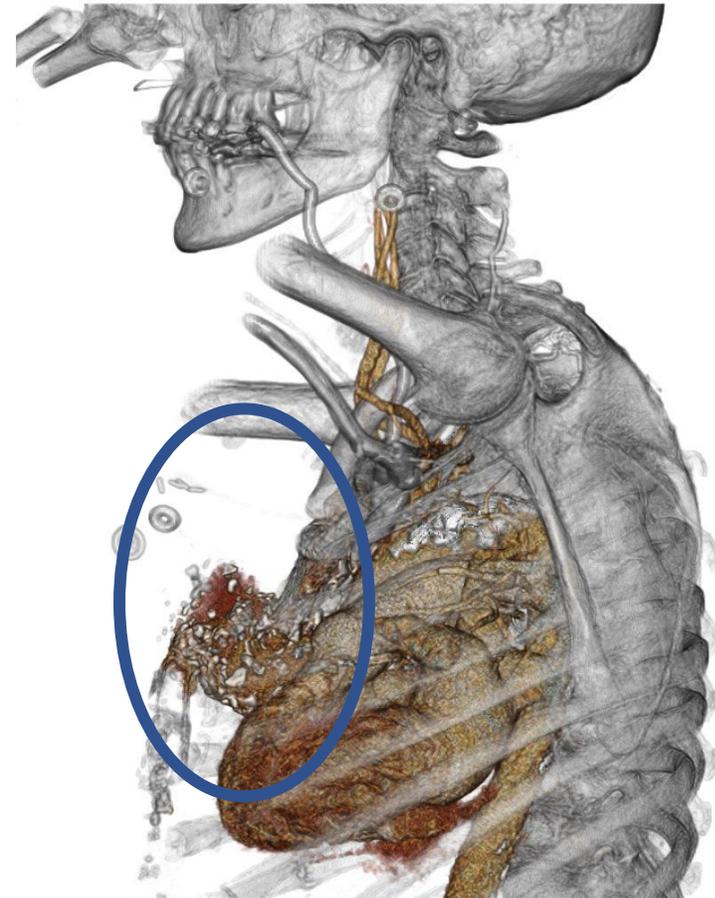


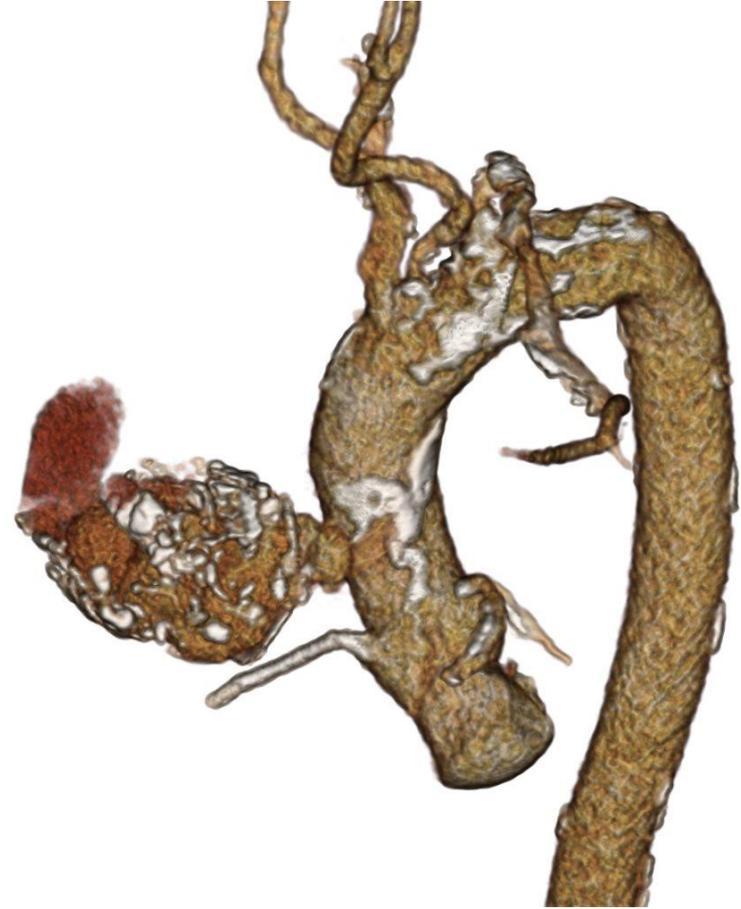
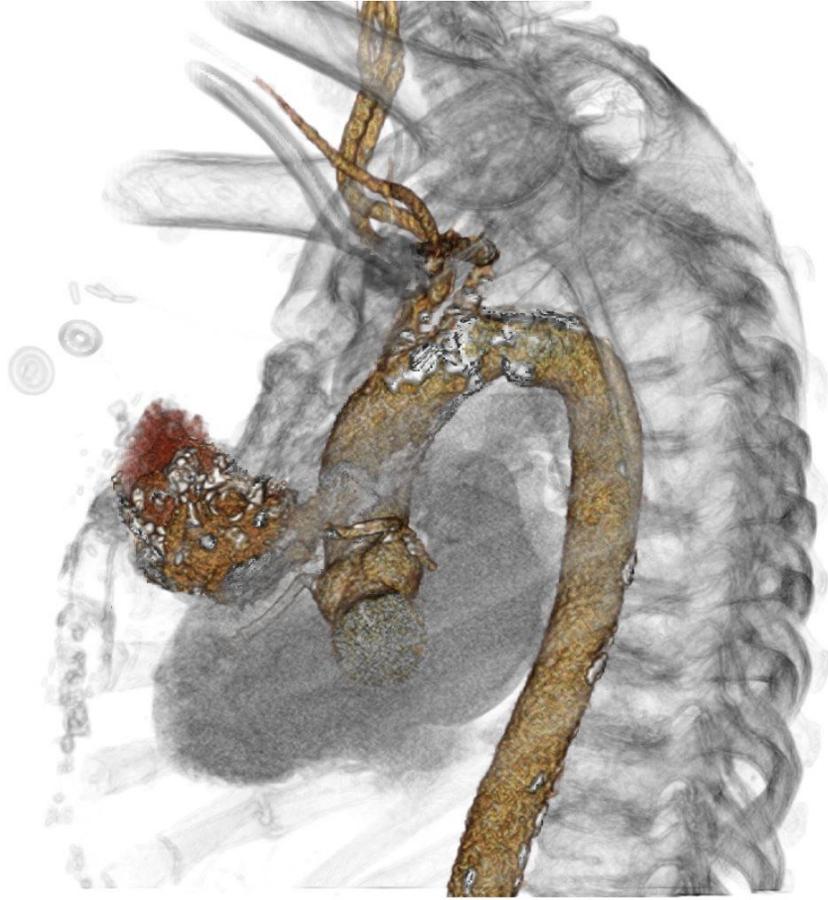
M. R.F. , 70 ans, RAC + Anévrysme sacciforme 50 mm de la crosse aortique

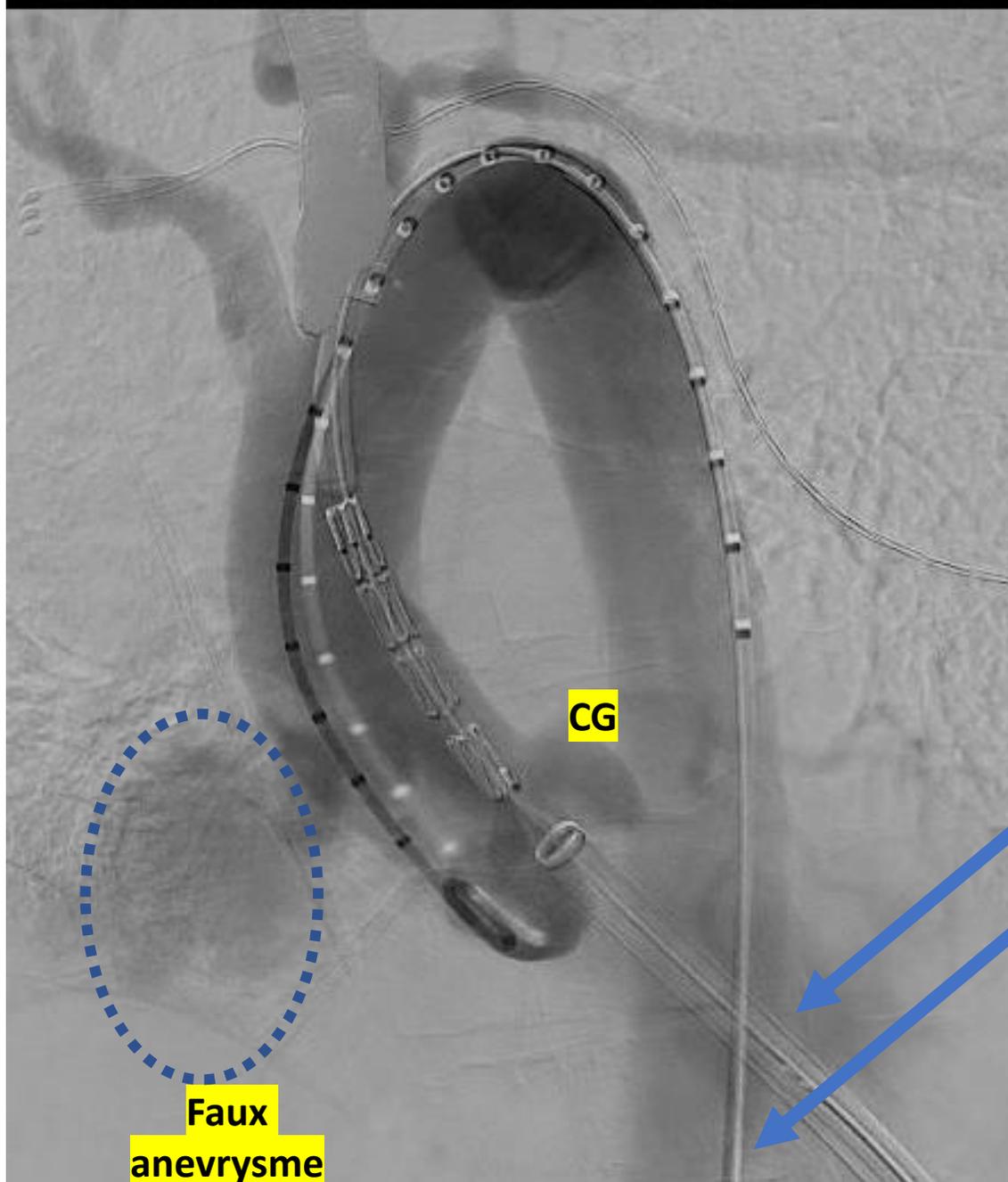


TEVAR et aorte ascendante

Fe 80 ans + K du sein droit tté par Rx → ostéonecrose sternale
radique pseudo-tumeur sternale fistulisée à l'aorte thoracique
ascendante







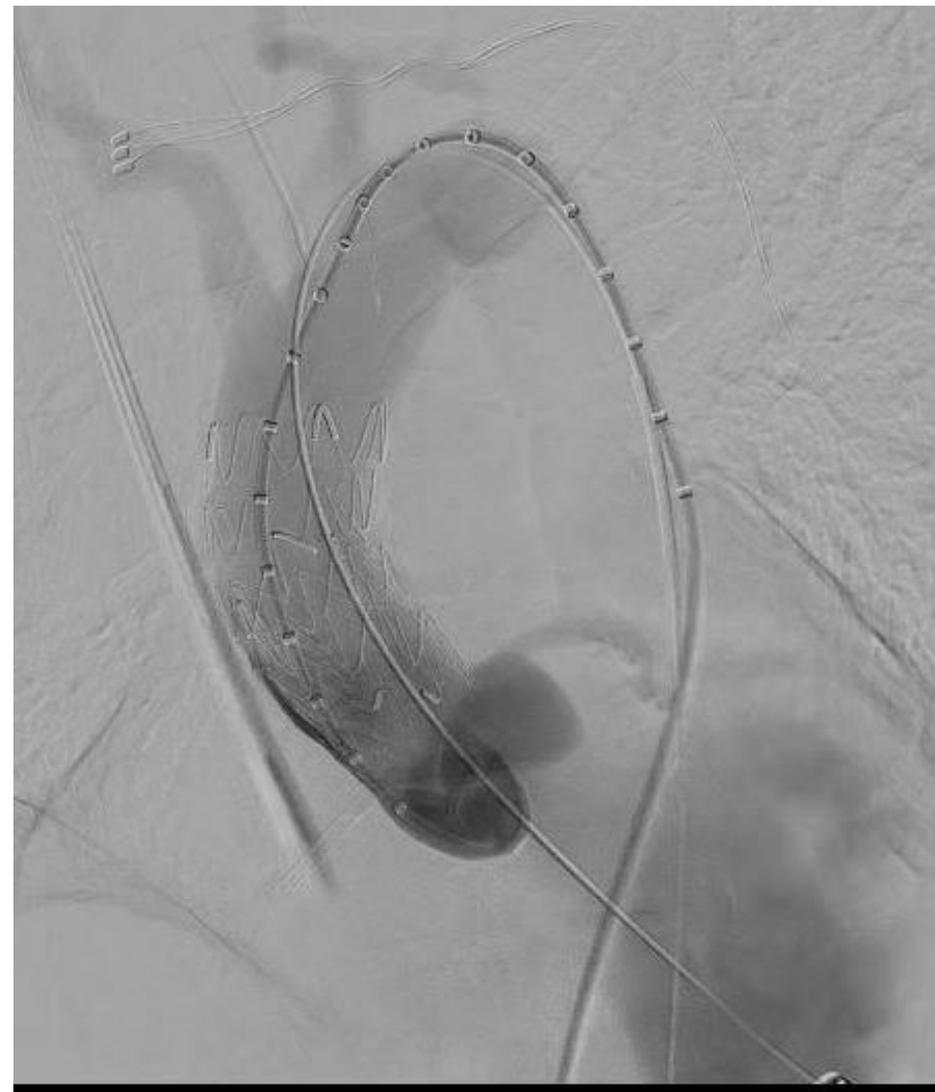
Intervention à double équipe: Chir cardiaque et Chir vasculaire

- AG
- Voie trans-apicale
- Téléphérique fémoral
- Pacing cardiaque, ETO
- Mise en place 1^{ère} endoprothèse
Ds Ao AScendante

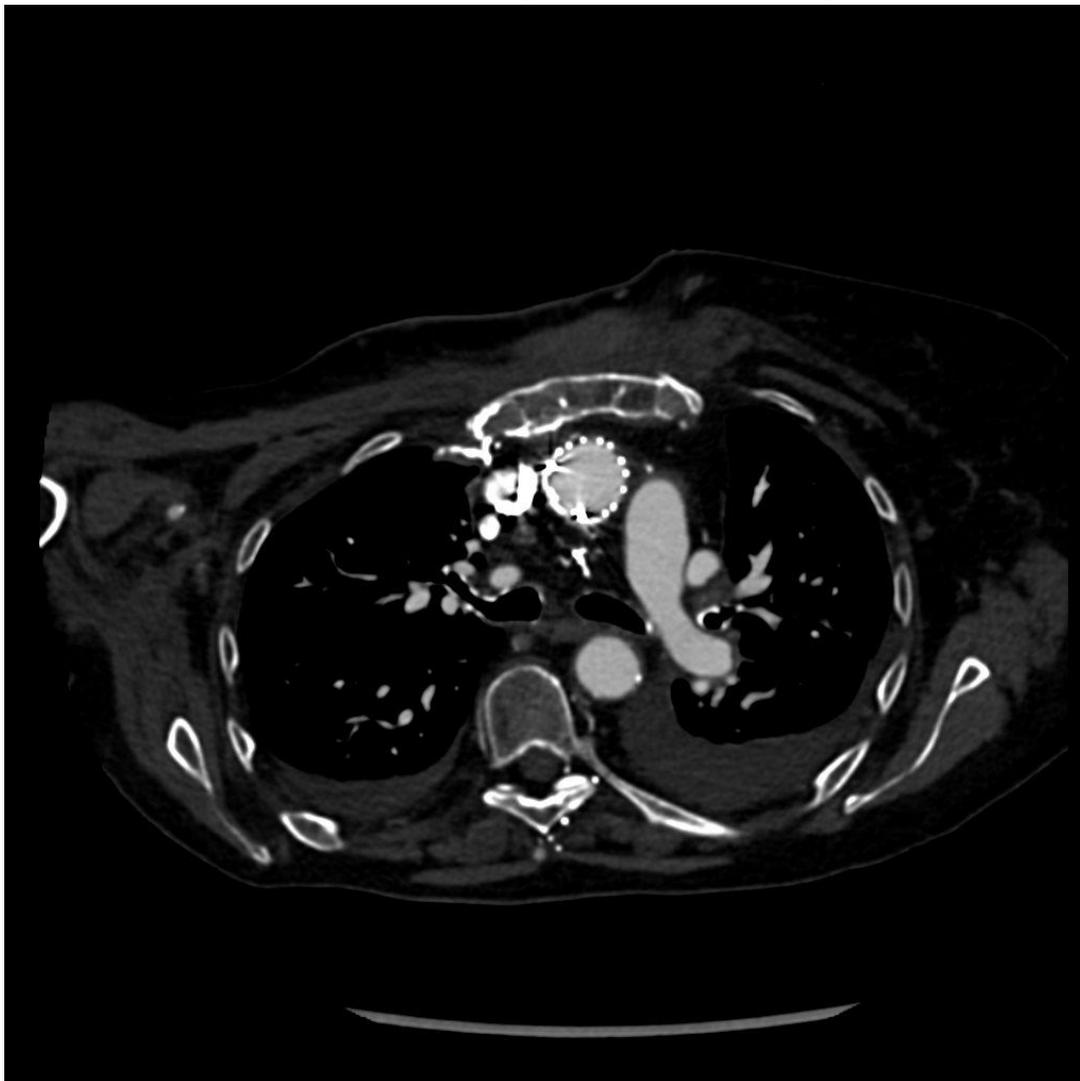
1^{ère} TEVAR



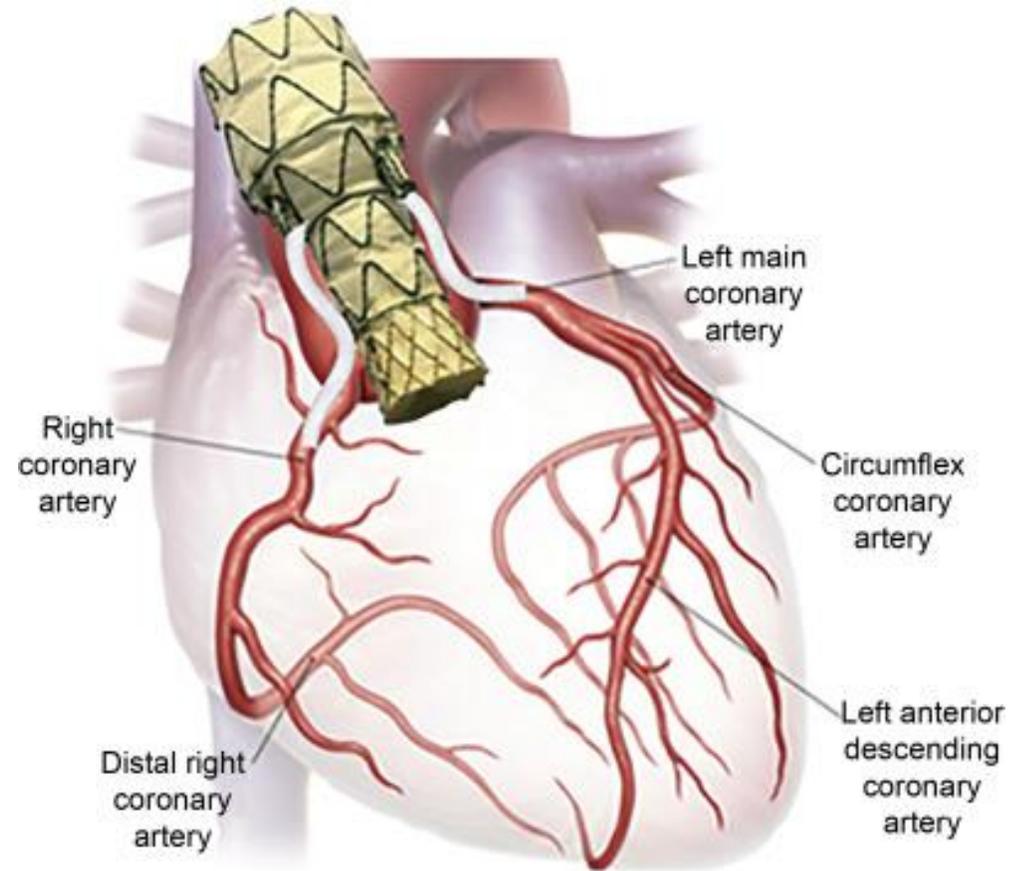
post 2^{ème} TEVAR



Mme Cl... post-op

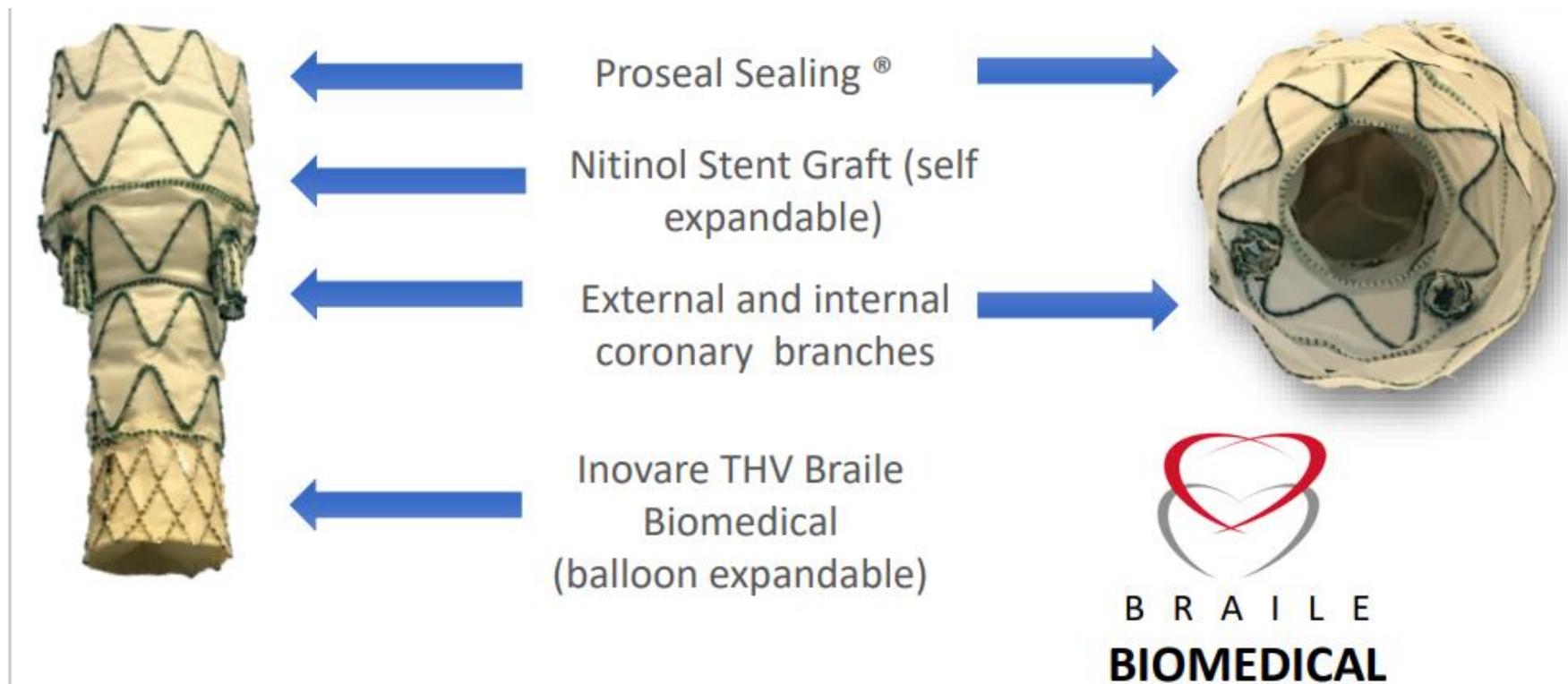


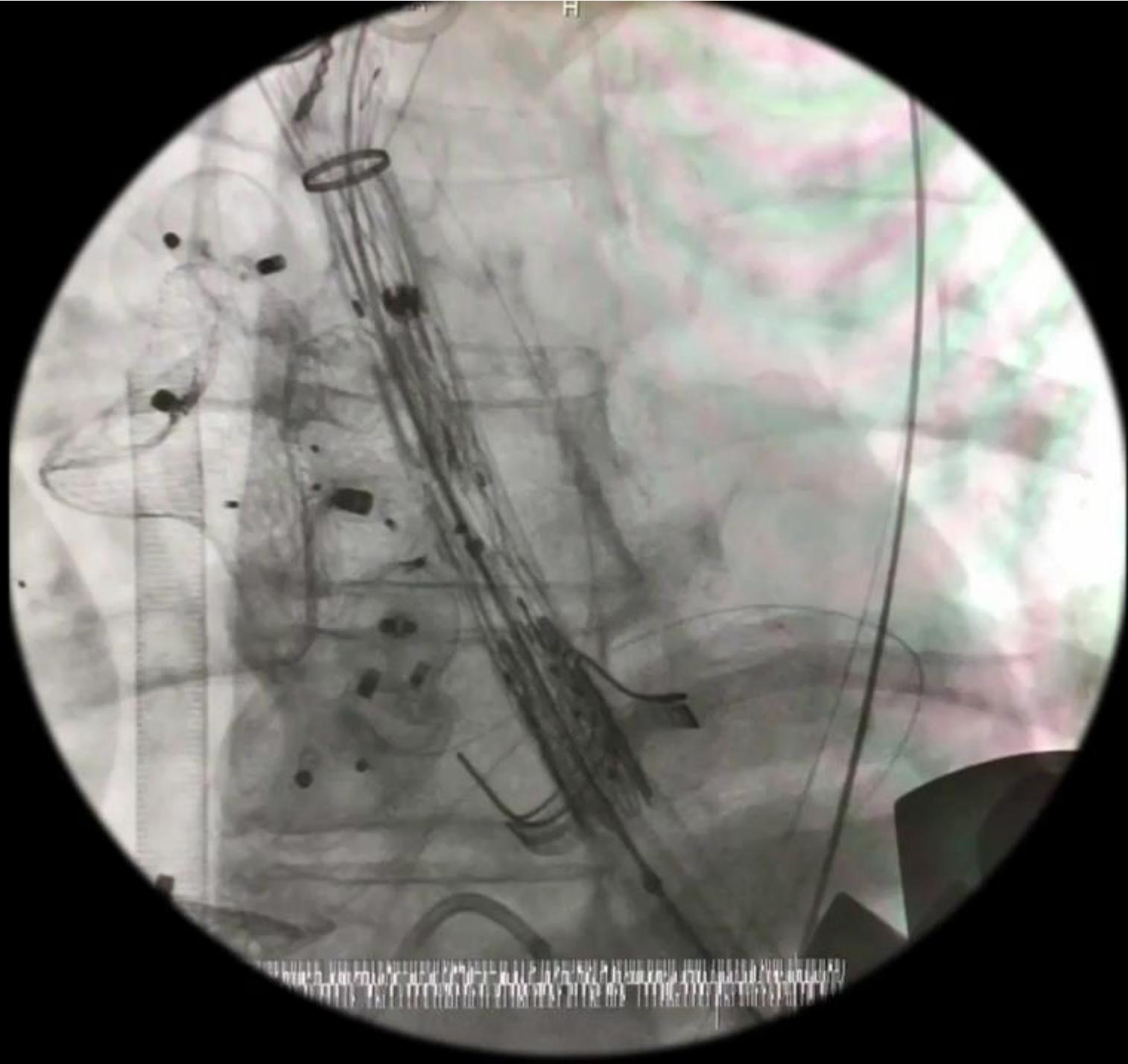
Perspective ultime? : Endobentall

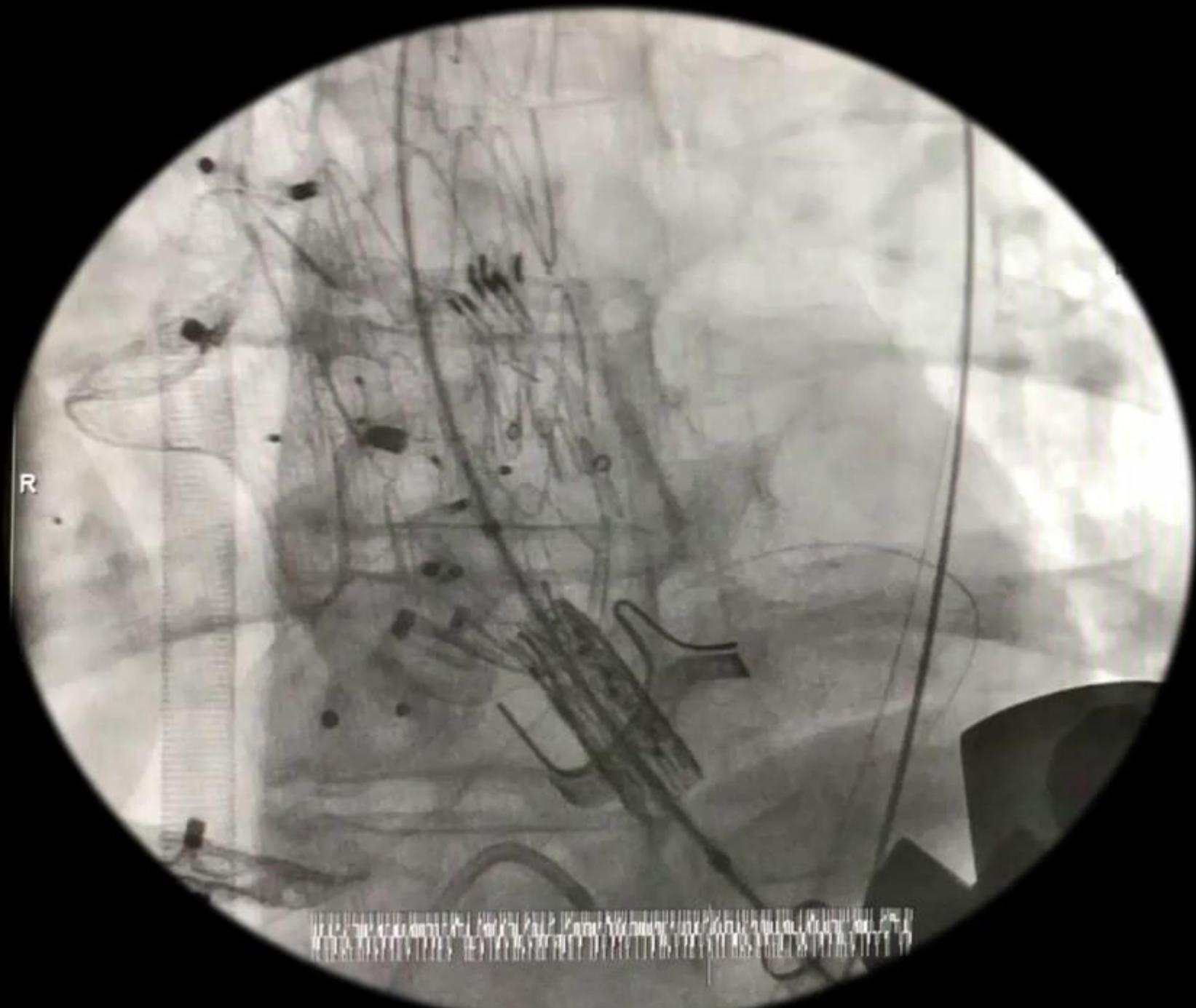


Gaia et al. , Brail Biomedica, 2020

Gala et al. first-in-human Bentall procedure

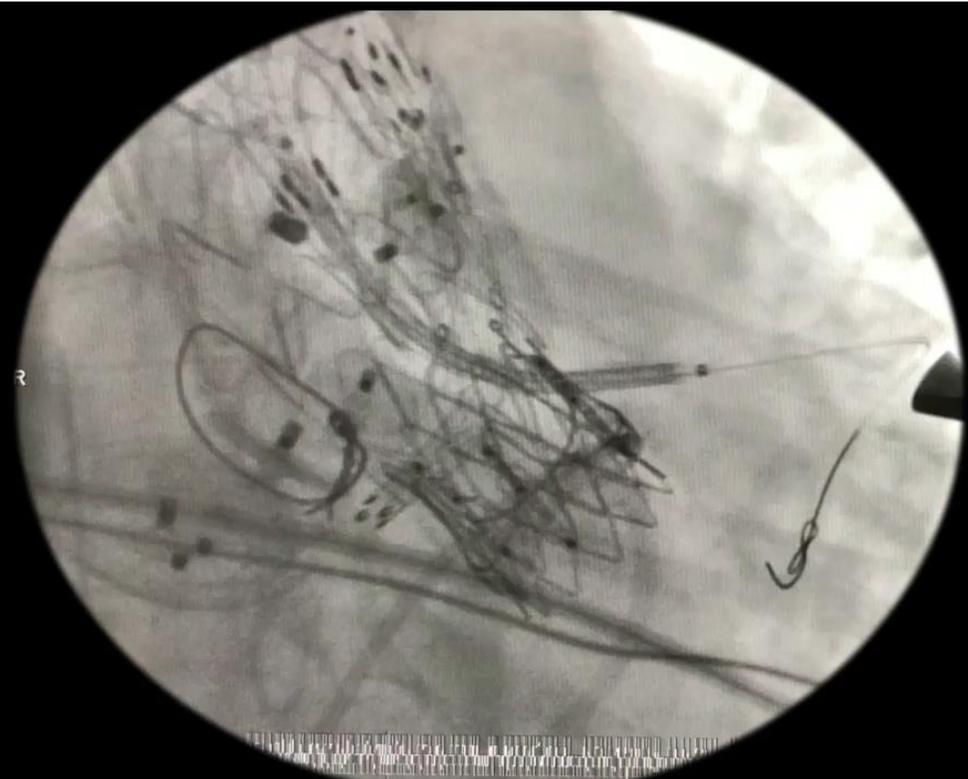
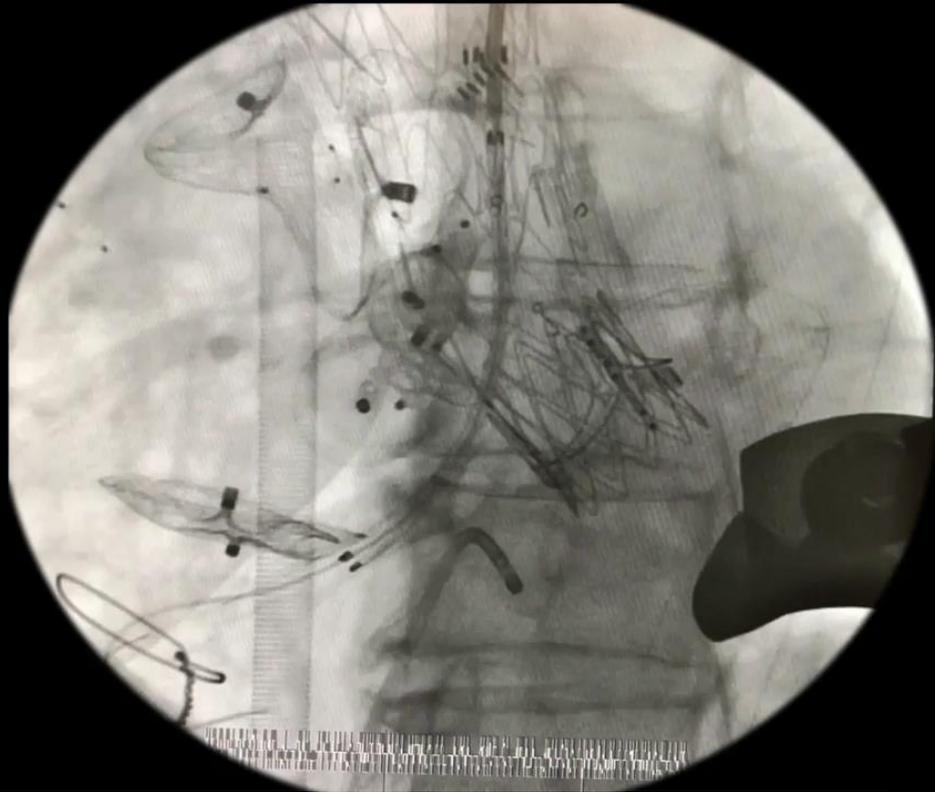




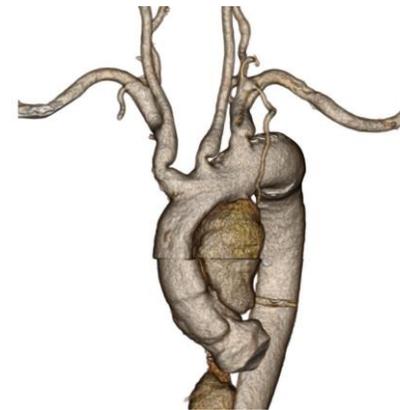
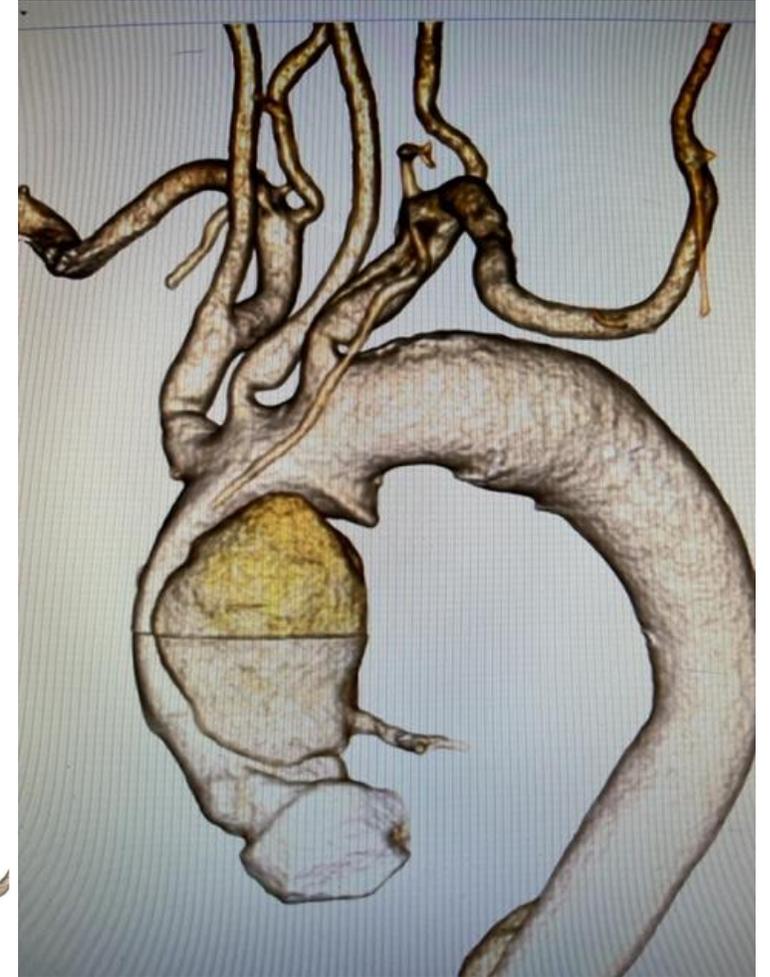


R

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400 410 420 430 440 450 460 470 480 490 500 510 520 530 540 550 560 570 580 590 600 610 620 630 640 650 660 670 680 690 700 710 720 730 740 750 760 770 780 790 800 810 820 830 840 850 860 870 880 890 900 910 920 930 940 950 960 970 980 990 1000



HM's case



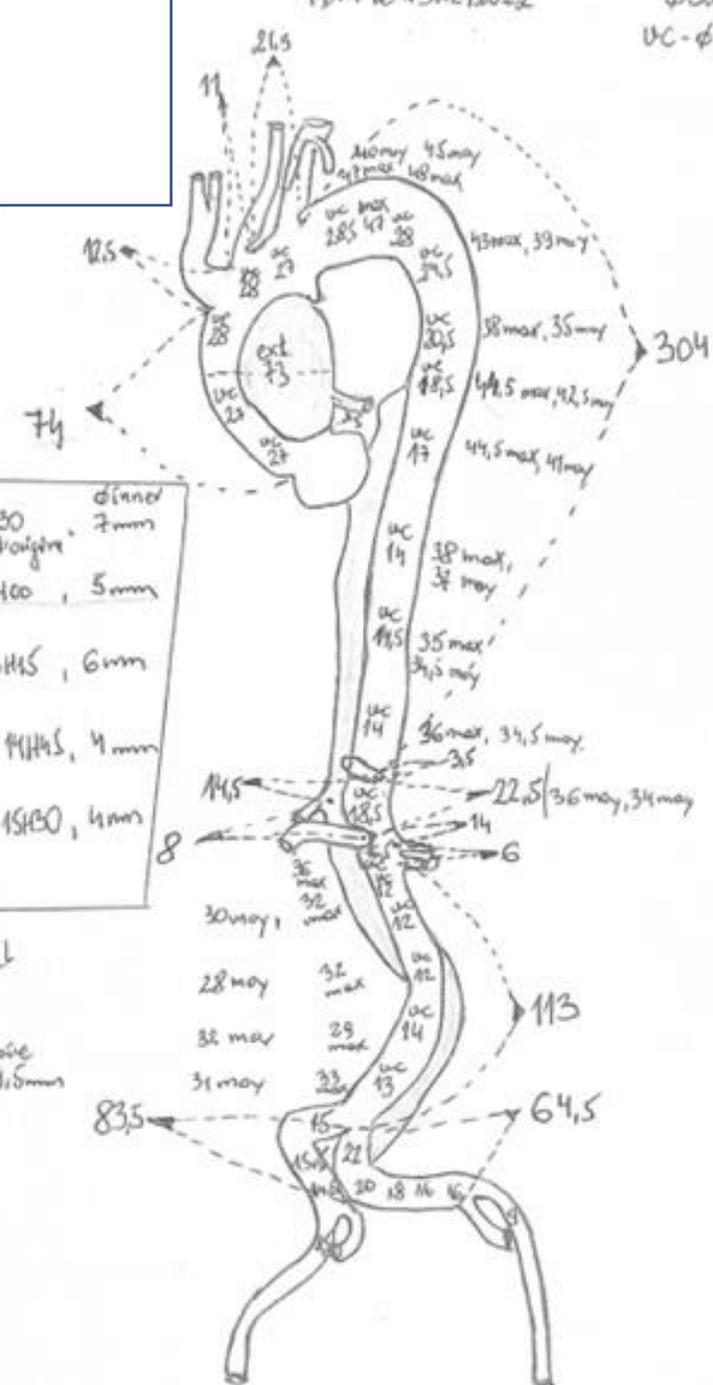
First Bentall 2006- bioprosthesis - left CABG 2020

Evolving false aneurysm

1 DM le 15/02/2022

medecines
UC - ϕ inner

DP

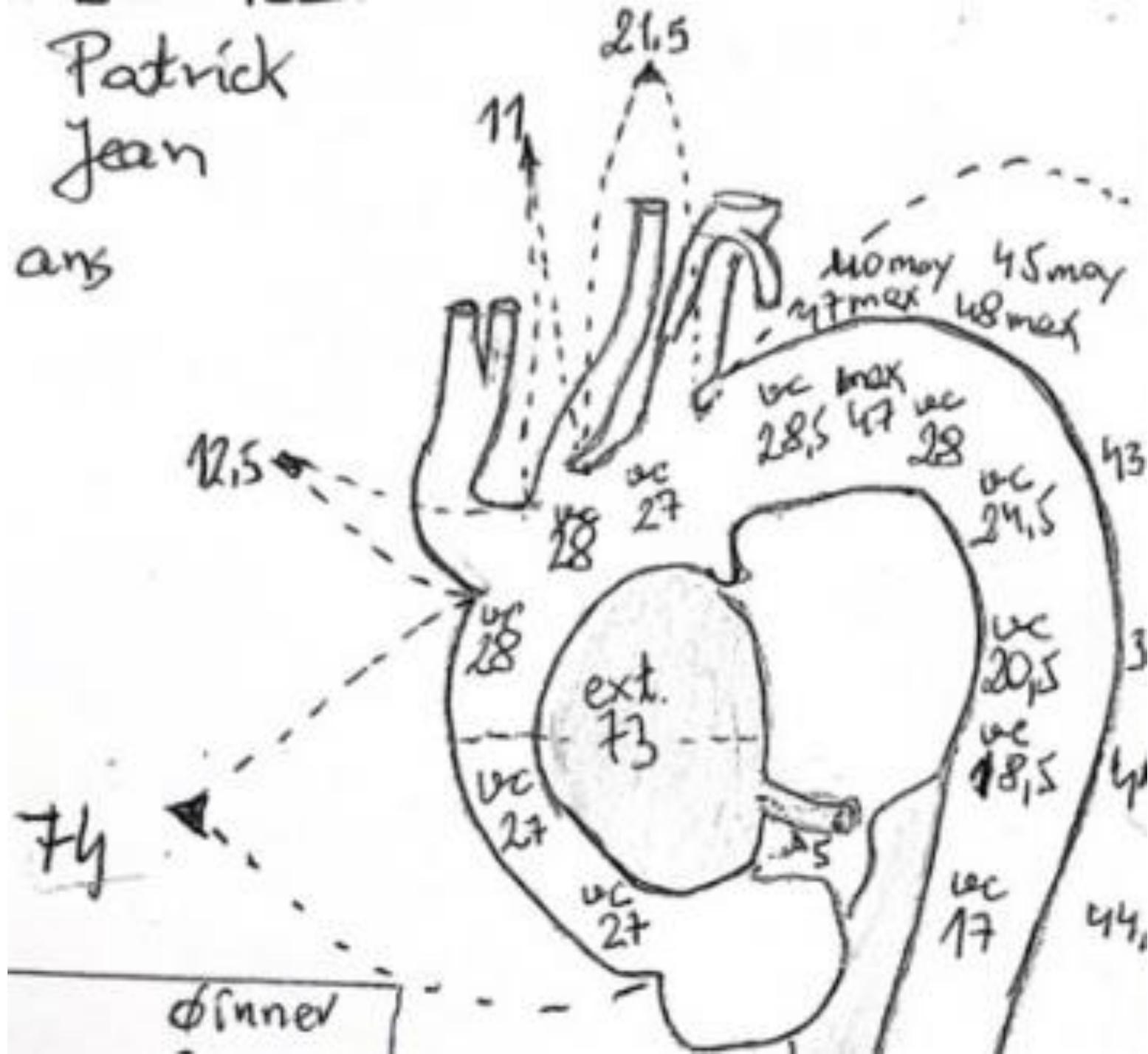


- TC 12430 ϕ inner 7mm
- ARD 10160, 5mm
- AMS 13415, 6mm
- ARG sup 11145, 4mm
- ARG inf 15160, 4mm

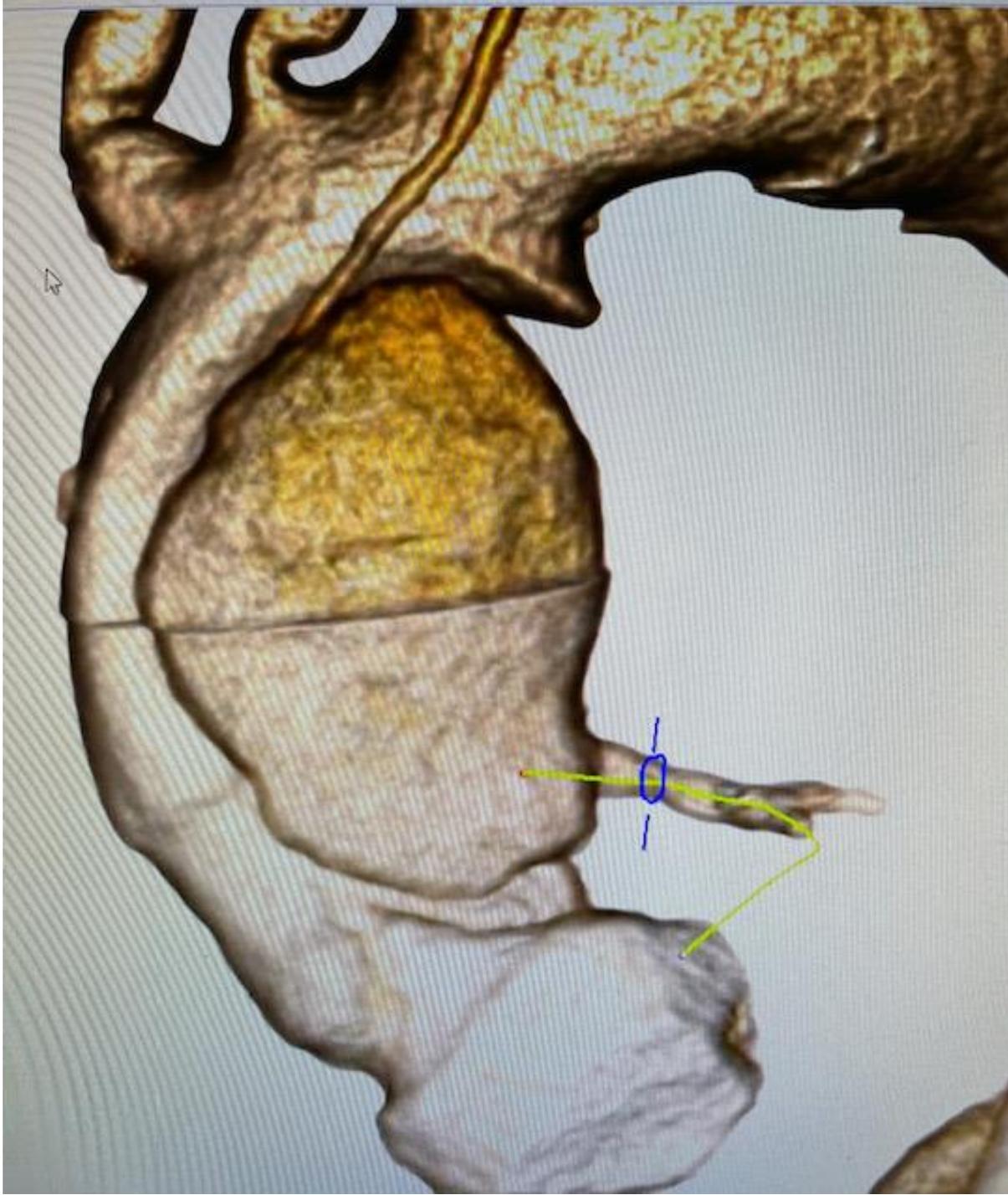
ϕ inner interdent 15mm

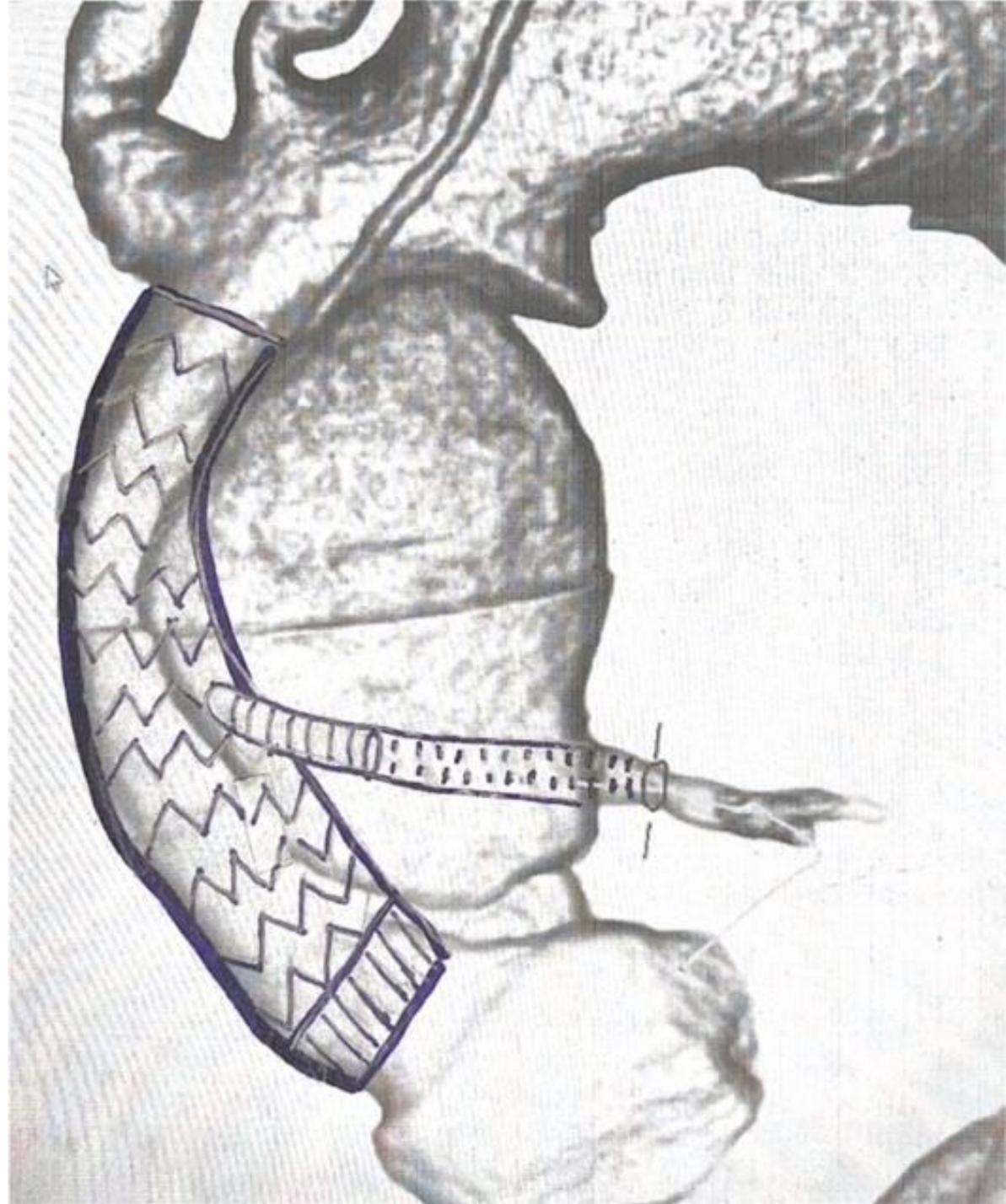
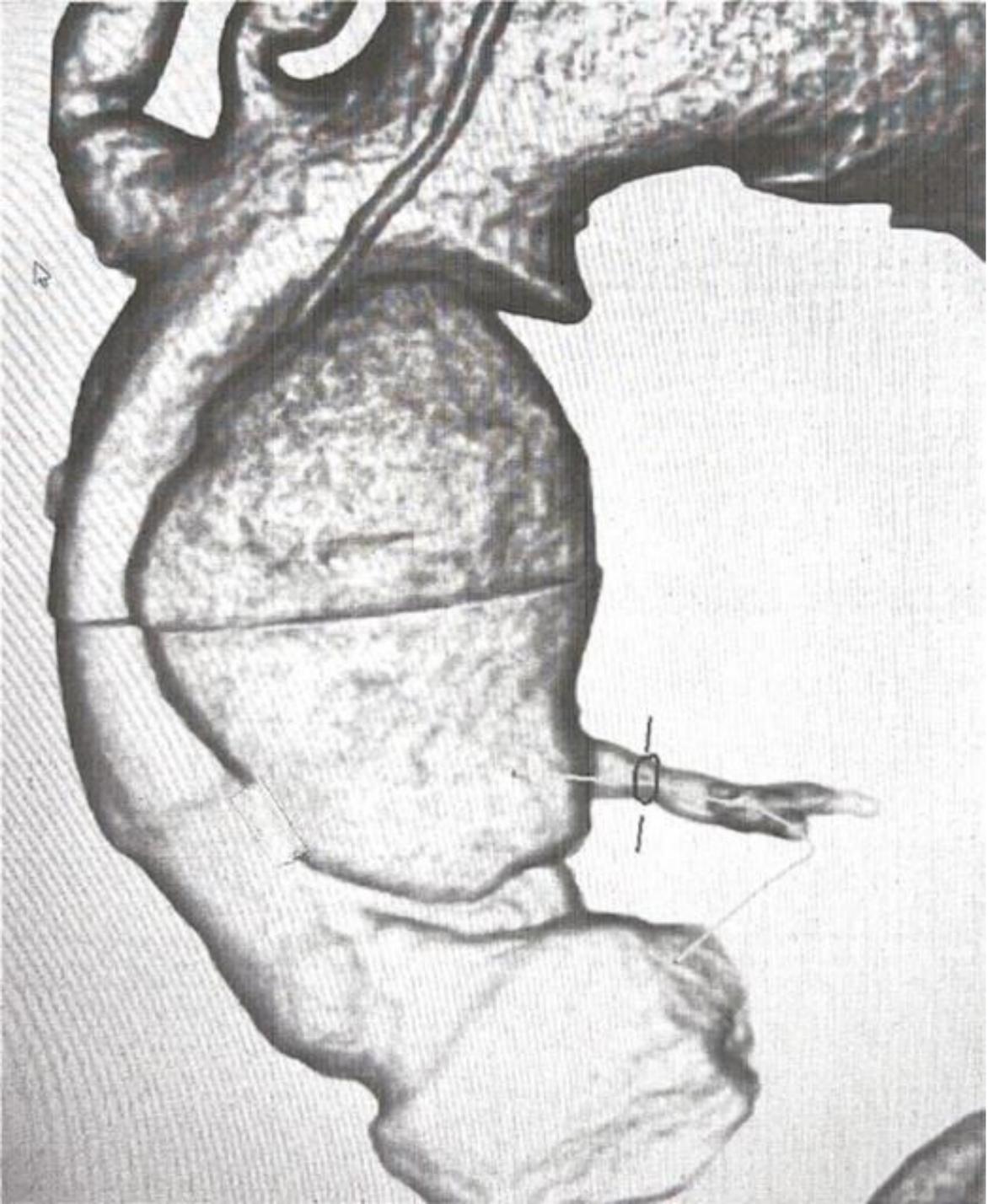
Artère coronaire Gauche = 4.5mm inner

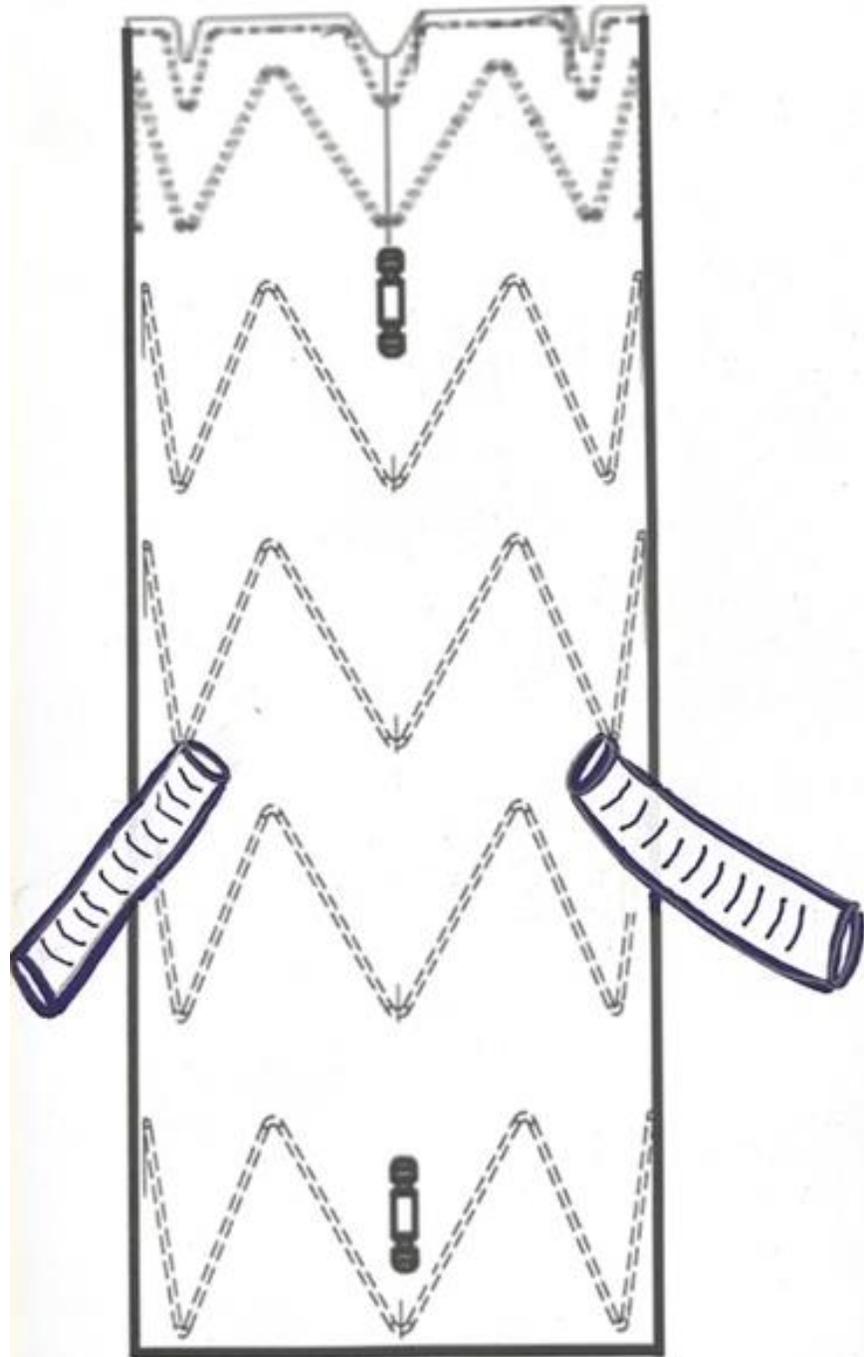
Patrick
Jean
ans



ϕ inner







Conclusion

- La combinaison des techniques ouvertes et endovasculaires permet des stratégies mieux adaptées aux lésions anévrysmales de l'aorte thoracique tout en étant moins lourdes pour le patient.
- A l'évidence, la grande variabilité des lésions, et la complexité des solutions requièrent des compétences multiples
- Notre groupe qui maîtrise l'ensemble de ces techniques a formalisé des discussions pluridisciplinaires de ces patients en incluant: **les cardiologues, les chirurgiens cardiaques, les chirurgiens vasculaires, les radiologues vasculaires ainsi que l'équipe anesthésique.**

Merci de votre attention