



## Prise en charge des Dissections Aortiques

Service de Chirurgie Vasculaire Thoracique et Transplantation (VTT), Bichat

*willy.sutter@aphp.fr*



## Lien d'intérêt

- **Aucun**



# Guidelines

## 2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease

A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines

Developed in collaboration with and endorsed by the American Association for Thoracic Surgery, American College of Radiology, Society of Cardiovascular Anesthesiologists, Society for Cardiovascular Angiography and Interventions, Society of Thoracic Surgeons, and Society for Vascular Surgery

*Endorsed by the Society of Interventional Radiology and Society for Vascular Medicine*



AMERICAN  
COLLEGE of  
CARDIOLOGY®



American  
Heart  
Association®



European Heart Journal (2014) 35, 2873–2926  
doi:10.1093/eurheartj/ehu281

ESC GUIDELINES

## 2014 ESC Guidelines on the diagnosis and treatment of aortic diseases

**Document covering acute and chronic aortic diseases of the thoracic and abdominal aorta of the adult**

**The Task Force for the Diagnosis and Treatment of Aortic Diseases of the European Society of Cardiology (ESC)**



ESC

European Society  
of Cardiology

# Classification de DeBakey (1965)

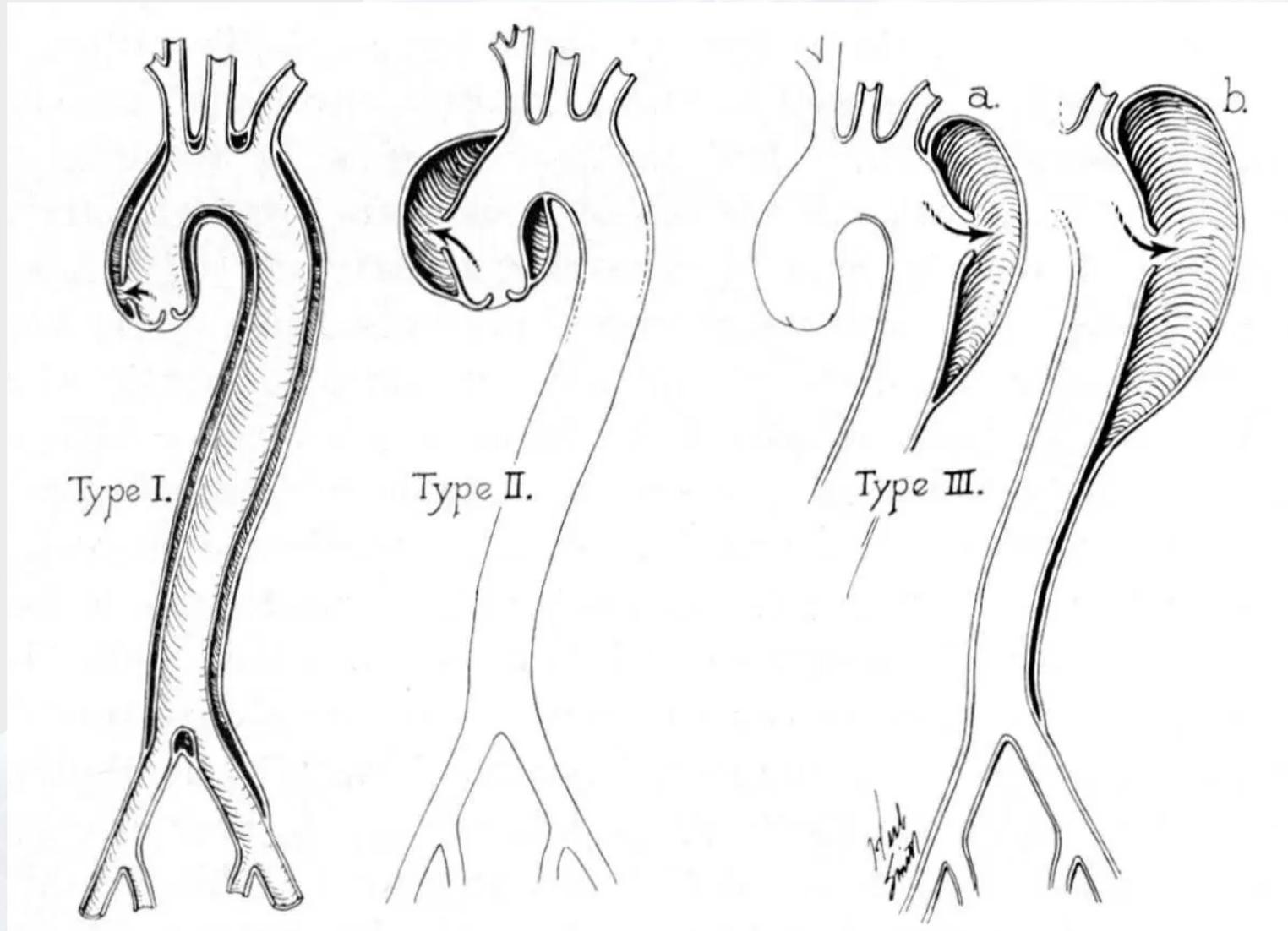
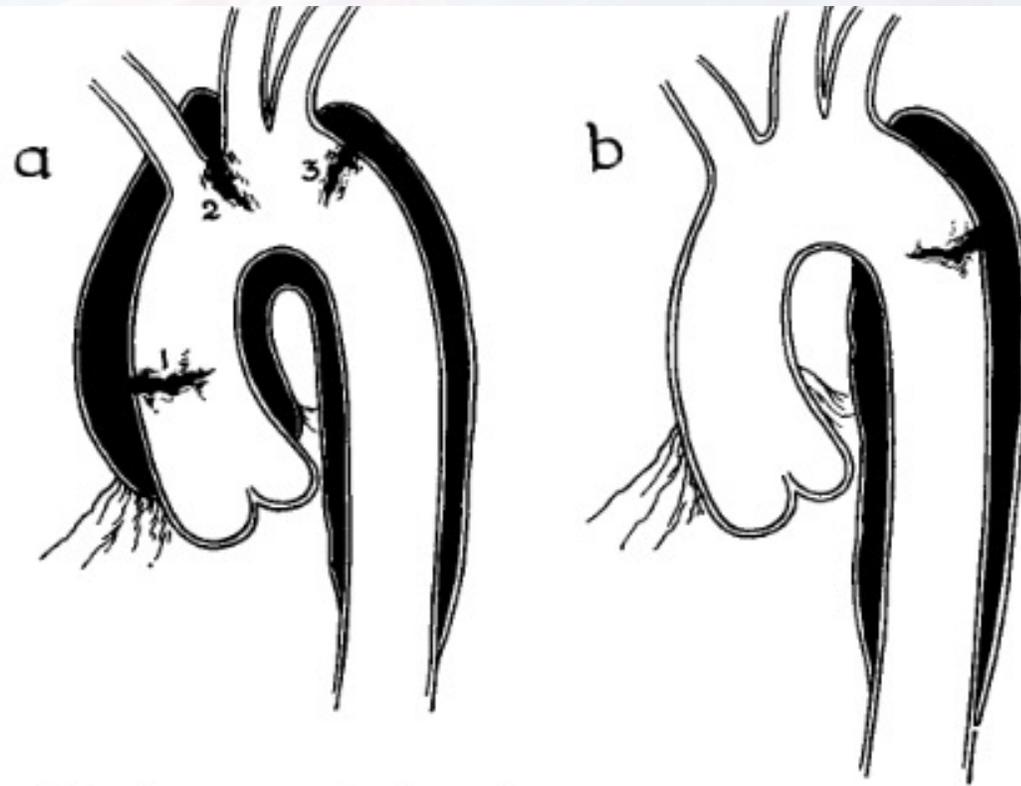


Figure in "Surgical management of dissecting aneurysms of the aorta," *Journal of Thoracic Cardiovascular Surgery*, 1965

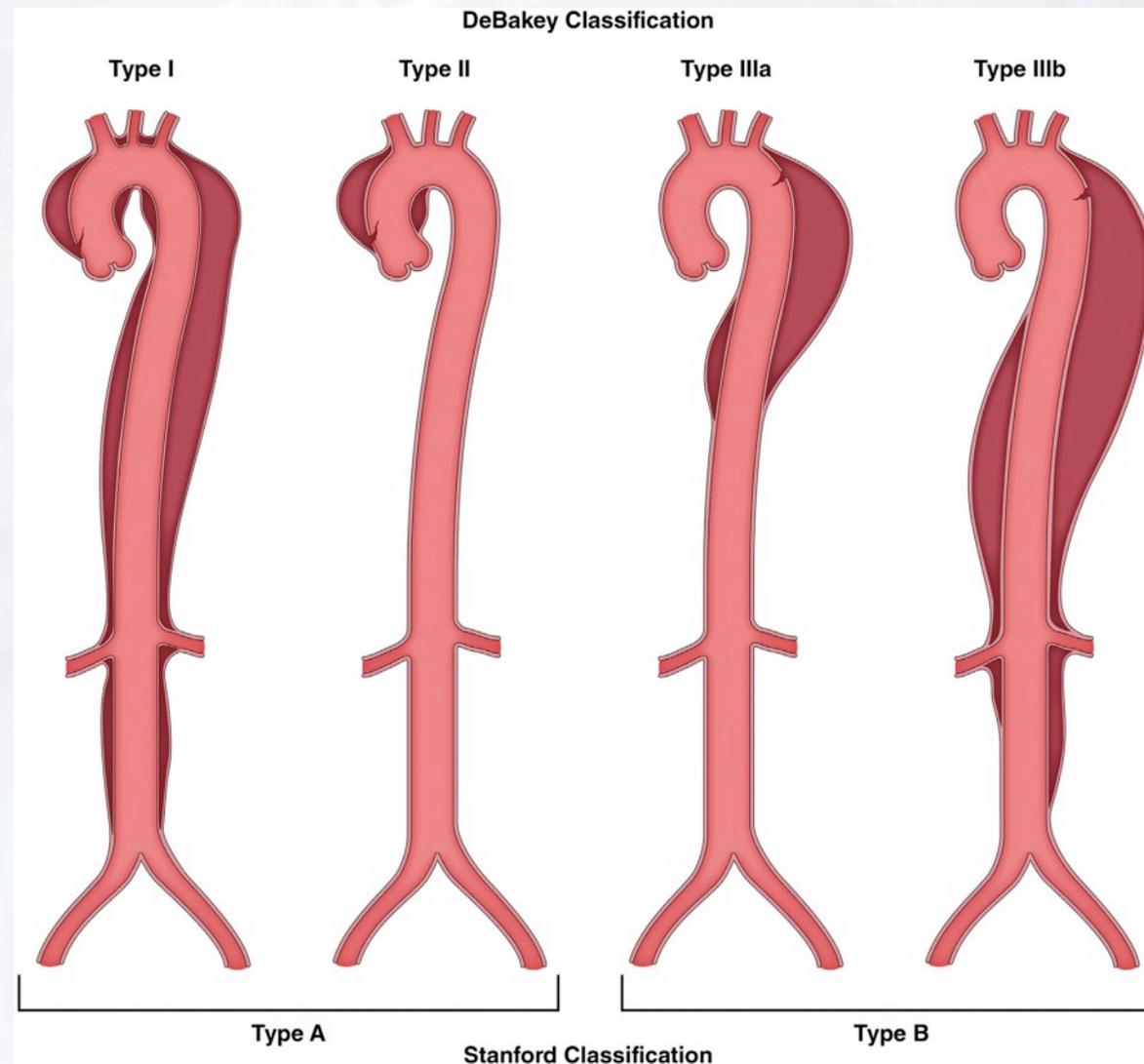
[National Library of Medicine](#)  
[MSC 582, Box 13, FF 2](#)

## Classification de Stanford (1970)



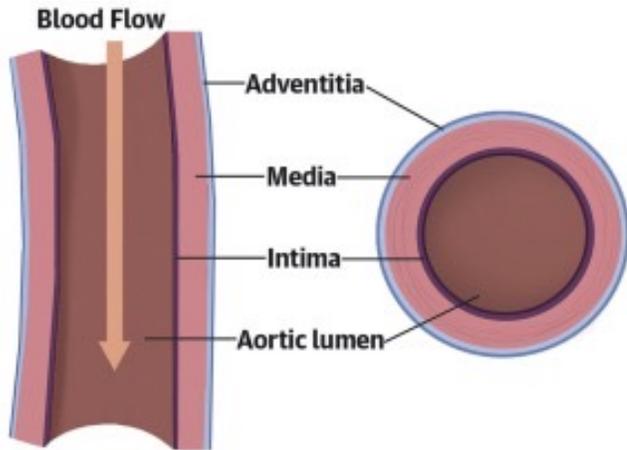
**FIG. 3.** Classification of aortic dissections. In type A the ascending aorta is dissected (a). The intimal tear has always been at position 1, but it can occur at positions 2 or 3 (see text). In type B dissection the dissection is limited to the descending aorta (b), and the intimal tear is usually within 2 to 5 cm. of the left subclavian artery.

# Classification DeBakey vs Stanford

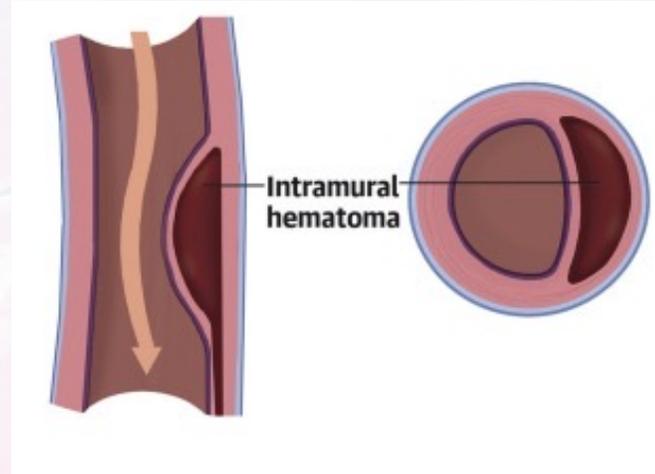


# Syndrôme Aortique Aigu

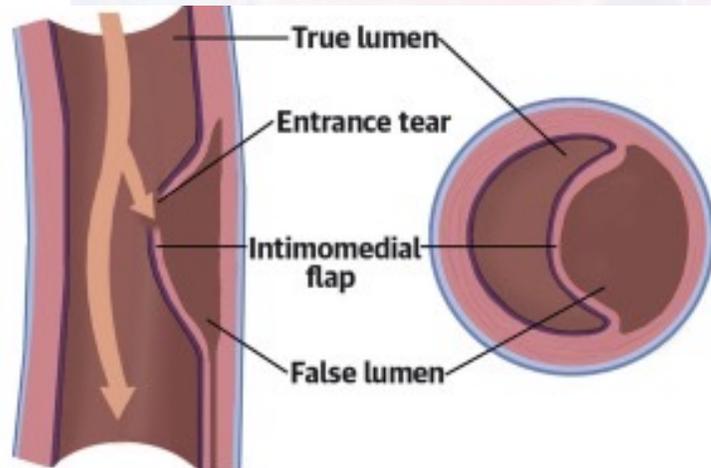
## Aorte Normale



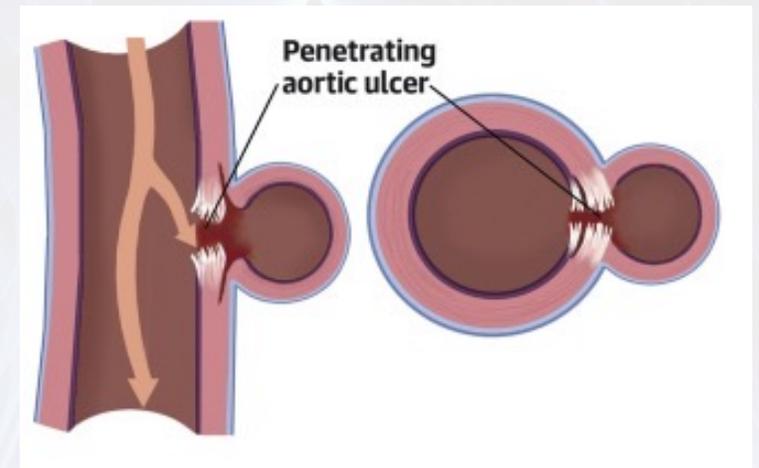
## Intra-Mural Hematoma (IMH)



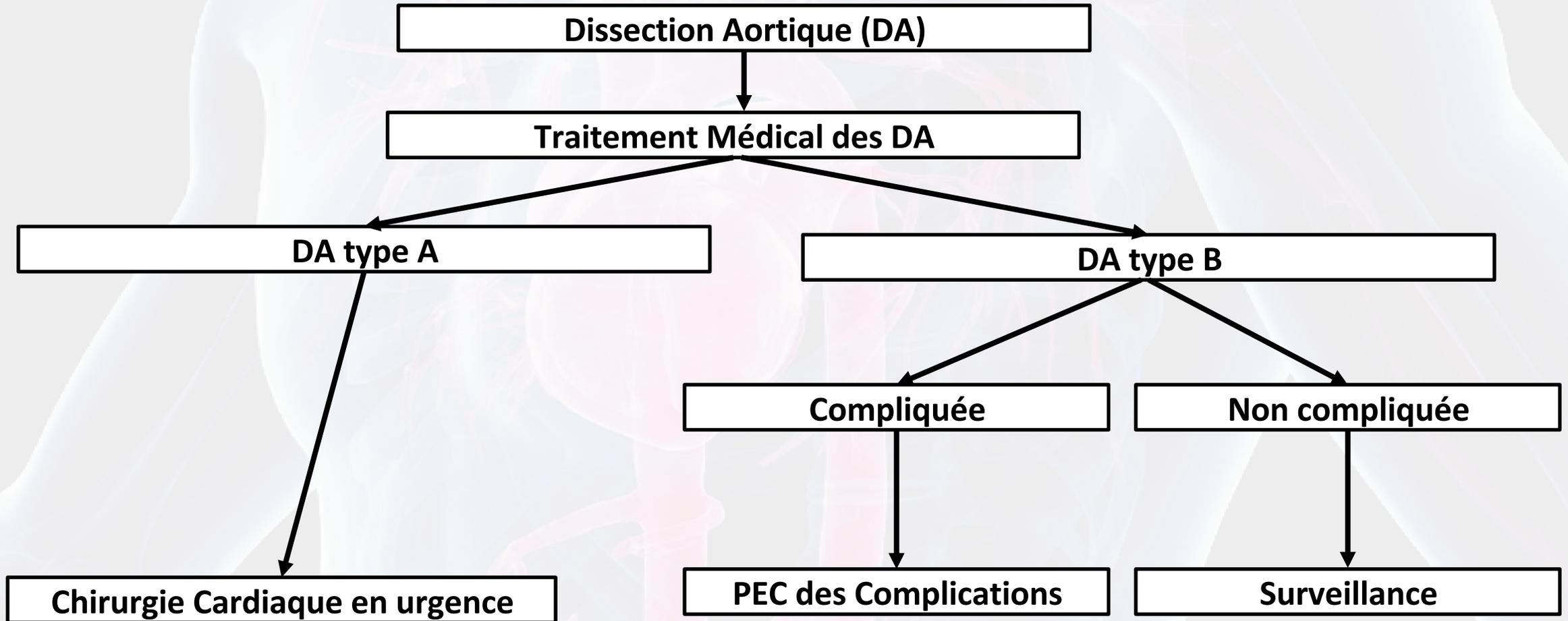
## Classic Dissection (CD)



## Penetrating Aortic Ulcer (PAU)



# Principe de PEC des Dissections Aortiques aiguës



# Traitement medical des Dissections Aortiques

- Centre Aortique de haut volume
- Unité de Soins intensifs
- Contrôle Hémodynamique :
  - PAS < 120 mmHg
  - FC 60-80 bpm
- BB IV en 1ère Intention
- Vasodilatateur si nécessaire
- Traitement de la douleur

COR	LOE	RECOMMENDATIONS
1	B-NR	1. In patients presenting to the hospital with AAS, prompt treatment with anti-impulse therapy with invasive monitoring of BP with an arterial line in an ICU setting is recommended as initial treatment to decrease aortic wall stress. <sup>1-5</sup>
1	C-LD	2. Patients with AAS should be treated to an SBP <120 mm Hg or to lowest BP that maintains adequate end-organ perfusion, as well as to a target heart rate of 60 to 80 bpm. <sup>3,6</sup>
1	B-NR	3. In patients with AAS, initial management should include intravenous beta blockers, except in patients with contraindications. <sup>2,5,7</sup>
2a	B-NR	In those with contraindications or intolerance to beta blockers, initial management with an intravenous non-dihydropyridine calcium channel blocker is reasonable for heart rate control. <sup>1,2,5</sup>
1	C-LD	4. In patients with AAS, initial management should include intravenous vasodilators if the BP is not well controlled after initiation of intravenous beta-blocker therapy. <sup>8</sup>
1	C-EO	5. Patients with AAS should be treated with pain control, as needed, to help with hemodynamic management.

# Principe du traitement chirurgical des DTA

Urgence chirurgicale +++ : quasiment aucune exception

Exclure la porte d'entrée & remettre en charge le vrai chenal

Par les **Chirurgiens Cardiaques**

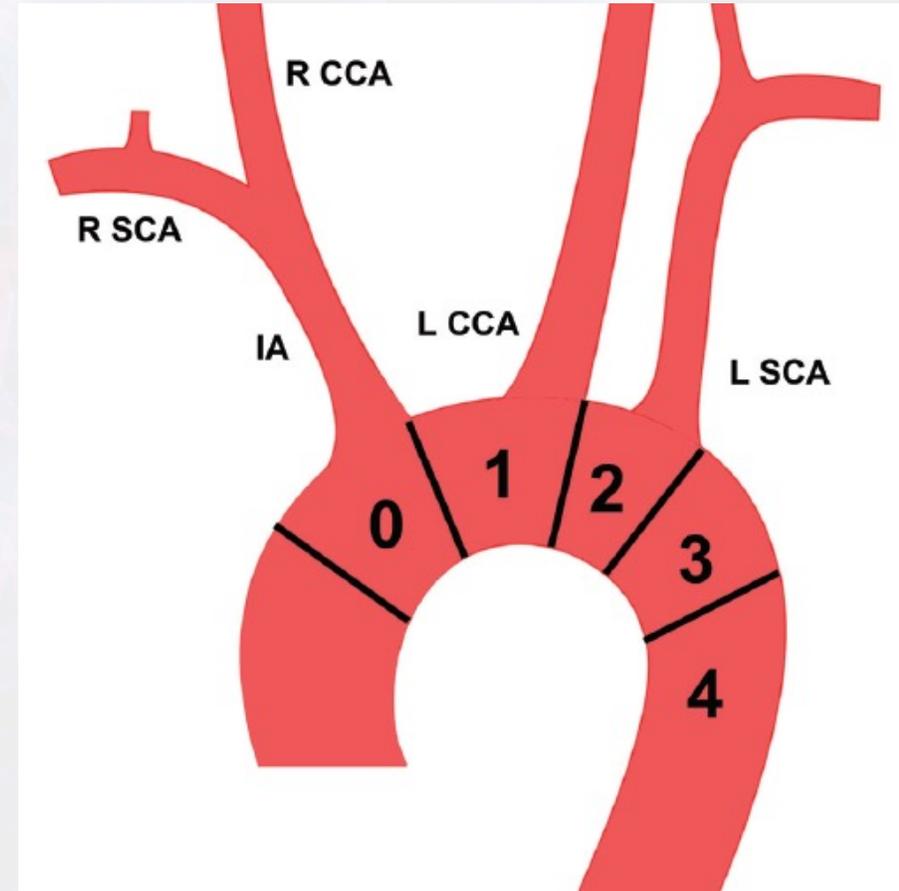
Sternotomie

Sous Circulation Extra-Corporelle (CEC) ± Arrêt circulatoire

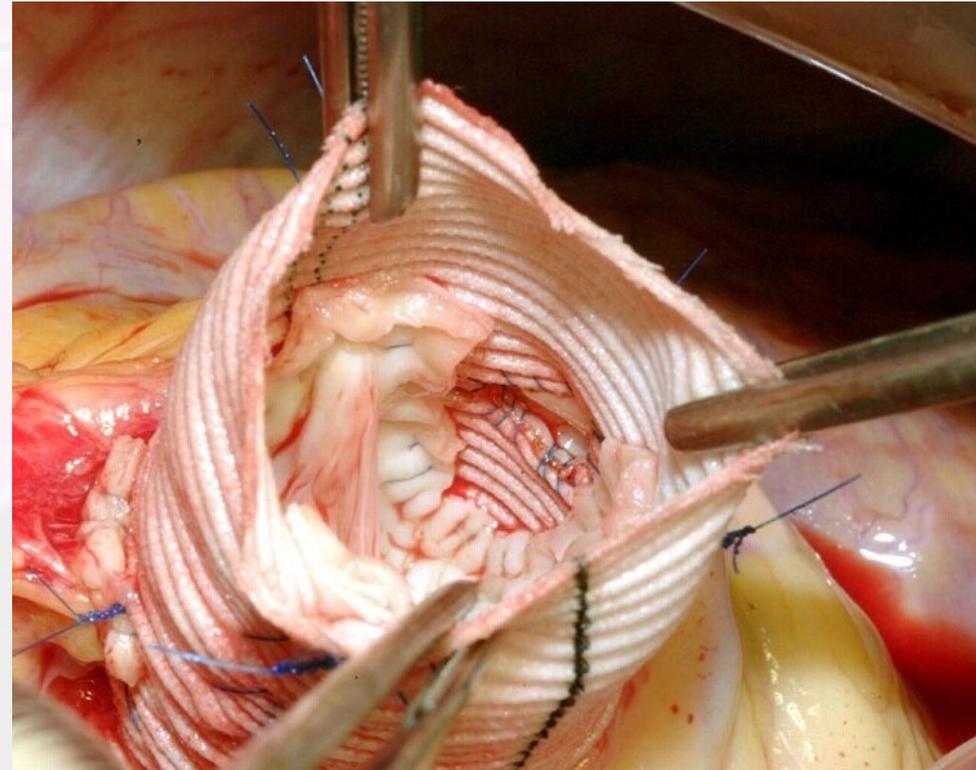
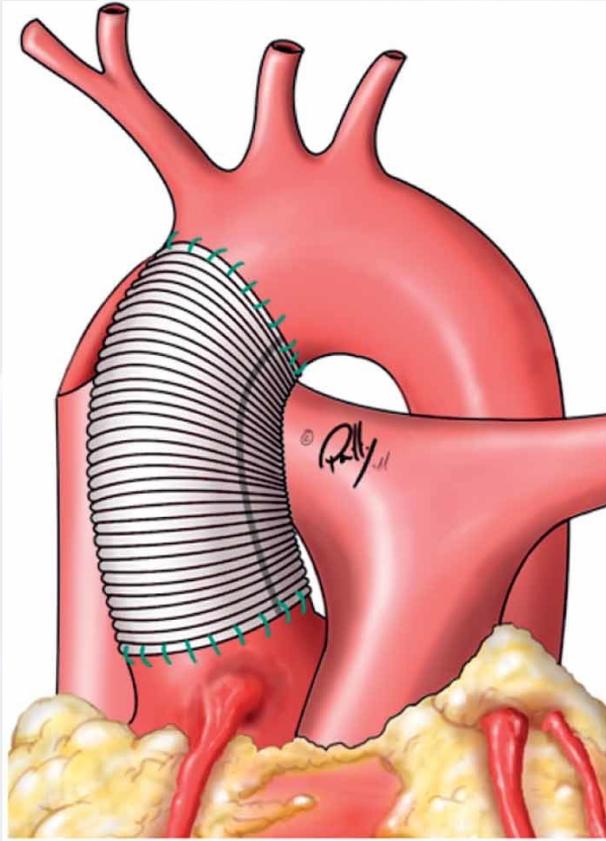
Reconstruction des parties lésées

- Culot et Valve : Yacoub/David, Bentall
- Aorte Ascendante : Tube sus coronaire
- Crosse aortique : hémi crosse, crosse complète, THORAFLEX
- ± Pontage coronaire

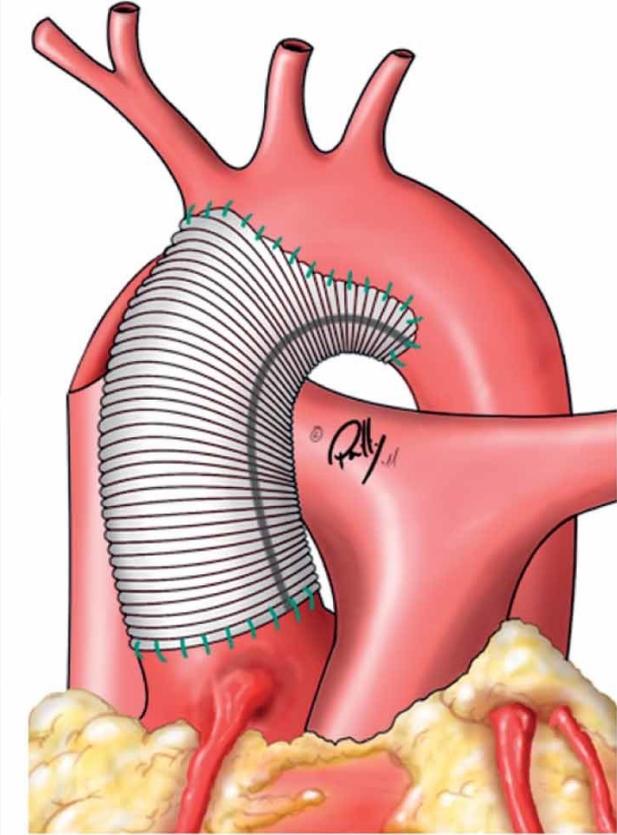
Guidée par : TDM pré opératoire, ETO per opératoire, constat per op, habitudes chirurgicales, état du patient



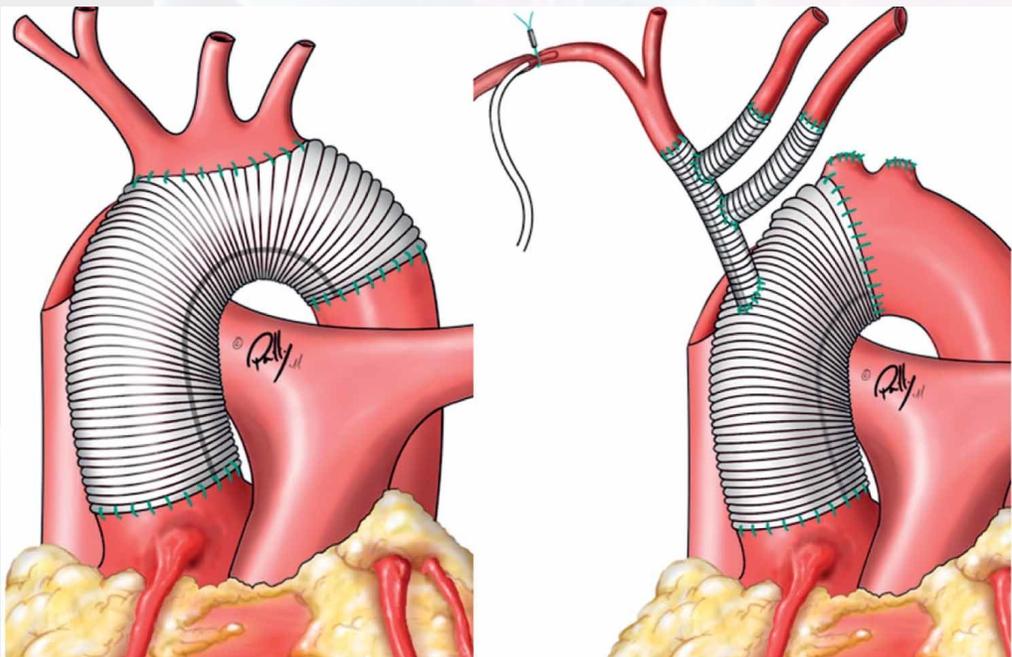
## DTA : Tube sus coronaire



## DTA : Hemi-crosse



# DTA : Crosse totale

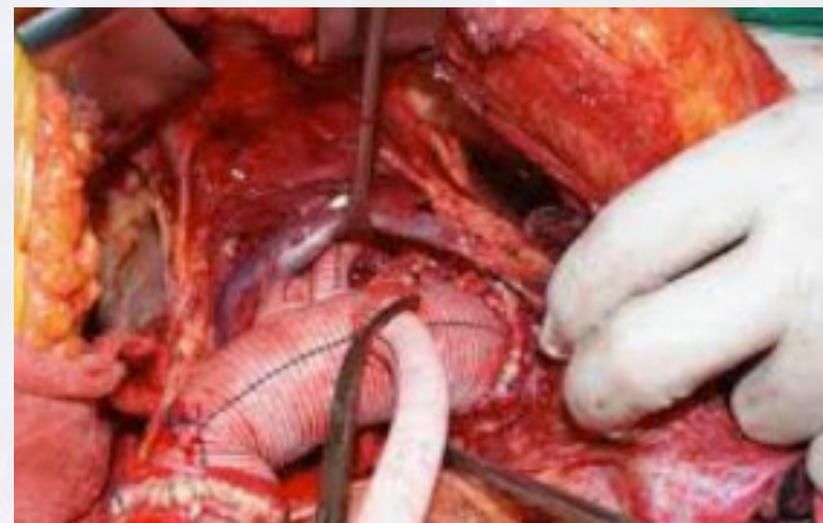


**c** Total arch replacement

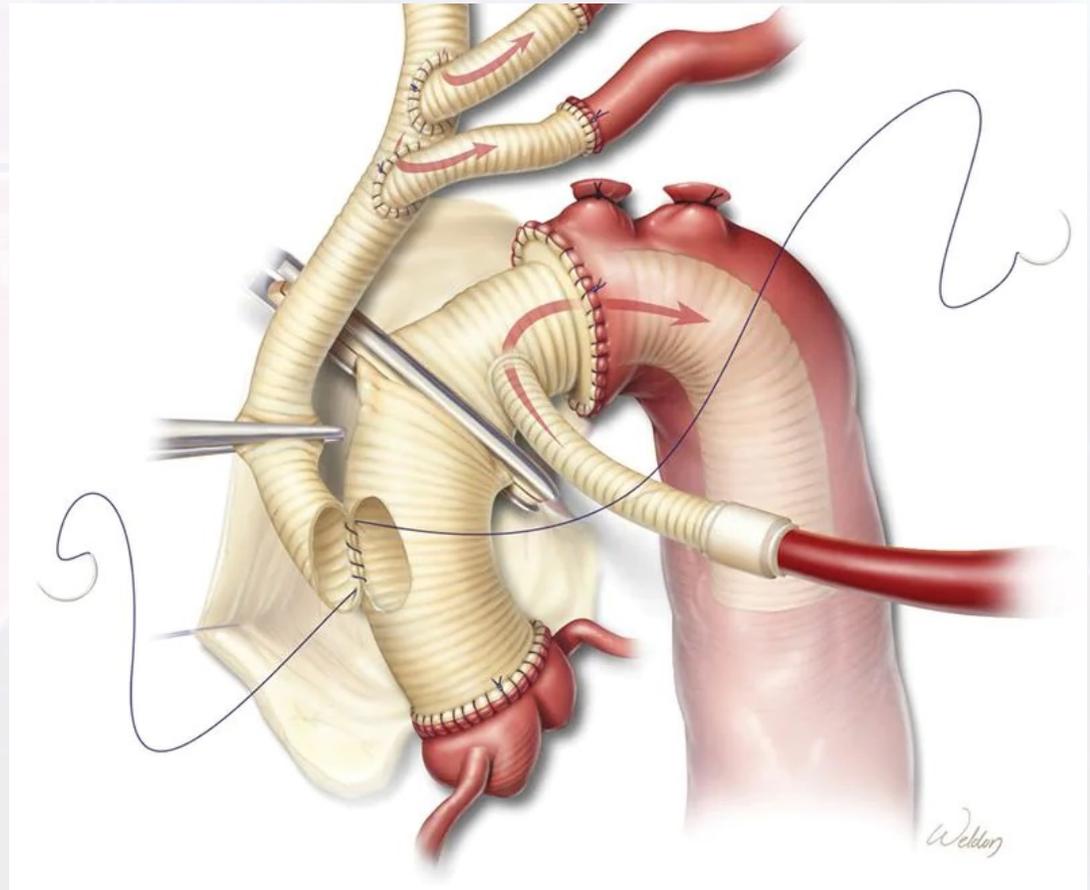
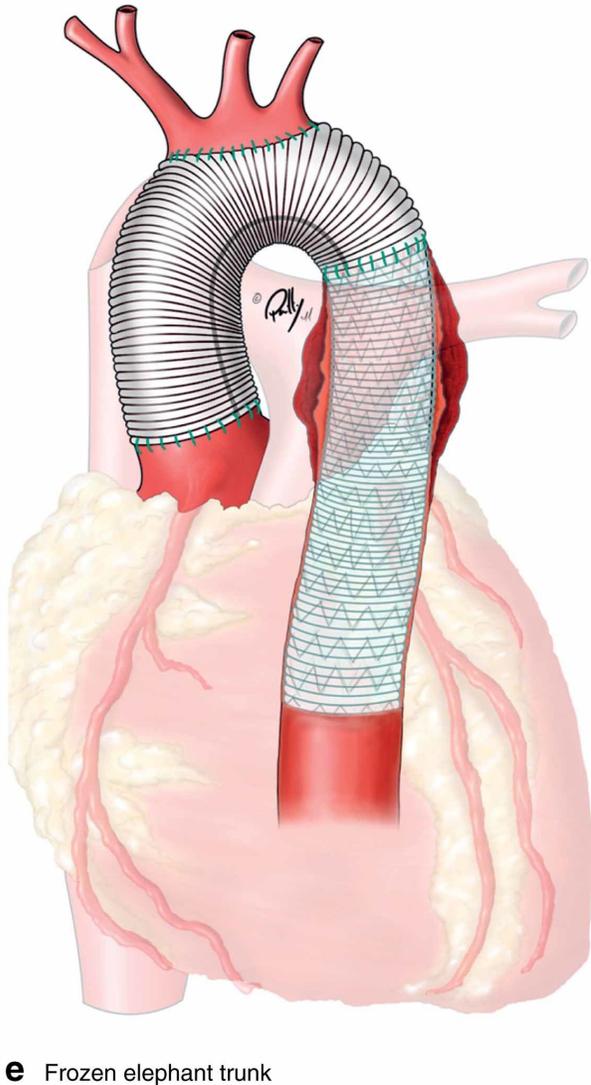
**d** Trifurcated graft



**B**

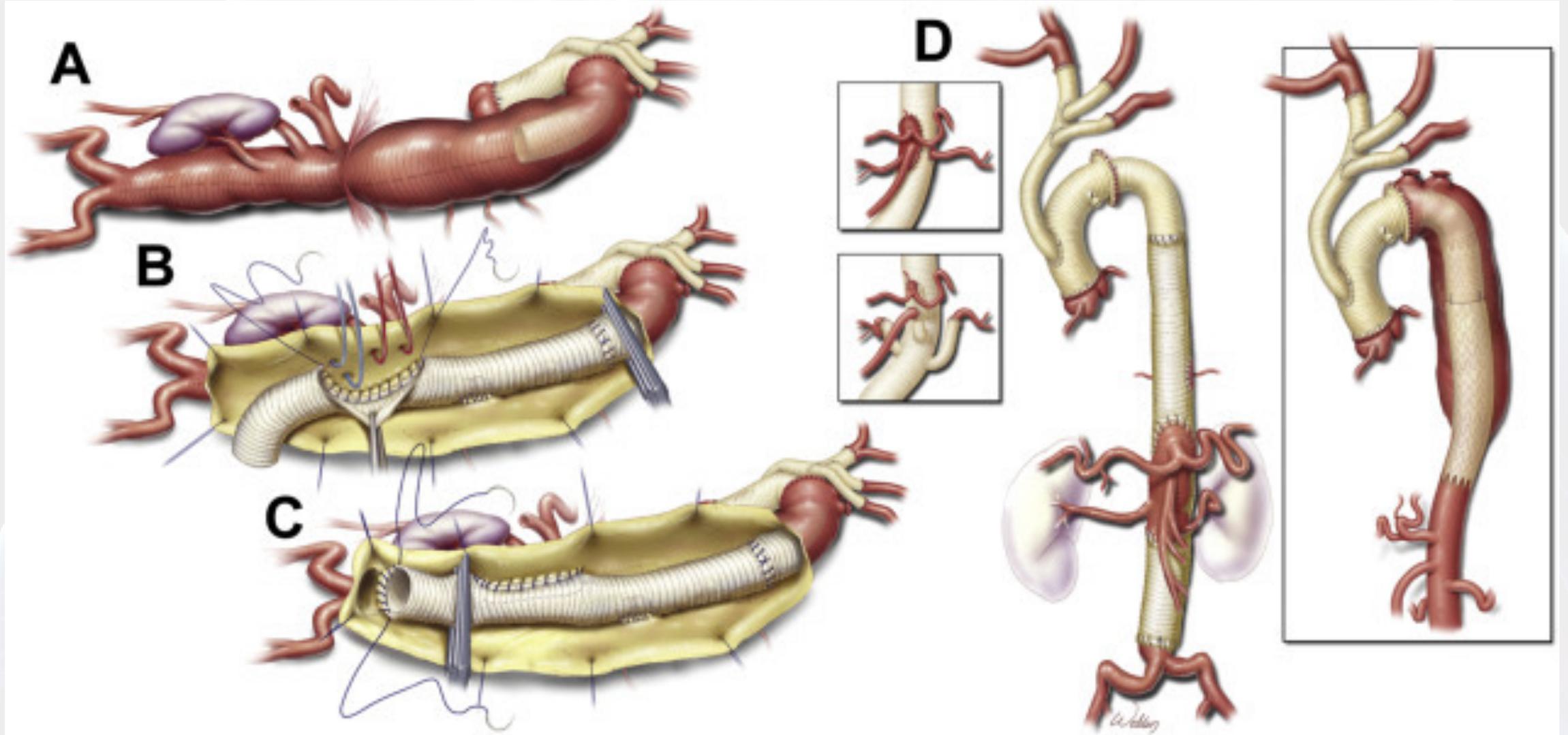


# DTA : Trompe d'éléphant

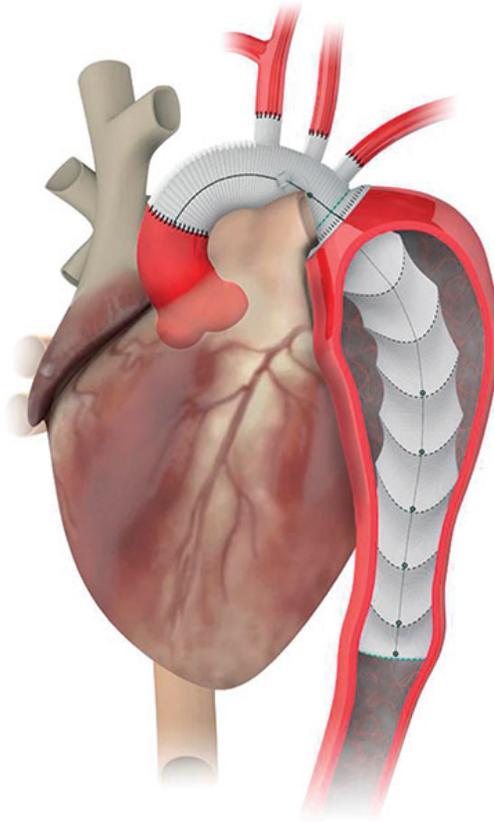
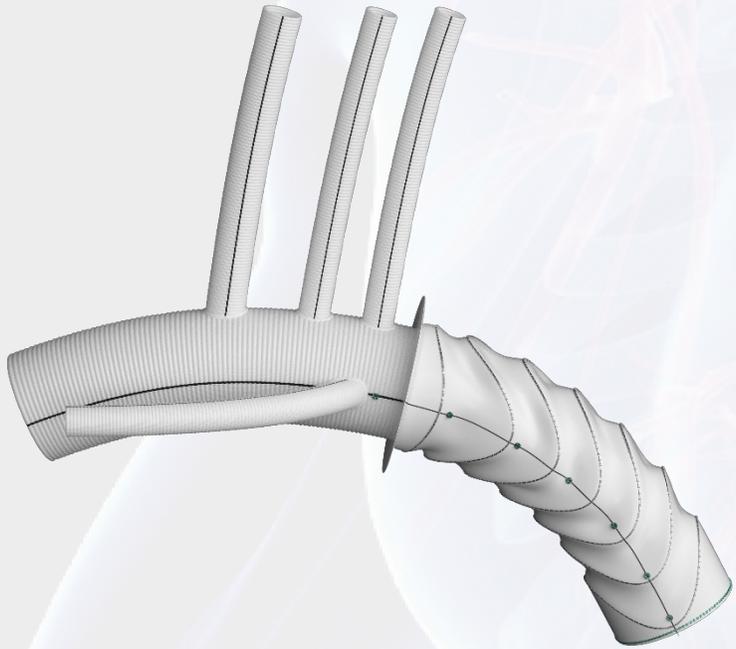


e Frozen elephant trunk

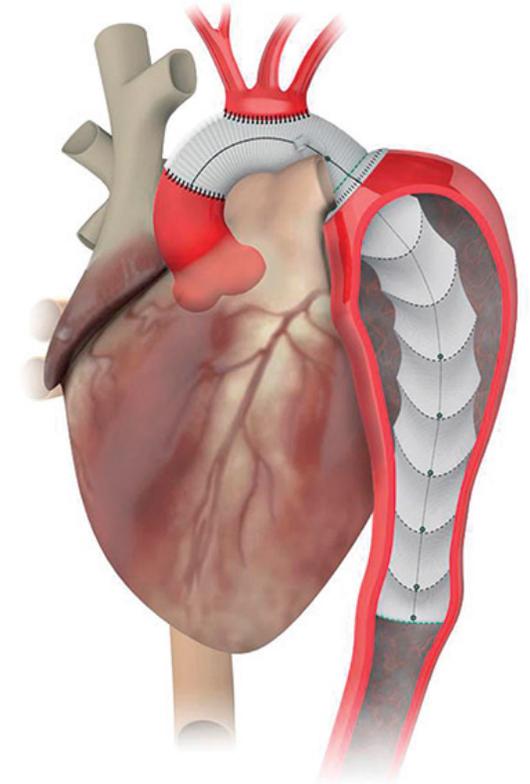
# DTA : Trompe d'éléphant



## DTA : Thoraflex

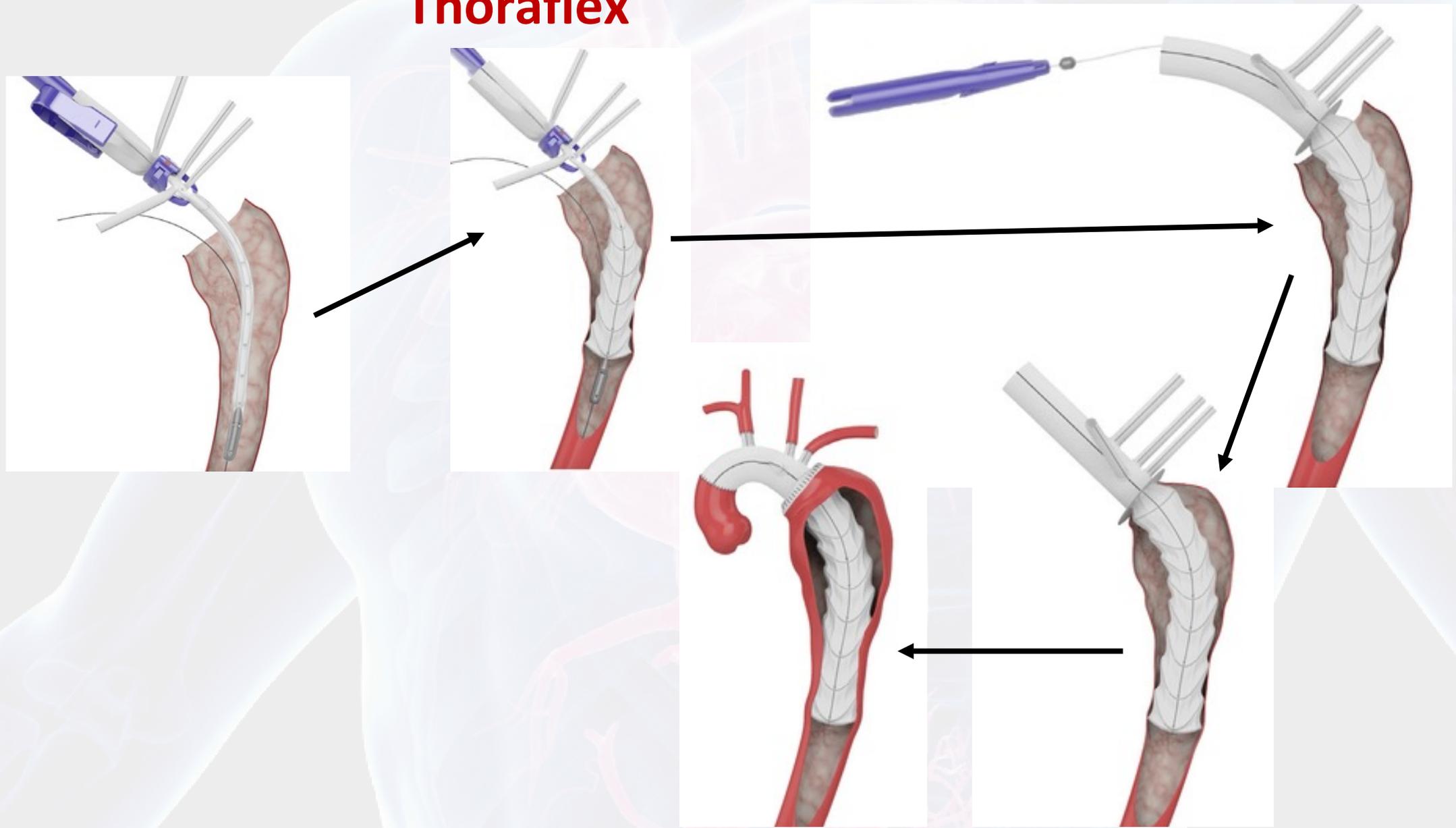


Thoraflex Hybrid Plexus



Thoraflex Hybrid Ante-Flo

# Thoraflex



# DTA : E-vita Open Neo

**A**

Zone 2-3

*En bloc (island) technique*



**B**

Zone 1-2-3

*Single vessel anastomosis*



**C**

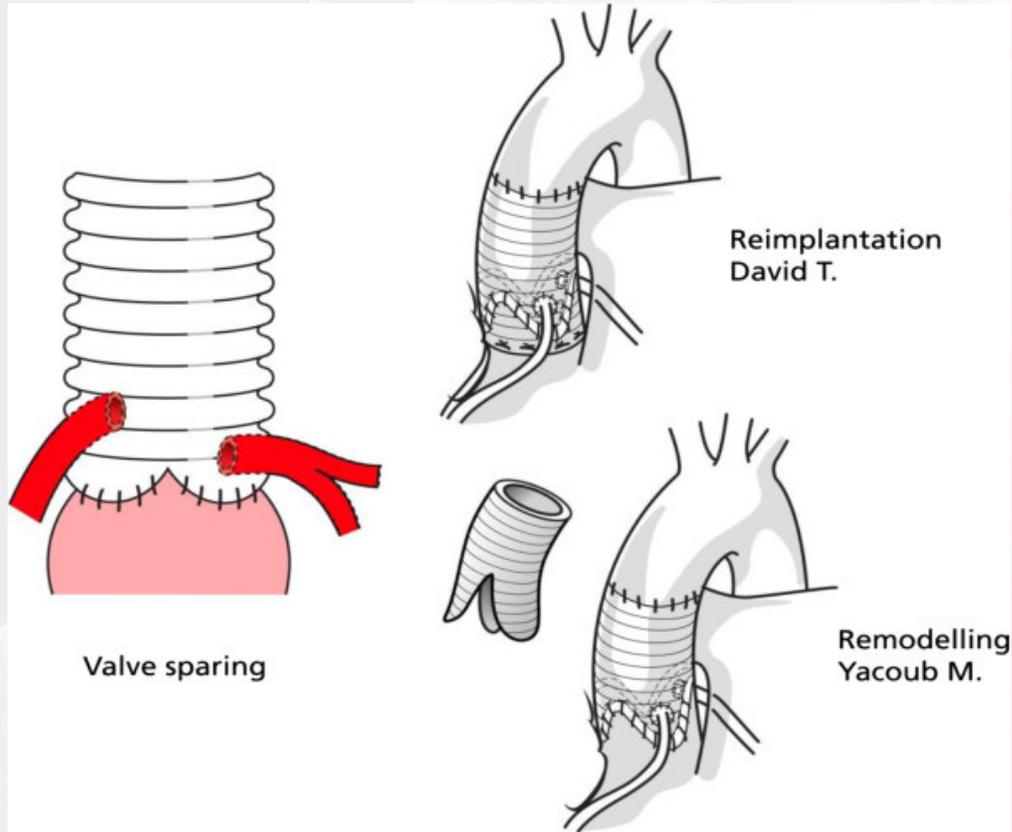
Zone 0-1

*Single vessel anastomosis*

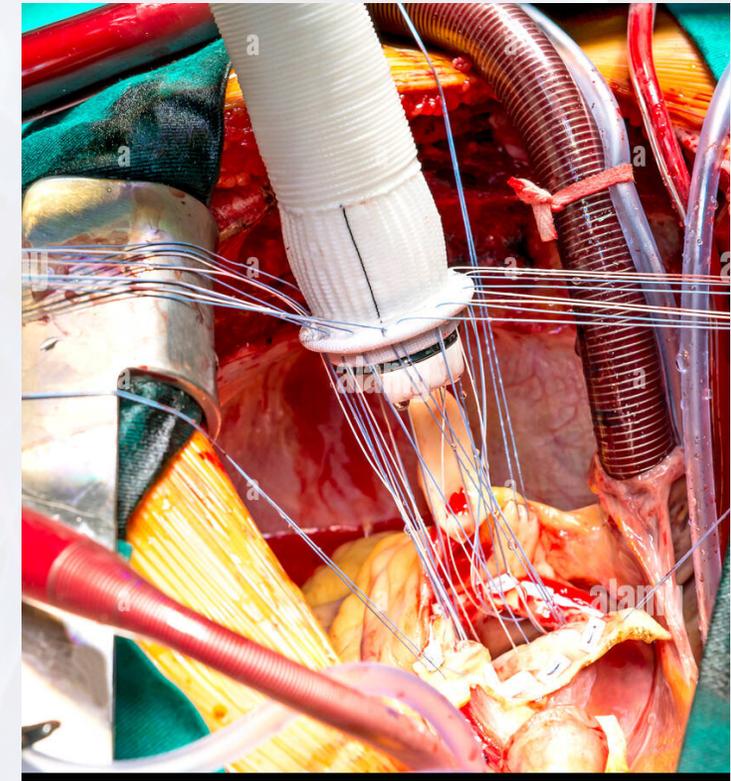
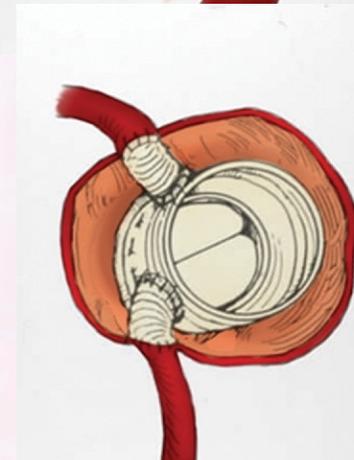
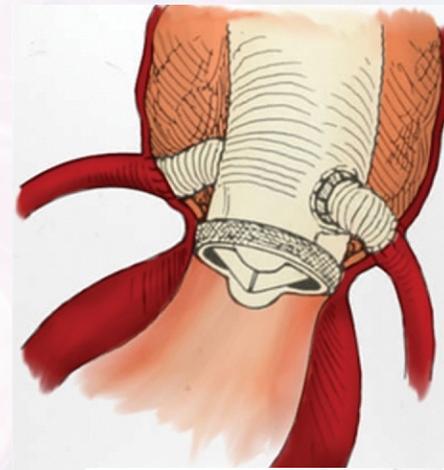


# DTA : Prise en charge de la racine et de la valve

Traitement conservateur :  
Yacoub ou David



Bentall : Remplacement valvulaire



# DTA : Particularités des IMH

Chirurgie

Traitement médical possible si DTA non compliquée + risque opératoire élevé + absence de facteurs de risque de gravité

1	B-NR
2b	C-LD

2. In patients with uncomplicated acute type A IMH, prompt open surgical repair is recommended.<sup>1,4-6</sup>

In selected patients with uncomplicated acute type A IMH who are at increased operative risk and do not have high-risk imaging features (Table 30), an initial or expectant approach of medical management may be considered.<sup>6-12</sup>

**TABLE 30** High-Risk Imaging Features of IMH

### For Type A IMH

- Maximum aortic diameter >45-50 mm<sup>18,20</sup>
- Hematoma thickness  $\geq 10$  mm<sup>4</sup>
- Focal intimal disruption with ulcer-like projection involving ascending aorta or arch<sup>18,21</sup>
- Pericardial effusion on admission<sup>18</sup>

### For Both Type A and Type B IMH

- Progression to aortic dissection<sup>19</sup>
- Increasing aortic diameter<sup>21,22</sup>
- Increasing hematoma thickness<sup>21,22</sup>

IMH indicates intramural hematoma.

# DTA : Particularités PAU Asymptomatique

Traitement médical acceptable si asymptomatique sans facteur de risque évolutif à l'imagerie

2b

C-LD

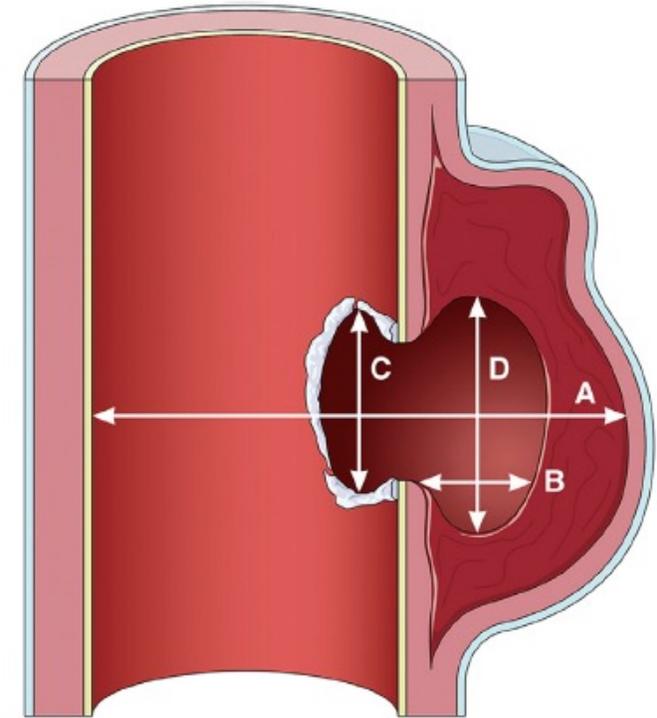
2. In patients with isolated PAU who are asymptomatic but have high-risk imaging features (Table 31), elective repair may be considered.<sup>1,2,4</sup>

**TABLE 31** High-Risk Imaging Features of PAUs

## Feature

- Maximum PAU diameter  $\geq 13$ -20 mm<sup>1</sup>
- Maximum PAU depth  $\geq 10$  mm<sup>1</sup>
- Significant growth of PAU diameter or depth
- PAU associated with a saccular aneurysm<sup>5</sup>
- PAU with an increasing pleural effusion<sup>1</sup>

PAU indicates penetrating atherosclerotic ulcer.



(A) Maximal aortic diameter at ulcer site diameter (from ulcer across to opposite aortic wall). (B) Depth of intramural blood pool. (C) Length of intimal defect at ulcer site. (D) Width of intramural blood pool. Adapted from Gifford et al,<sup>11</sup> Copyright 2016, with permission from Elsevier, Inc., and from Cho et al<sup>9</sup> Copyright 2004 with permission from the Society for Vascular Surgery.

# DTB : Principe de Prise en charge

- Traitement médical en 1<sup>ère</sup> intention
- Indication chirurgicale :
  - **DTB compliquée** : indication formelle
  - Possible pour DTB **non compliquée avec facteurs de risque de gravité radiologiques ou cliniques**
- Endovasculaire en 1<sup>ère</sup> intention
- Prise en charge par les **chirurgiens vasculaires**

COR	LOE	RECOMMENDATIONS
1	B-NR	1. In all patients with uncomplicated acute type B aortic dissection, medical therapy is recommended as the initial management strategy. <sup>1-3</sup>
1	C-LD	2. In patients with acute type B aortic dissection and rupture or other complications (Table 27), intervention is recommended. <sup>4-6</sup>
1	C-EO	In patients with rupture, in the presence of suitable anatomy, endovascular stent grafting, rather than open surgical repair, is recommended.
2a	C-LD	In patients with other complications, in the presence of suitable anatomy, the use of endovascular approaches, rather than open surgical repair, is reasonable. <sup>4-6,7</sup>
2b	B-R	3. In patients with uncomplicated acute type B aortic dissection who have high-risk anatomic features (Table 28), endovascular management may be considered. <sup>8,9</sup>

# DTB : Principe de Prise en charge

## Dissection de Type B compliquée

**TABLE 27** Consensus Features of Complicated Acute Type B Aortic Dissection

Feature	Comment
Aortic rupture <sup>1</sup>	This can be either free or contained (including hemothorax, increasing periaortic hematoma, or both; or mediastinal hematoma) and should be addressed promptly.
Branch artery occlusion and malperfusion <sup>2</sup>	Complete or partial occlusion of a major branch, with or without clinical evidence of ischemia; this includes visceral, renal, and peripheral arterial branches.
Extension of dissection <sup>3</sup>	Extension of the dissection flap either distally or proximally (ie, retrograde type A dissection)
Aortic enlargement	Progressive enlargement of the true, false, or both lumens while in the acute phase may require prompt intervention.
Intractable pain <sup>15</sup>	
Uncontrolled hypertension <sup>15</sup>	

# DTB : Principe de Prise en charge

## Dissection de Type B non compliquée à haut risque évolutif

**TABLE 28** High-Risk Features in Uncomplicated Acute Type B Aortic Dissection<sup>9</sup>

### High-Risk Imaging Findings

Maximal aortic diameter >40 mm

False-lumen diameter >20-22 mm

Entry tear >10 mm

Entry tear on lesser curvature

Increase in total aortic diameter of >5 mm between serial imaging studies

Bloody pleural effusion

Imaging-only evidence of malperfusion

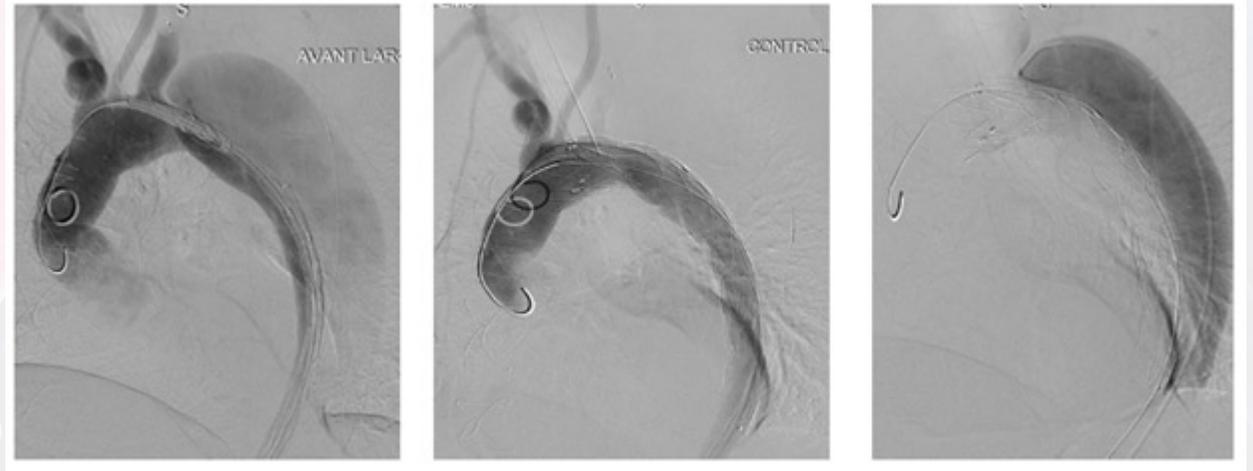
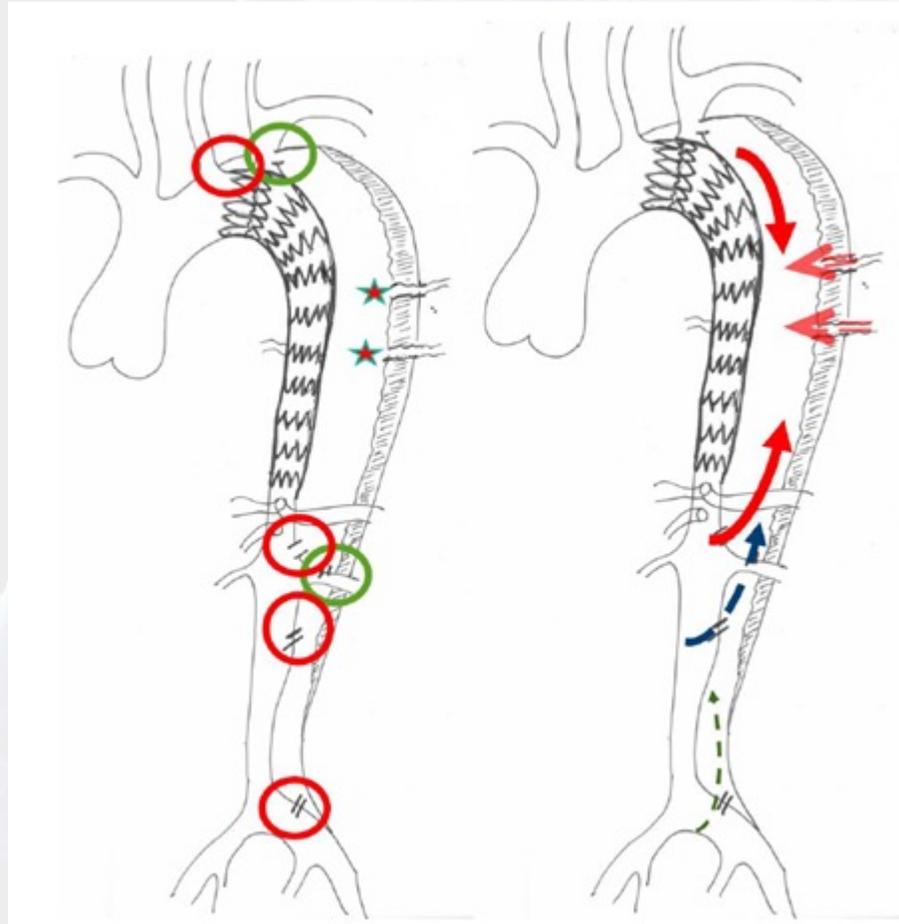
### High-Risk Clinical Findings

Refractory hypertension despite >3 different classes of antihypertensive medications at maximal recommended or tolerated doses

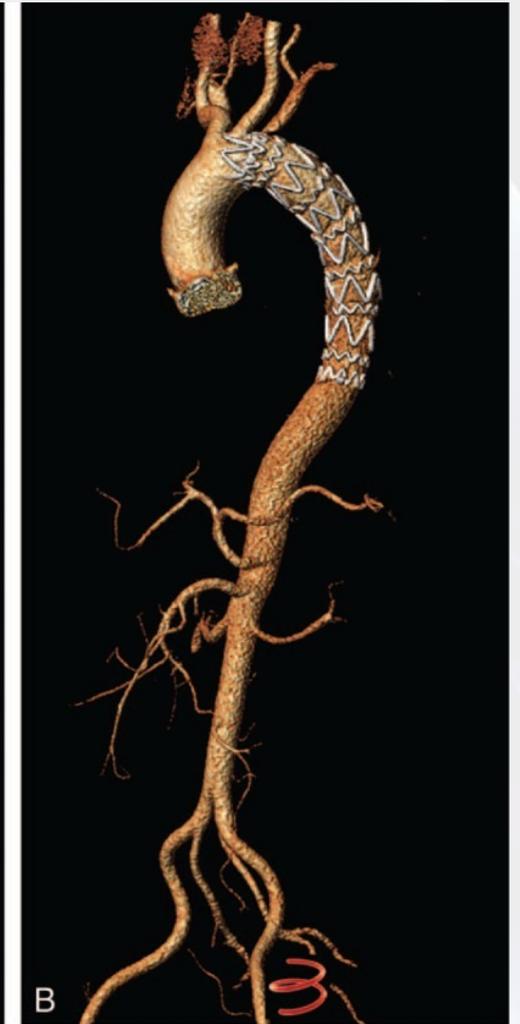
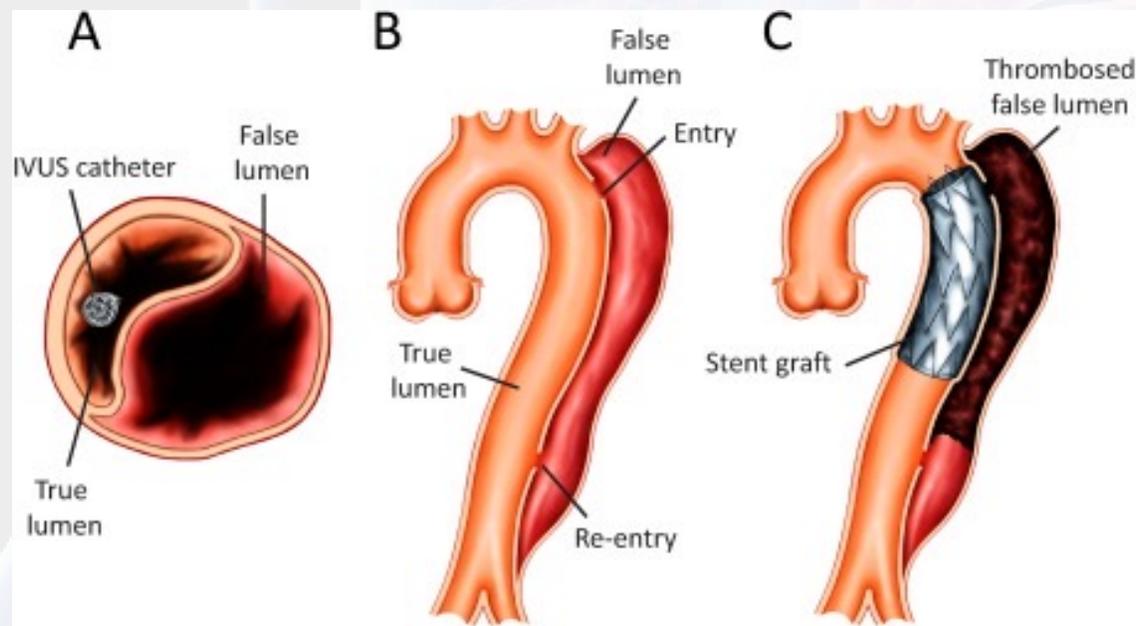
Refractory pain persisting >12 h despite maximal recommended or tolerated doses

Need for readmission

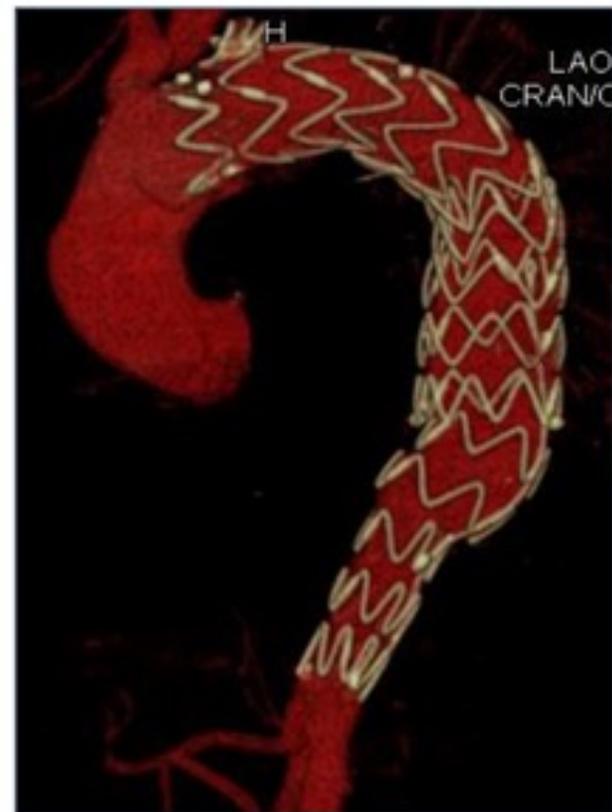
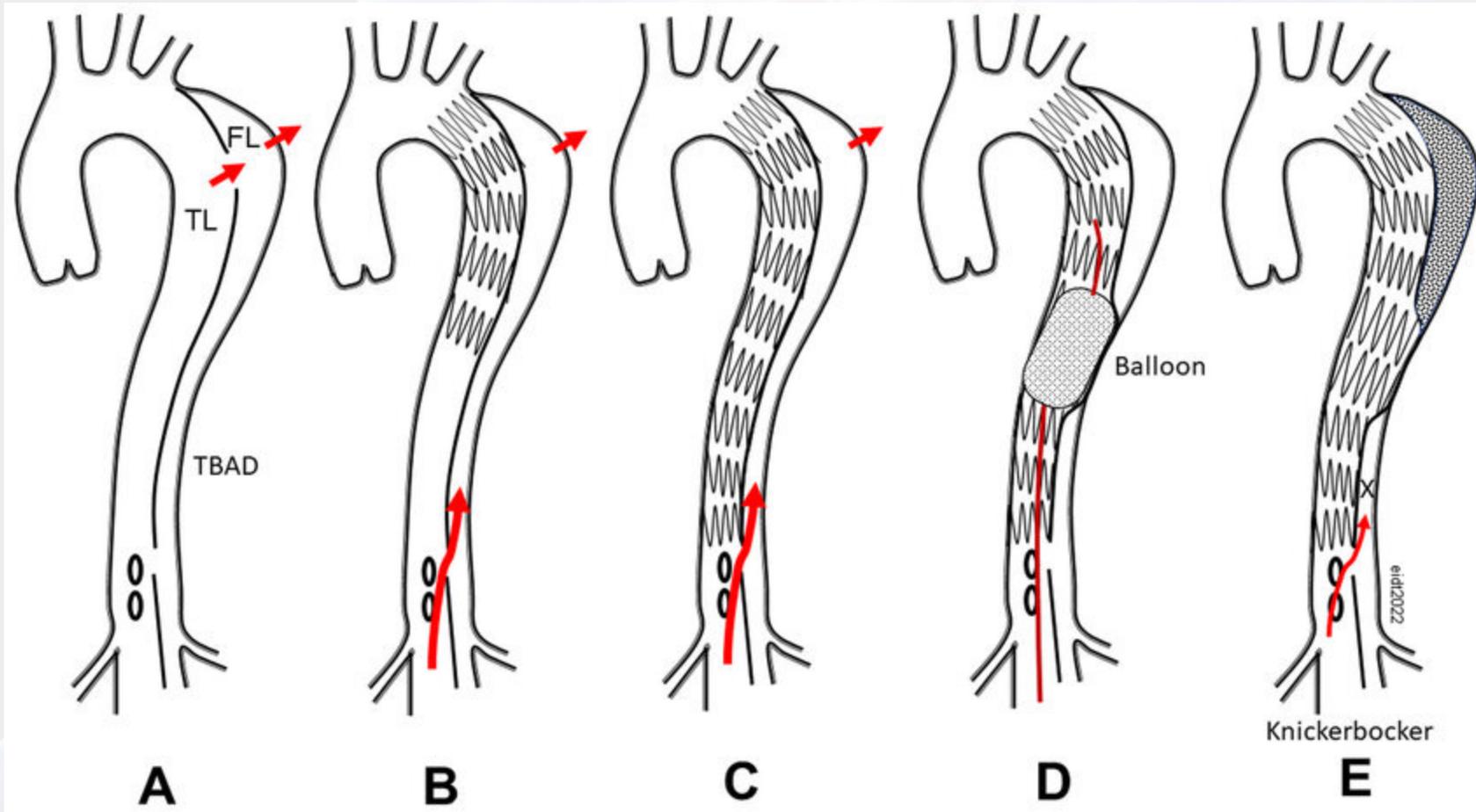
# Traitement Chirurgical des DTB : principes



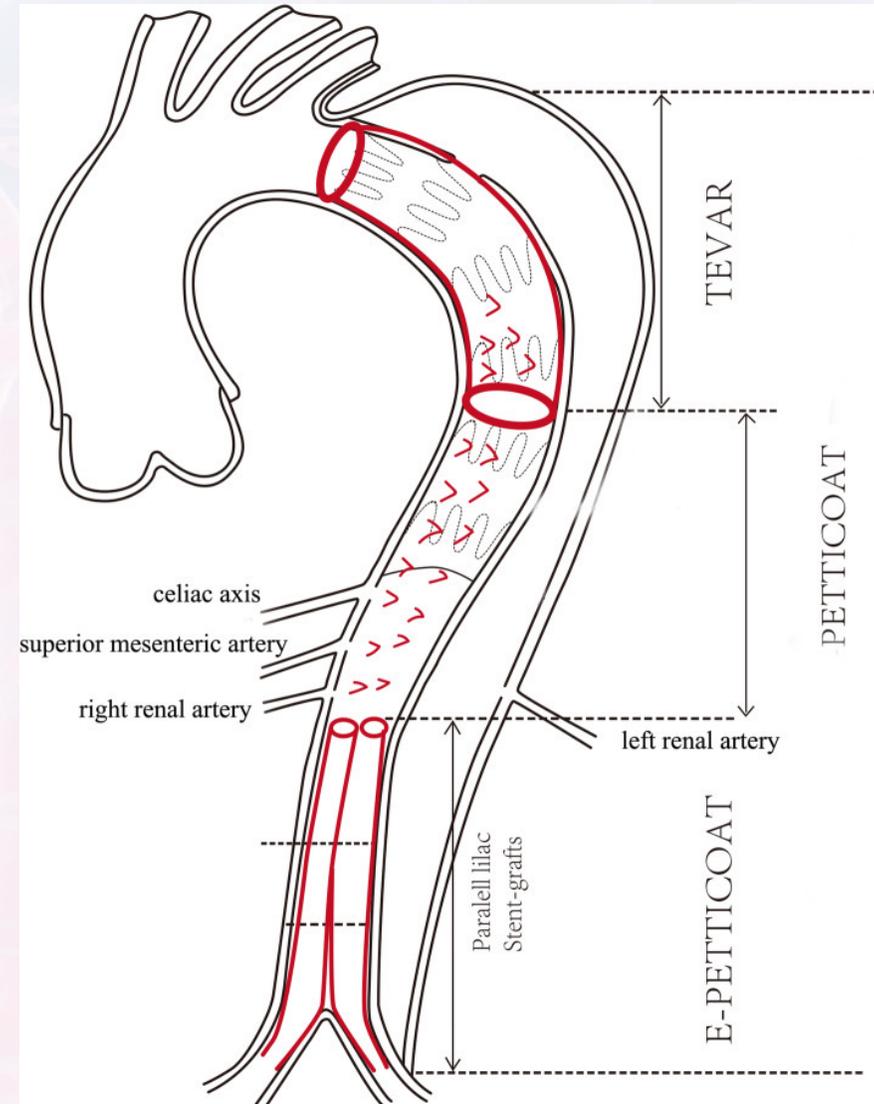
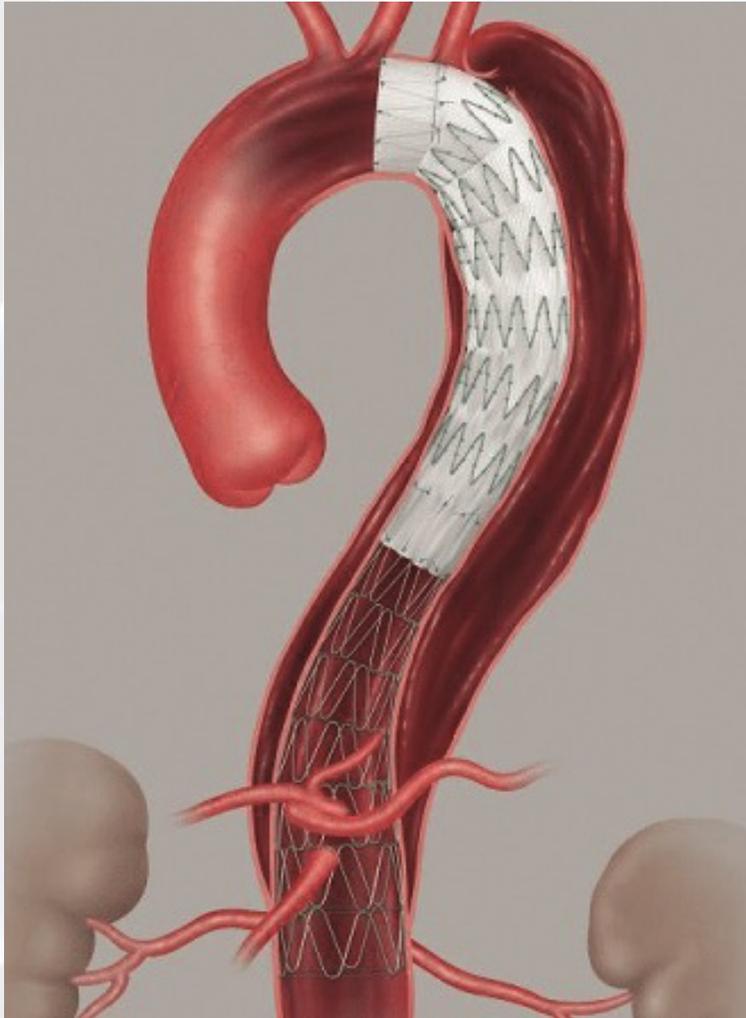
# DTB : TEVAR (Thoracic Endovascular Aortic Repair)



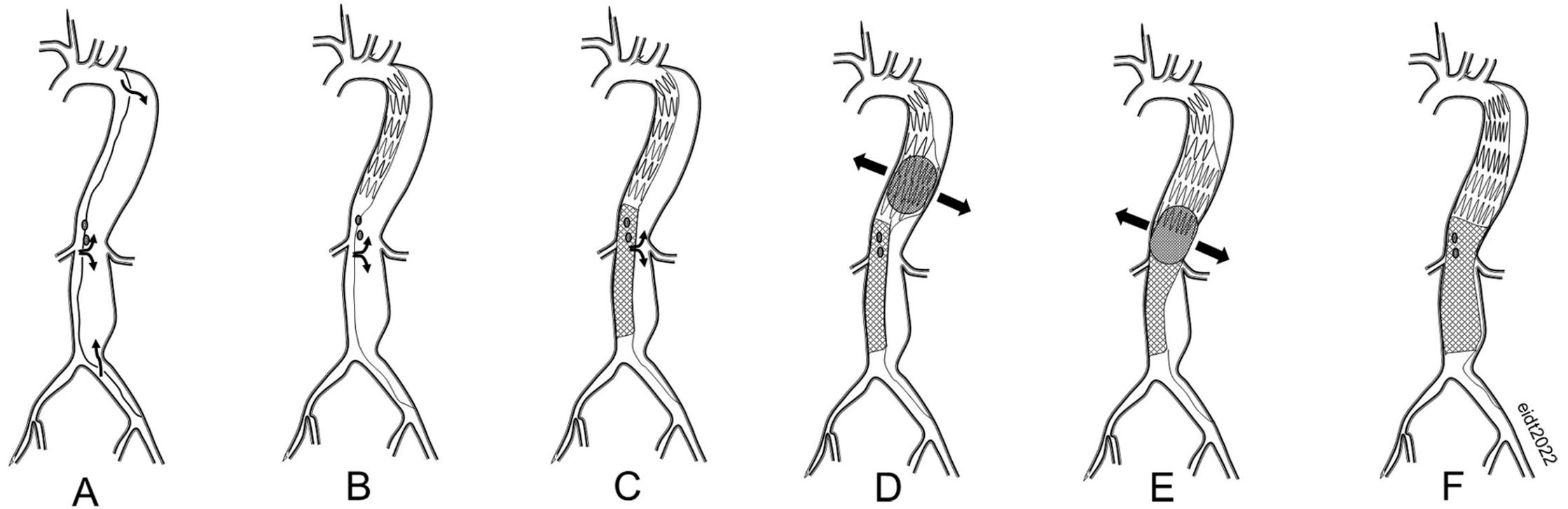
# DTB : Knickerbocker technique



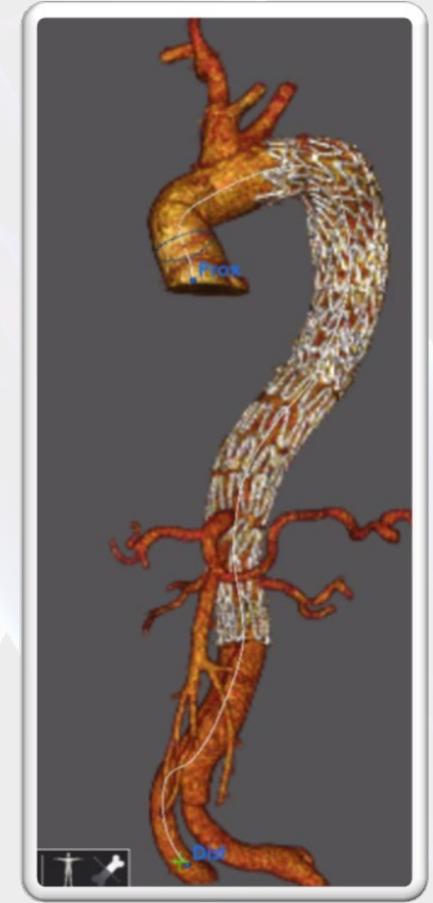
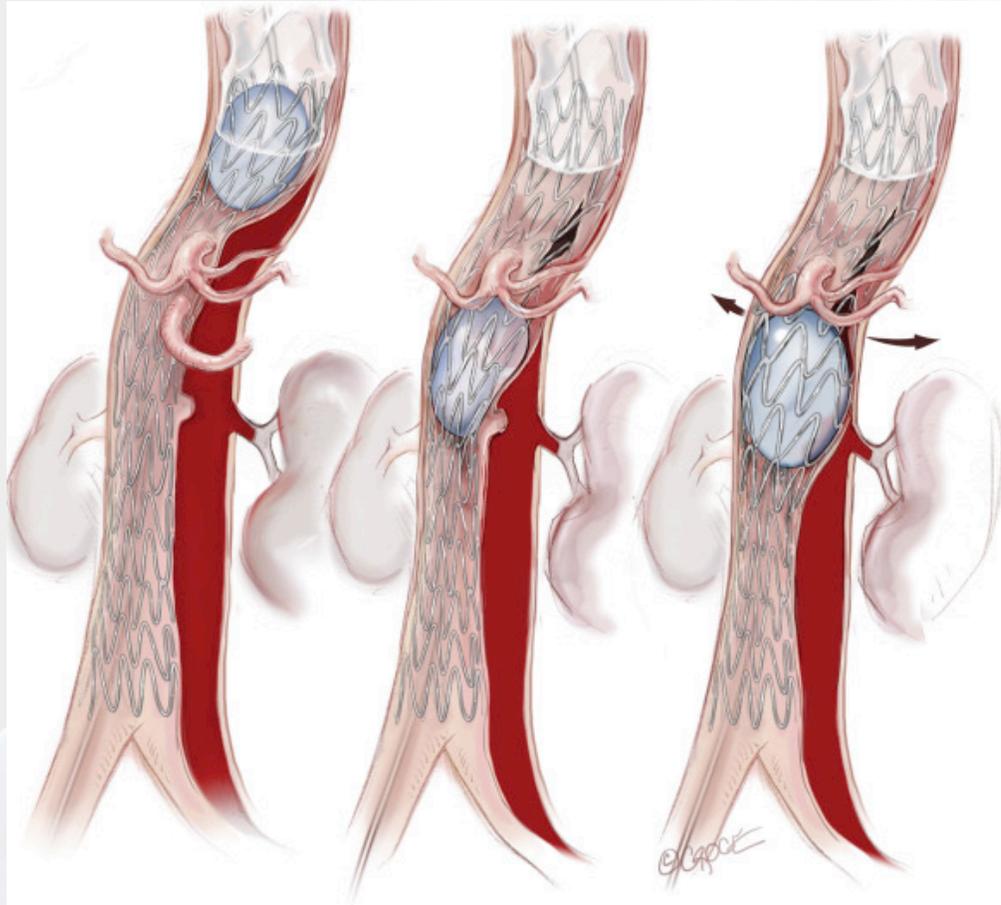
# DTB : PETTICOAT / STABLE et E- PETTICOAT



# DTB : STABILISE (1)



# DTB : STABILISE (2)



## DTB : STABILISE (3)

Homme de 63 ans avec rupture de l'ATD

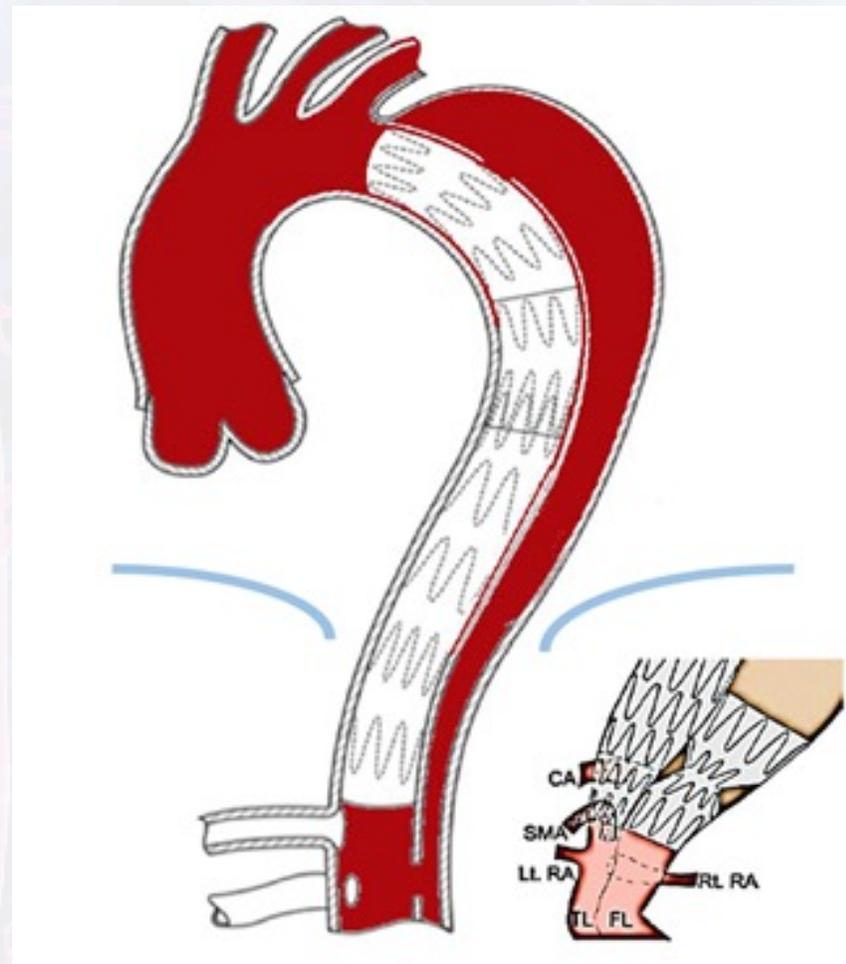
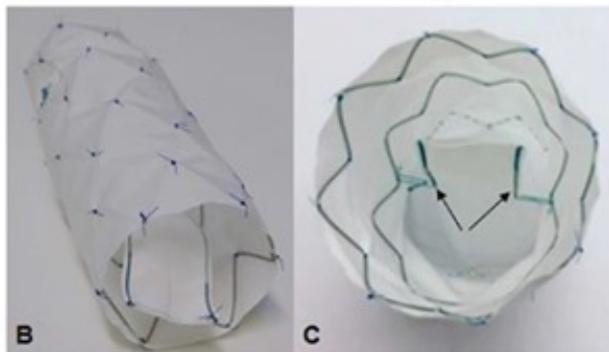
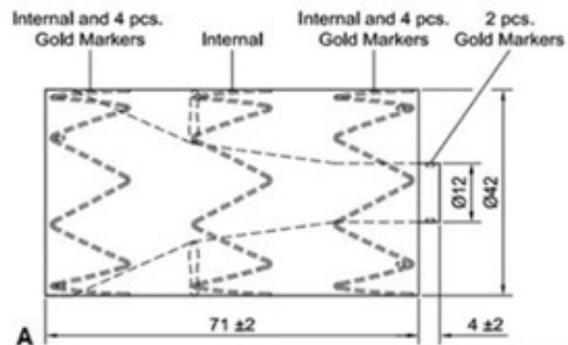
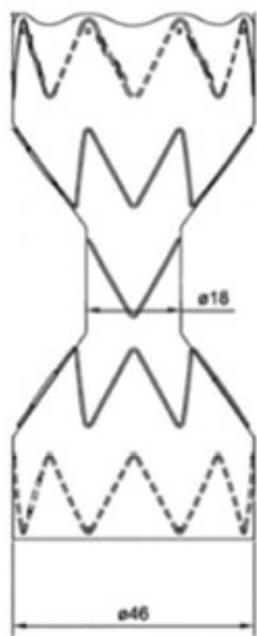


Résultat à 3 ans

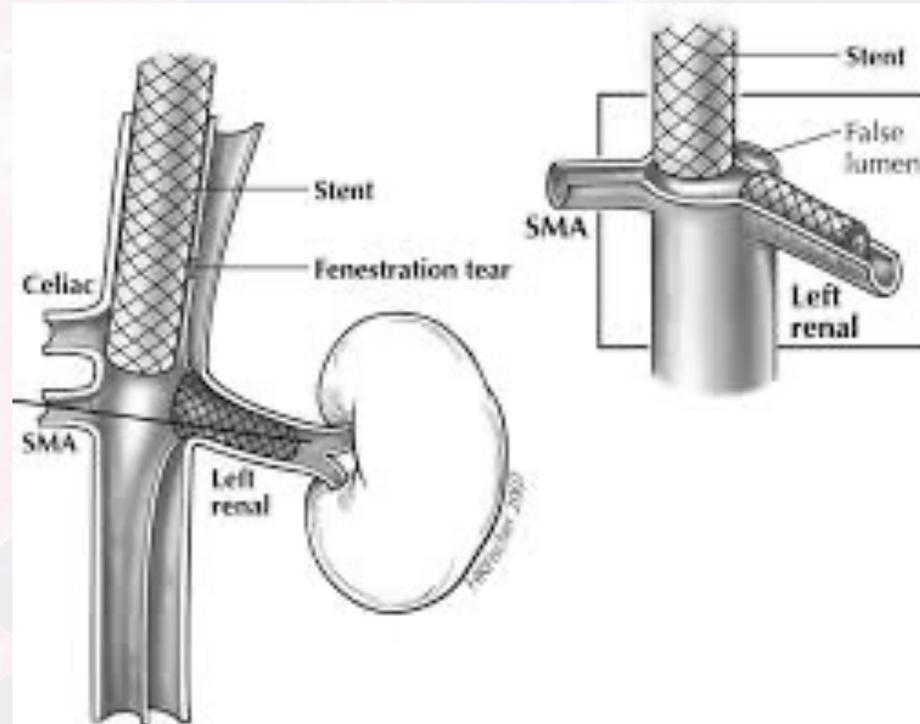
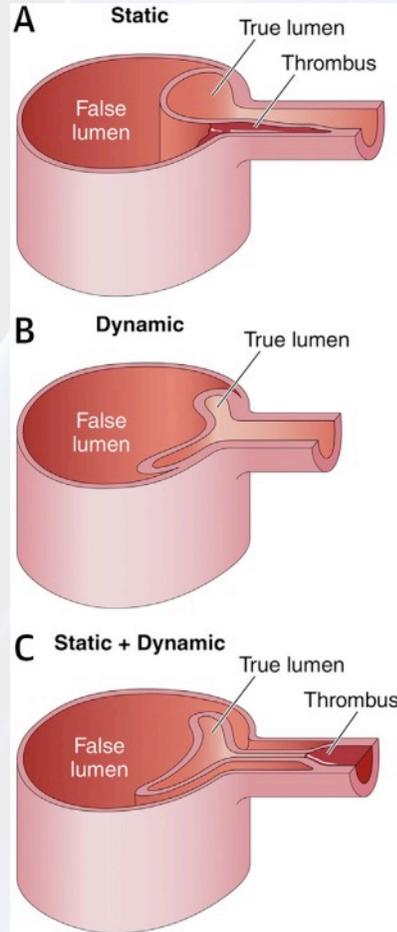


# DTB : Candy Plug

First generation Candy-Plug

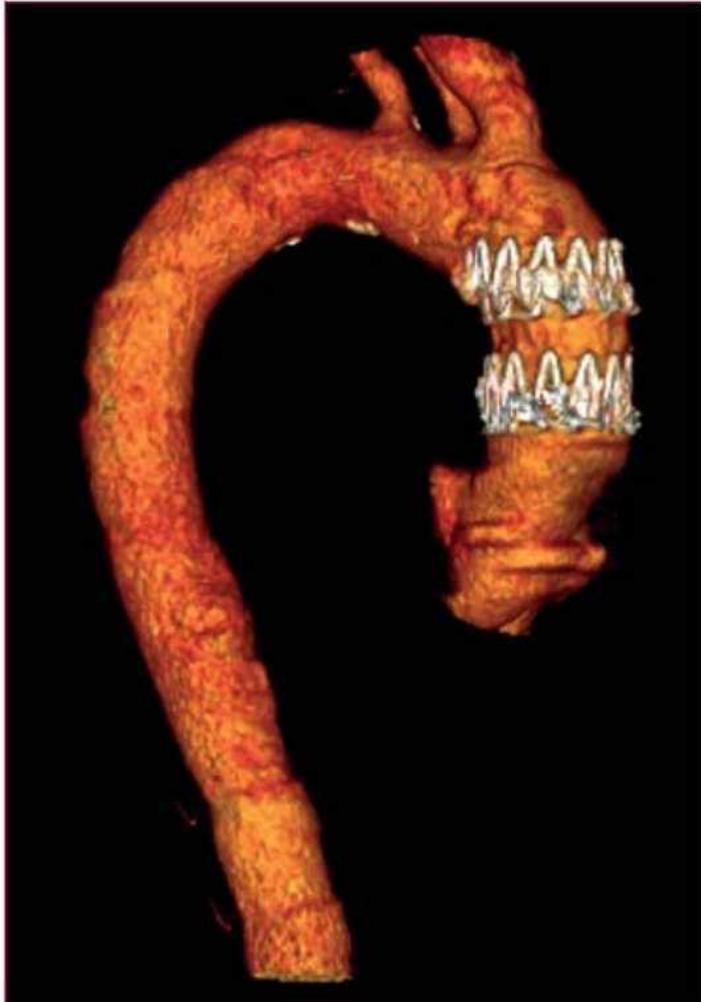


# PEC des malperfusions

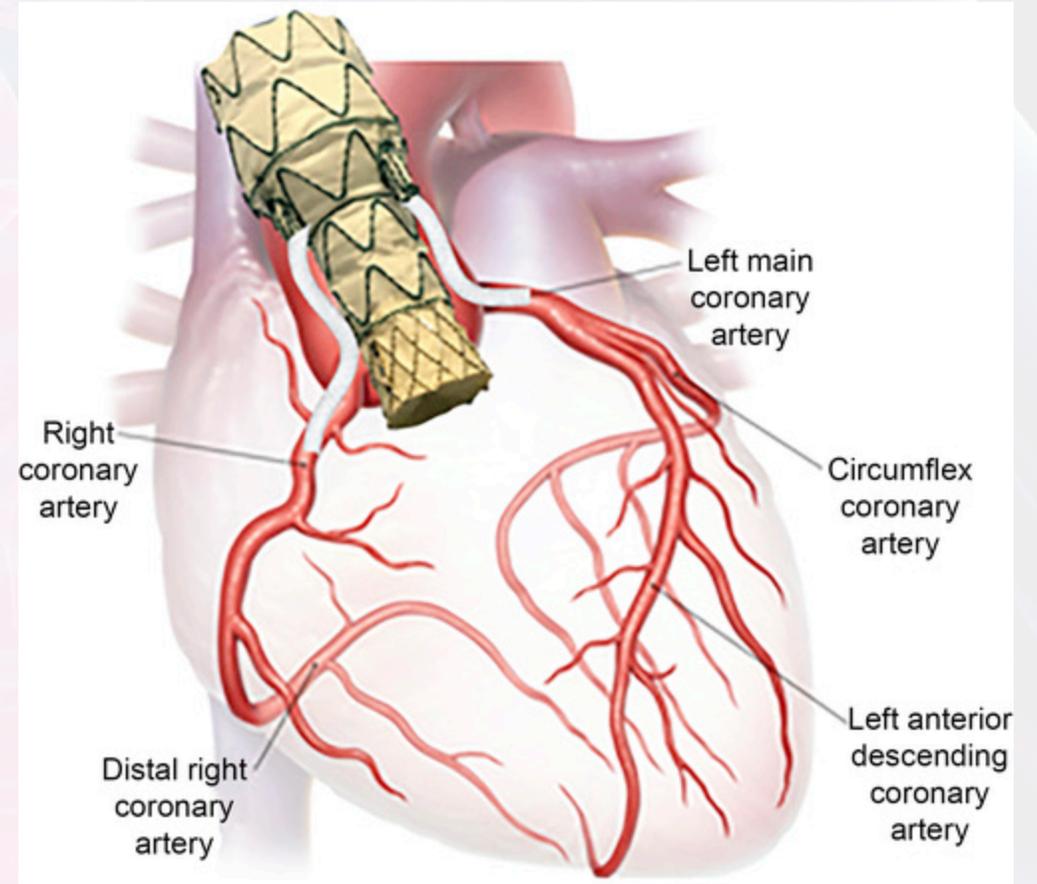


# Perspectives : DTA endovasculaire

TEVAR Ao Ascendante

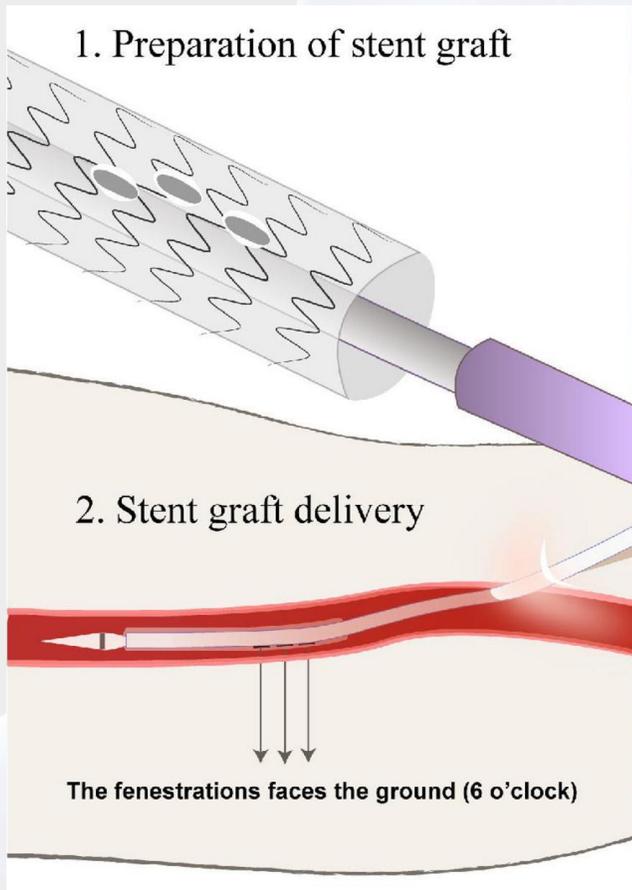


Endo- Bentall

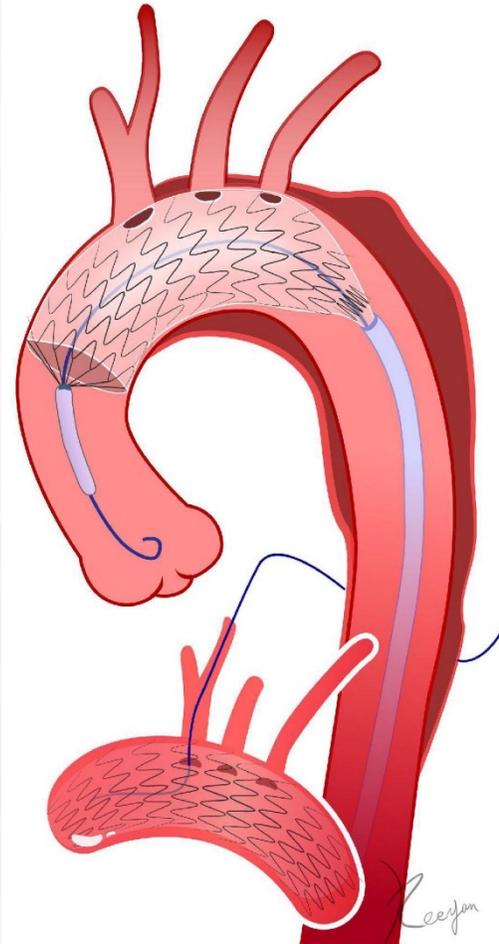


# Perspectives : DTA endovasculaire

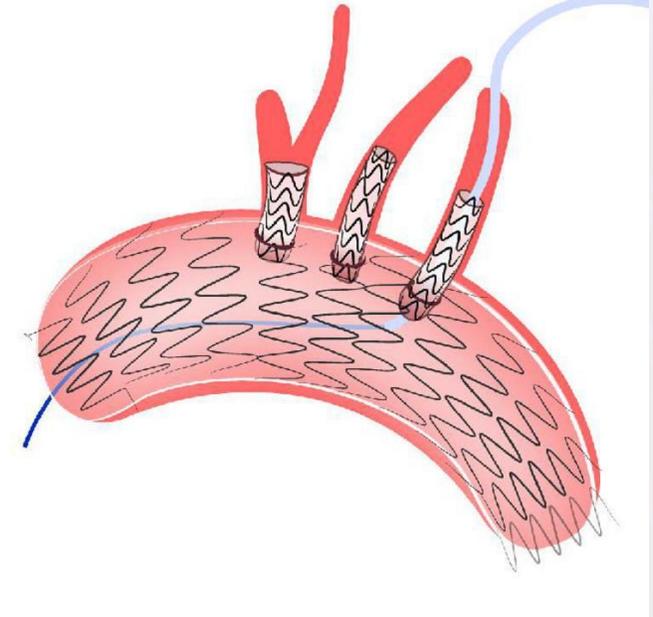
## Prothèse Home-Made de la crosse



3. Delivery and deployment of the stent graft by direction inversion strategy



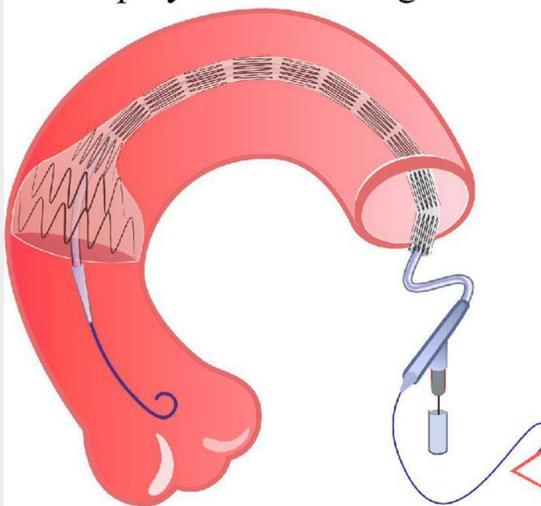
4. Stent deployment in the branches



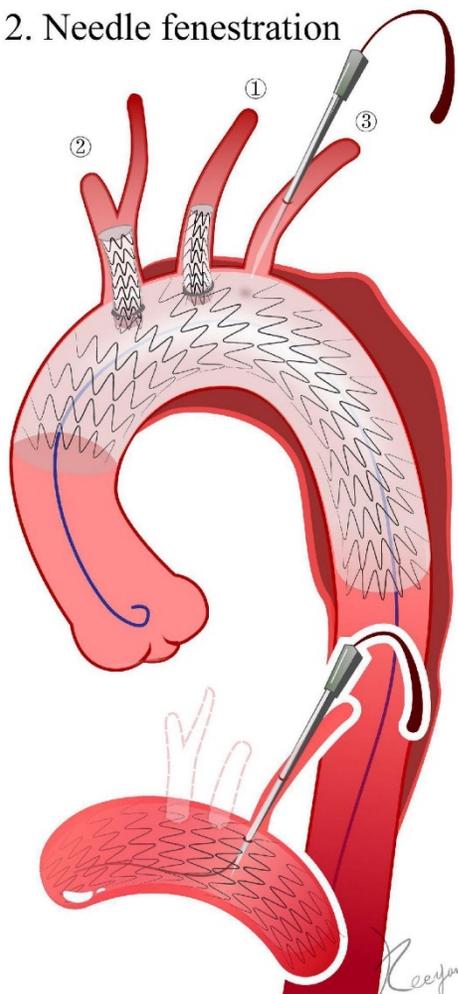
# Perspectives : DTA endovasculaire

## Fenestration d'une TEVAR

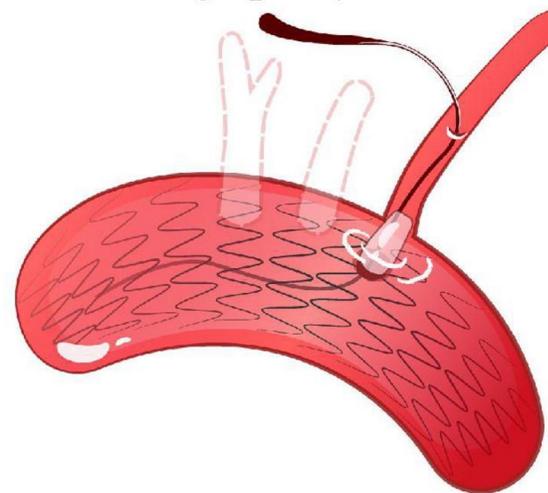
1. Deployment of stent graft



2. Needle fenestration



3. Balloon angioplasty



4. Deployment of stents in the branches

