

# TIPS & TRICKS FOR SIMPLIFYING F-BEVAR

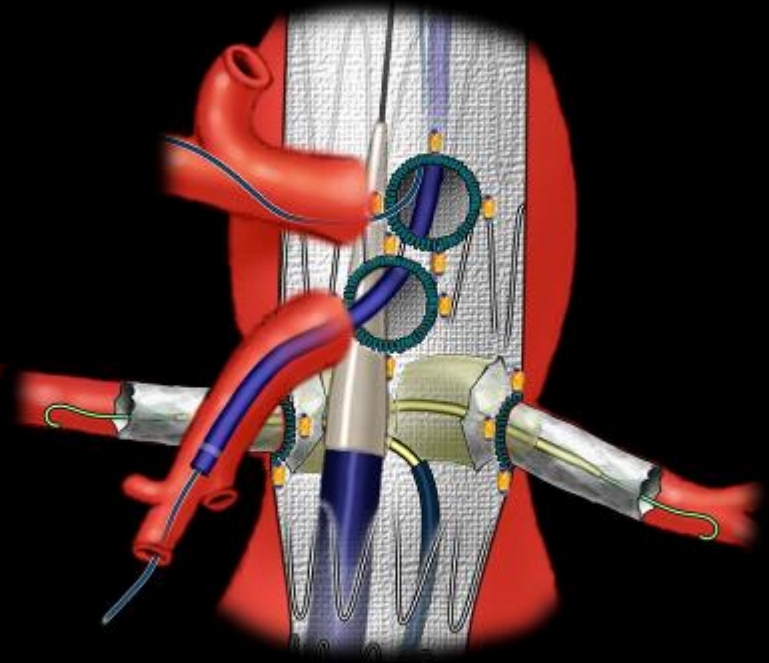
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Director of Endovascular Therapy

Professor of Surgery

Division of Vascular and Endovascular Surgery



**CRITICAL ISSUES**  
IN AORTIC ENDOGRAFTING 2016

# FACULTY DISCLOSURE

Gustavo S. Oderich MD

- Consulting, DSMB, CEC\*

*Cook Medical Inc., WL Gore, Lombardi*

- Research grants\*

*Cook Medical Inc., WL Gore, Atrium Maquet*

\* All consulting fees and grants paid to Mayo Clinic

# 19-YRS OF FENESTRATED GRAFTS



J. Parodi  
Buenos Aires



T. Browne  
Perth



M. Lawrence-Brown & D. Hartley  
Perth



J. Anderson  
Adelaide

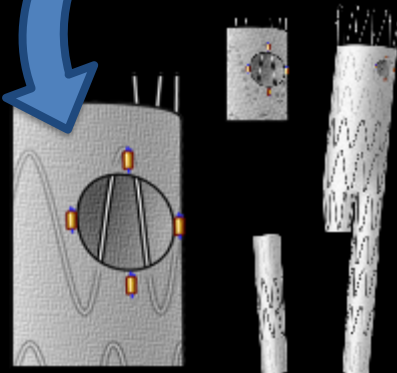


1991

1997

1998

Animal testing  
Fenestrated stent  
deployed over balloon



First implant  
Single left renal  
fenestration

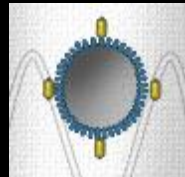


# DEVICE REFINEMENTS

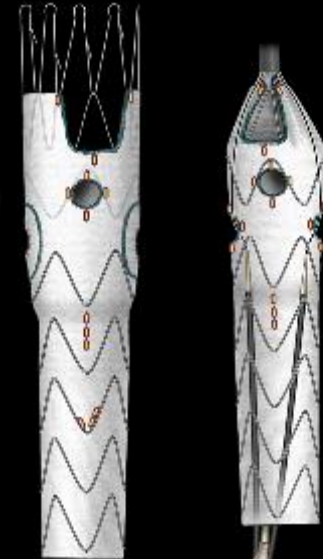
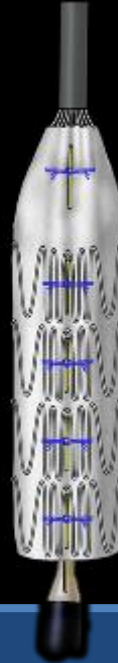


W. Stelter  
Germany

- Diameter Reducing ties

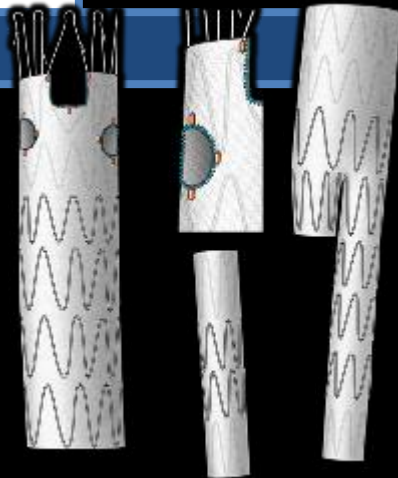


- Reinforced fenestrations
- Pivot fenestrations
- Pre-loaded system

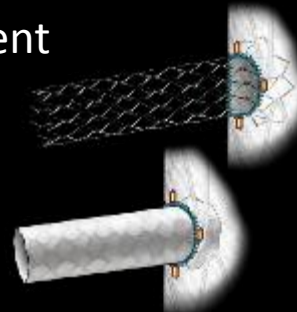


1998

- Separated fenestrated and bifurcated components



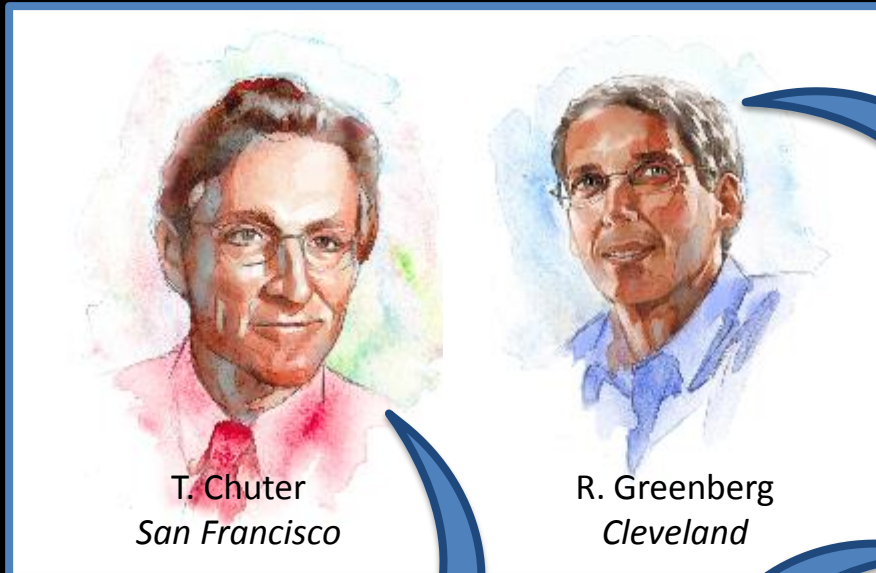
- Stent alignment



2015



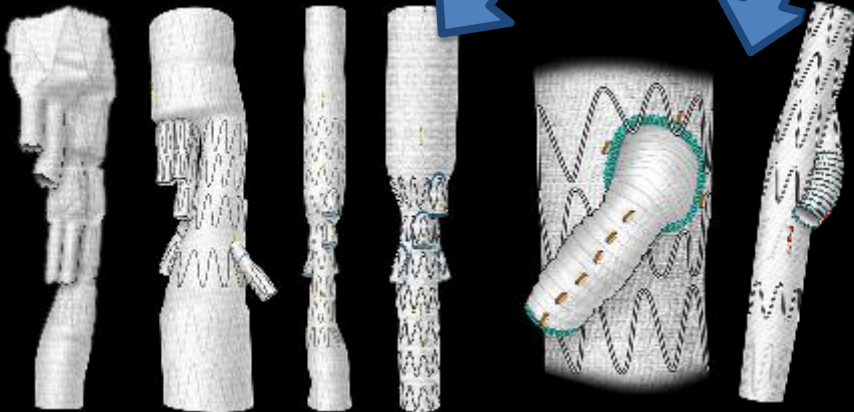
# DISSEMINATION OF F-BEVAR



T. Chuter  
San Francisco

R. Greenberg  
Cleveland

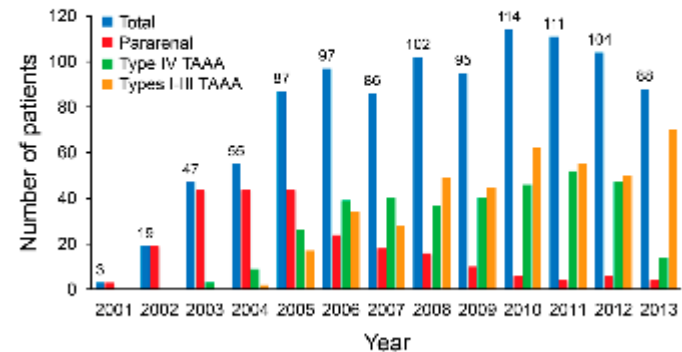
2001-Present



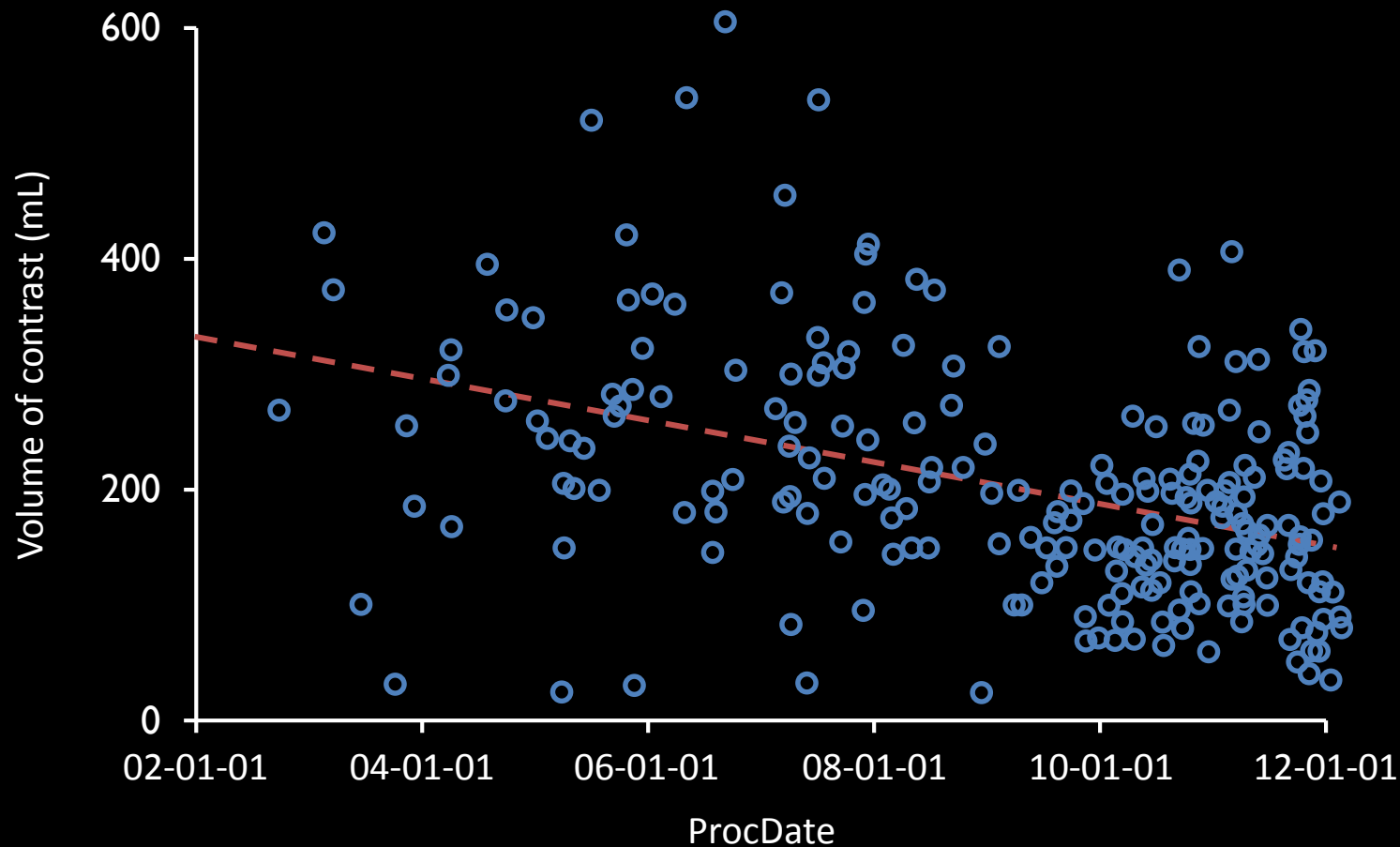
- National PI, ZFEN
- Largest worldwide experience (PS-IDEs)
- Helical branches

## Cleveland Clinic Experience Fenestrated and Branched Endografts

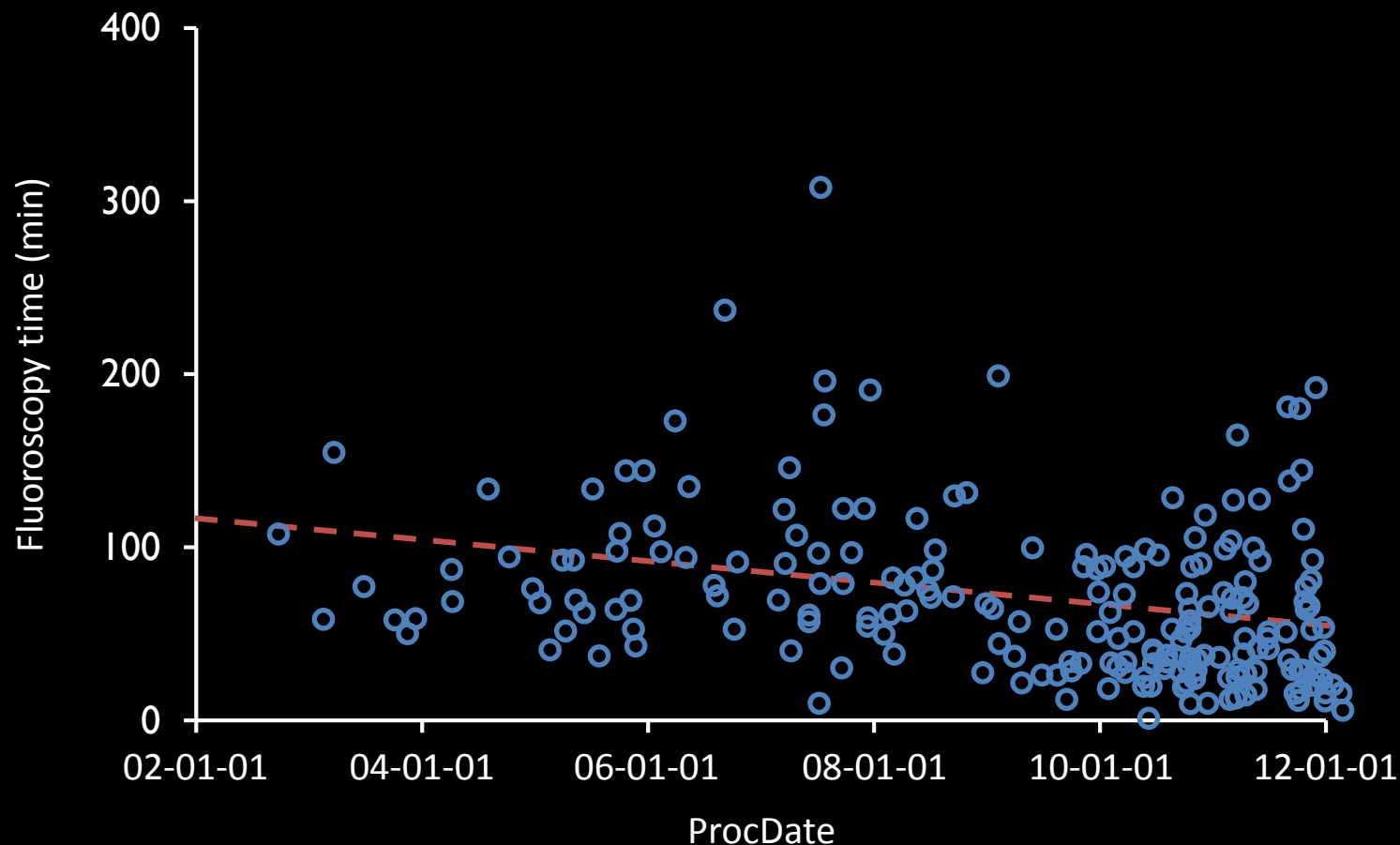
1008 Patients (2001 to 2013)



# Reduction in Contrast Volume



# Reduction in Fluoroscopy Time





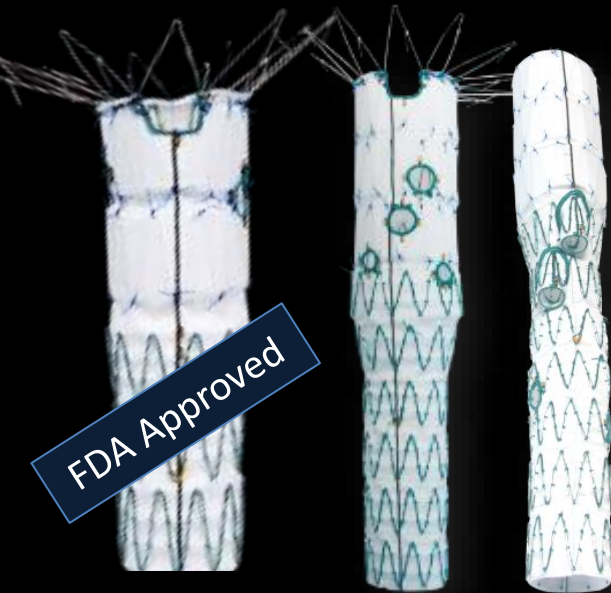
# LEARNING CURVE

|                   | <i>Patient</i> |                  |                   | P value |
|-------------------|----------------|------------------|-------------------|---------|
|                   | <i>1 to 80</i> | <i>81 to 160</i> | <i>161 to 240</i> |         |
| Pararenal         | 70%            | 74%              | 38%               | .01     |
| TAAA              | <b>30%</b>     | <b>26%</b>       | <b>62%</b>        | .01     |
| No. of Vessels    | 2.4±1.06       | 3.04±1.02        | 3.54±0.75         | .001    |
| 2-vessel          | 50%            | 29%              | 10%               | .001    |
| 4-vessel          | <b>19%</b>     | <b>41%</b>       | <b>65%</b>        | .001    |
| Fluoroscopy (min) | 117±61         | 84±38            | 72±23             | .05     |
| Contrast (ml)     | 237±99         | 163±73           | 138±75            | .001    |
| 30-day Mortality  | 5 (6%)         | 2 (3%)           | 0                 | .12     |



# VISCERAL BRANCH PIPELINE

## PATIENT-SPECIFIC



Cook Zenith®

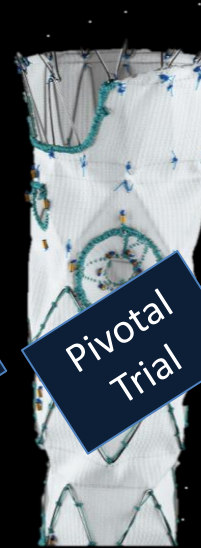


Fenestrated  
Anaconda™

## OFF-THE-SHELF



Endogix  
Ventana®



Cook  
p-Branch®



Cook  
t-Branch®



Gore  
TAMBE®

### Intended Indications for Use

Short Neck  
Juxtarenal

Pararenal  
TAAA

Pararenal

Short Neck  
Juxtarenal

Pararenal

Pararenal  
TAAA

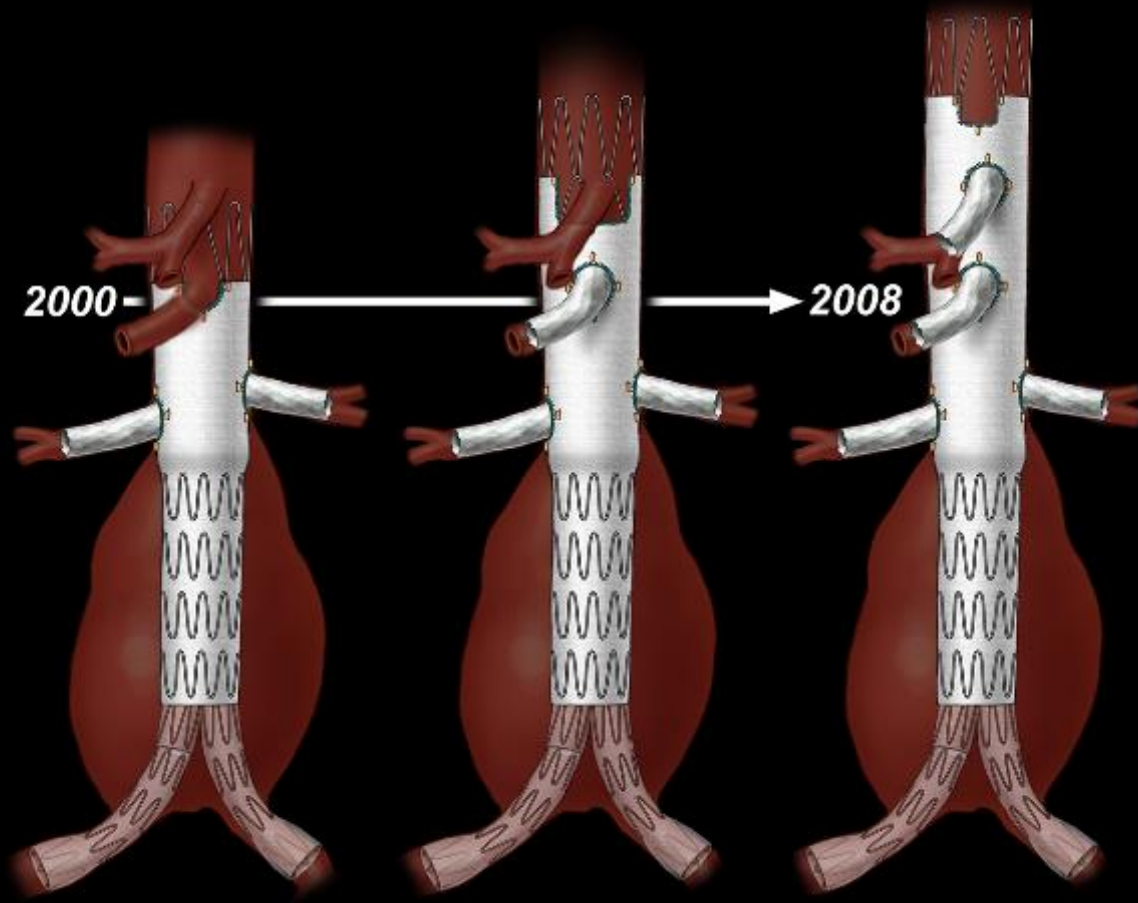
# TIP 1 PATIENT SELECTION

Multiple, small renal arteries

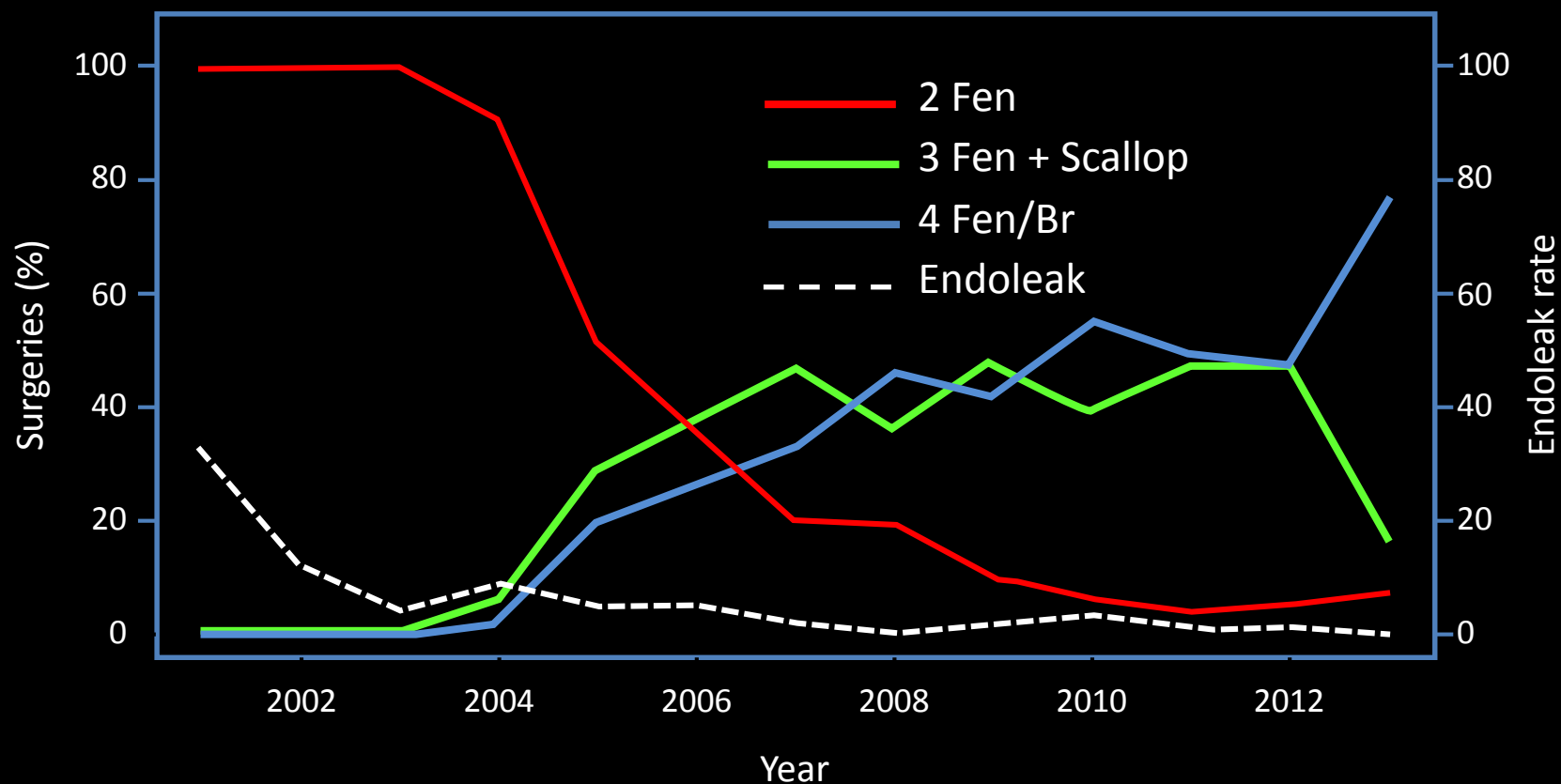
Excessive angulation

'Shaggy' Aorta

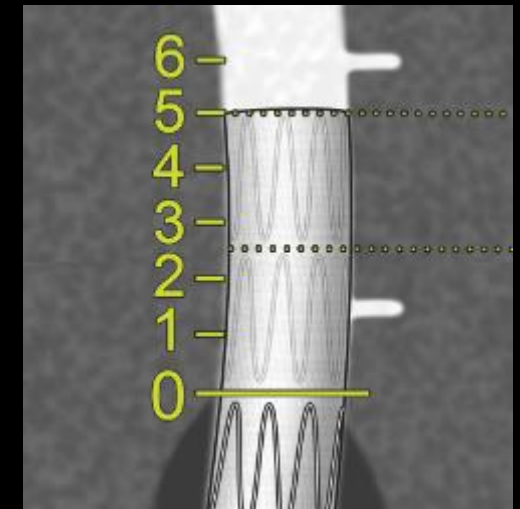
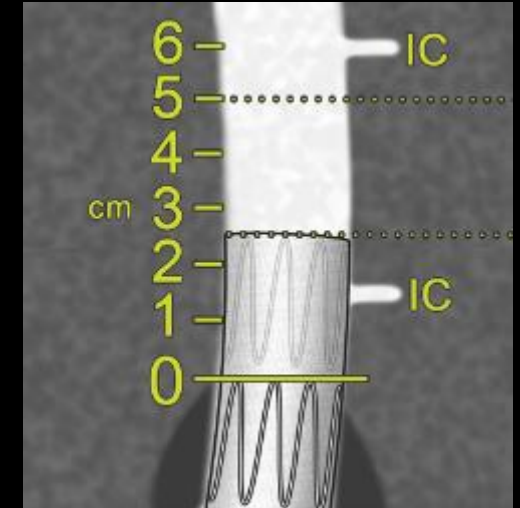
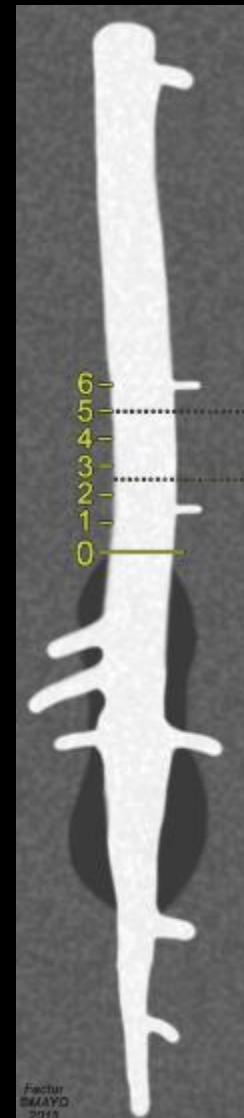
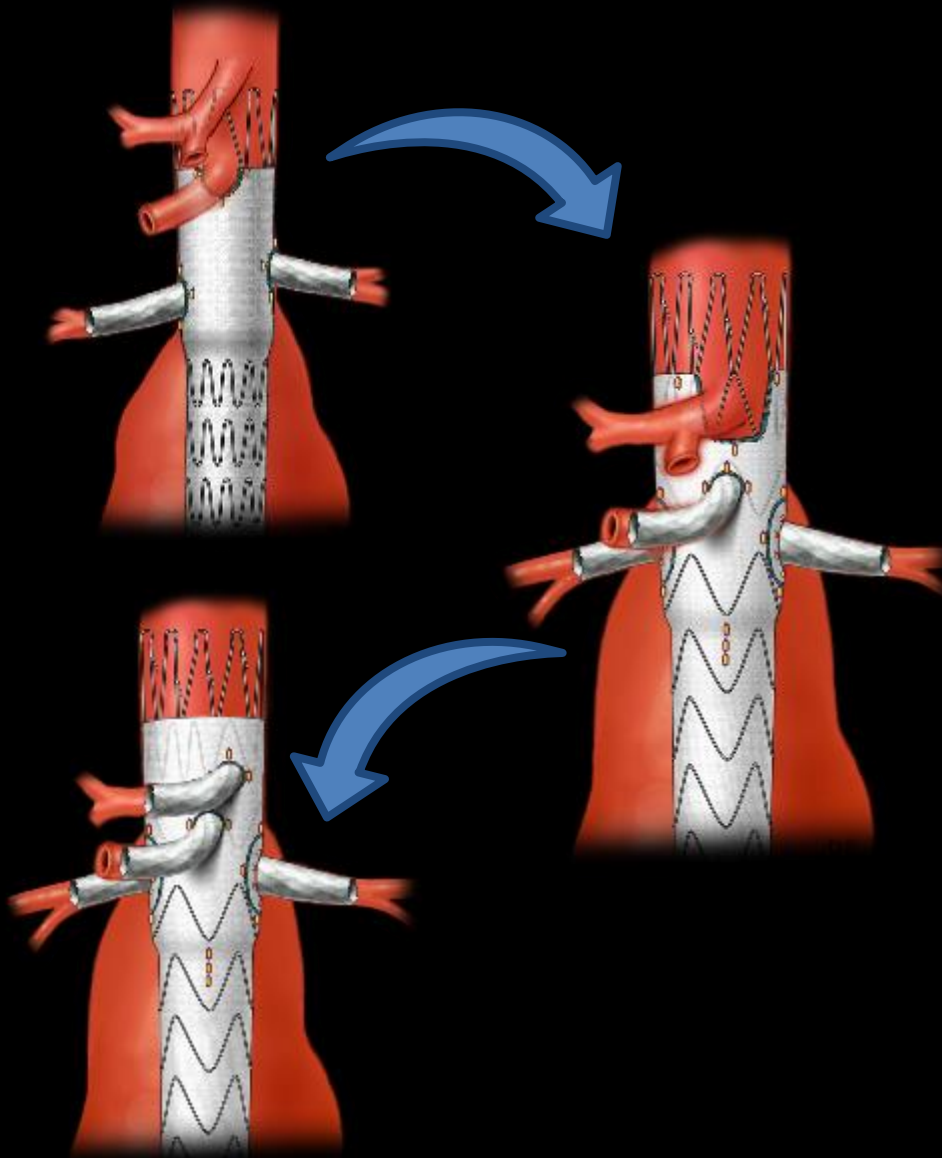
# TIP 2 SELECT HEALTHY LANDING ZONES



# MORE VESSELS, LESS LEAKS







# ANATOMICAL & PROCEDURAL DATA

260 patients enrolled in the study

|                           | IC<br>n=173 | LSC<br>n = 55 | HSC<br>n = 32 | P     |
|---------------------------|-------------|---------------|---------------|-------|
| Aneurysm diameter (mm)    | 60± 10      | 62± 13        | 63 ± 7        | .22   |
| Target vessels / patient  | 2.9 ± 0.6   | 3.9 ± 0.6     | 3.8 ± 0.6     | <.001 |
| Technical success         | 100%        | 98%           | 100%          | .34   |
| Supraceliac coverage (mm) | 0           | 22±11         | 57±19         | <.001 |
| Estimated blood loss (ml) | 408±365     | 426±318       | 346±164       | .57   |
| Contrast volume (ml)      | 94 ± 39     | 121 ± 40      | 109 ± 45      | <.001 |
| Fluoroscopy time (min)    | 67 ± 38     | 75±23         | 85 ± 38       | <.001 |
| OR time (min)             | 216±80      | 258±127       | 292 ± 96      | <.001 |
| Type Ia endoleak**        | 4%          | 2%            | 0             | .42   |

\* Data presented as n (%) or Mean ± Standard Deviation

\*\* Defined by completion angiography

# EARLY OUTCOMES

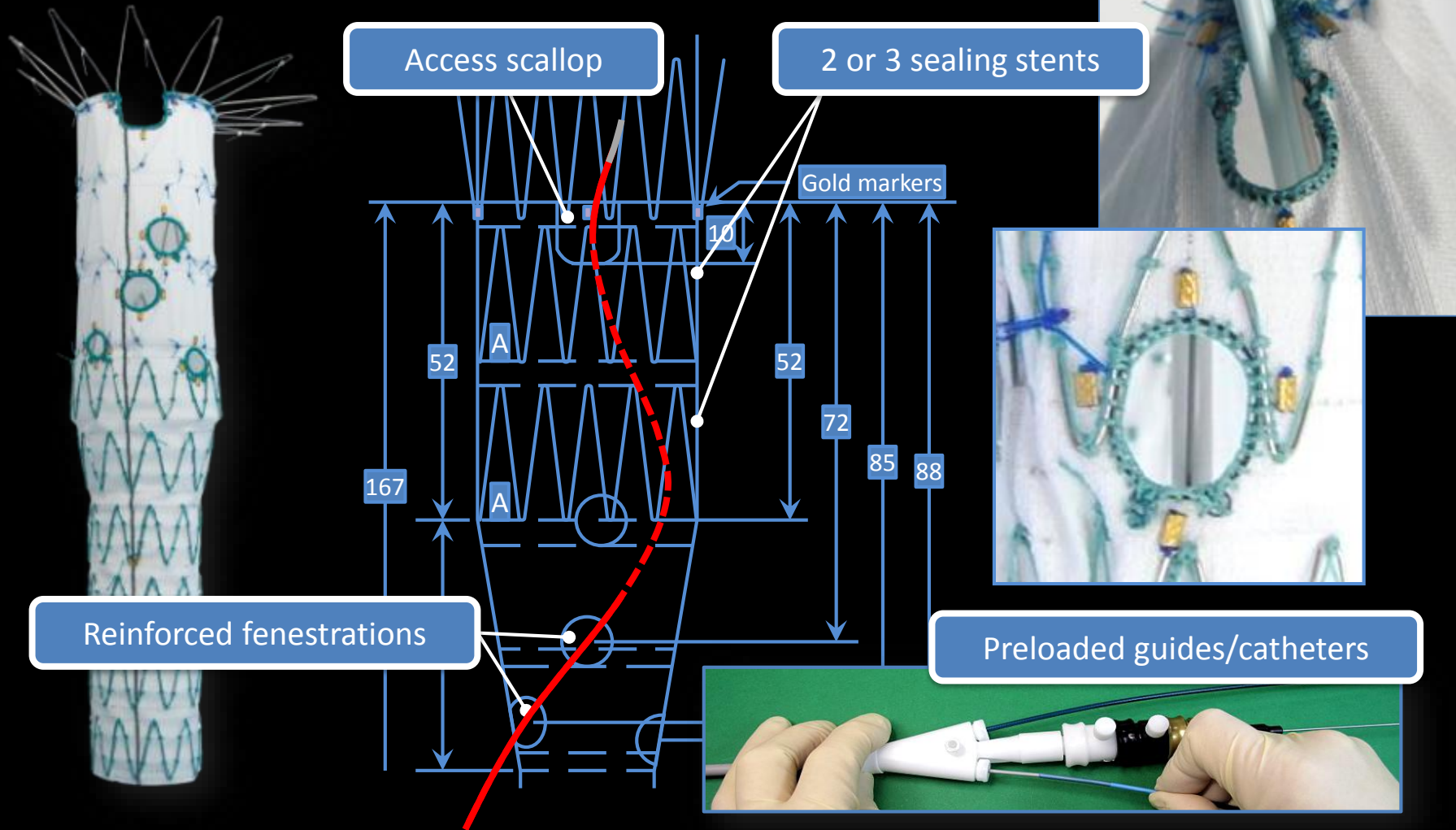
30-day or In-hospital mortality, 4/260 (1.5%)

|                                | IC<br>n=173 | LSC<br>n = 55 | HSC<br>n = 32 | P   |
|--------------------------------|-------------|---------------|---------------|-----|
| 30 day mortality               | 1.7%        | 1.9%          | 0             | .1  |
| Major adverse events           | 15%         | 13%           | 16%           | .93 |
| EBL>1000ml                     | 6%          | 2%            | 0             | .35 |
| Renal failure (Cr > 1.5 mg/dl) | 4%          | 6%            | 3%            | .89 |
| Myocardial infarction          | 1%          | 4%            | 10%           | .02 |
| Respiratory failure            | 2%          | 8%            | 0             | .09 |
| Paraplegia *                   | 0           | 2%            | 3%            | .11 |
| Stroke                         | 0           | 2%            | 0             | .33 |
| Bowel ischemia                 | 3%          | 6%            | 0             | .53 |

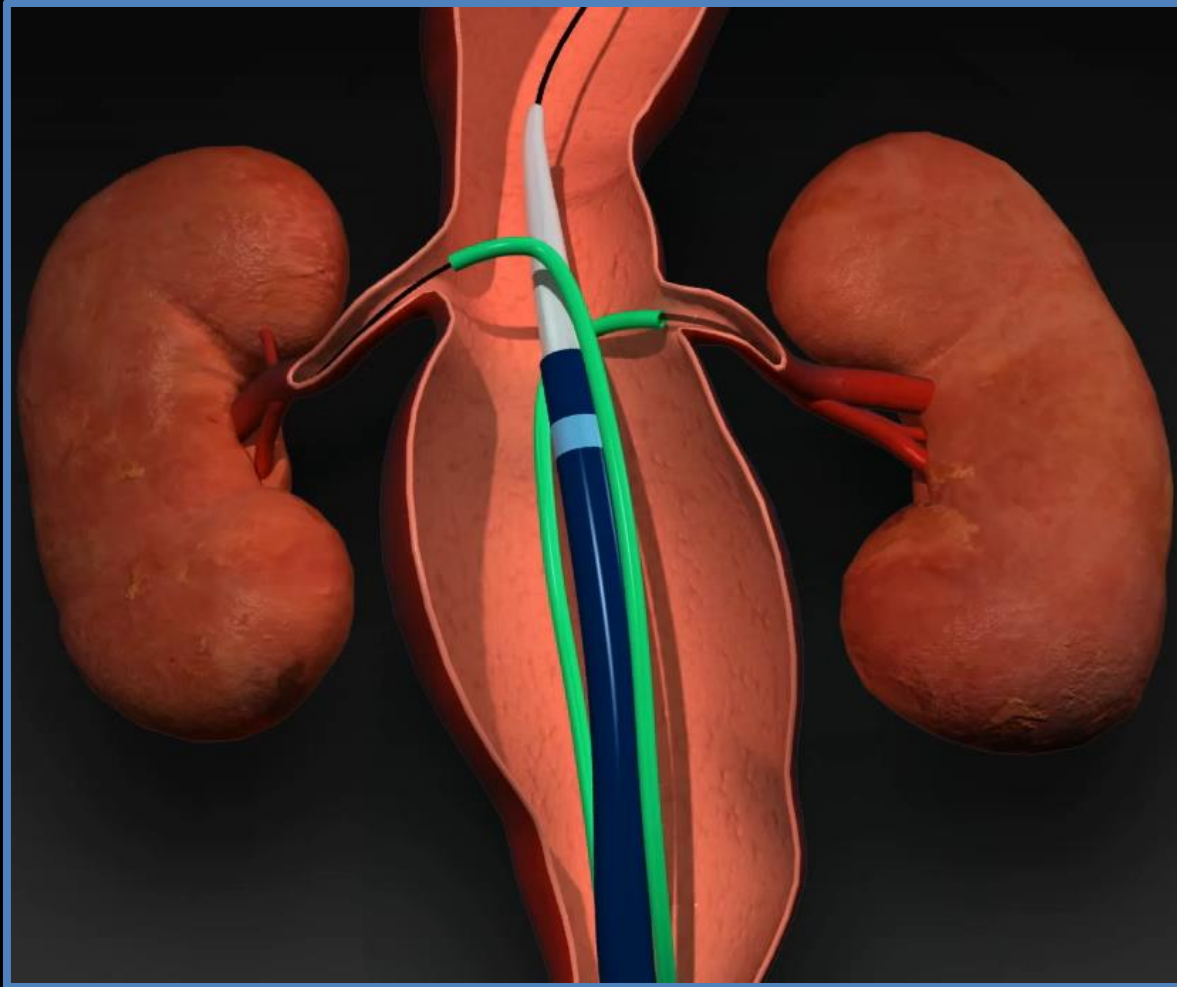
\* Data presented as n (%) or Mean  $\pm$  Standard Deviation



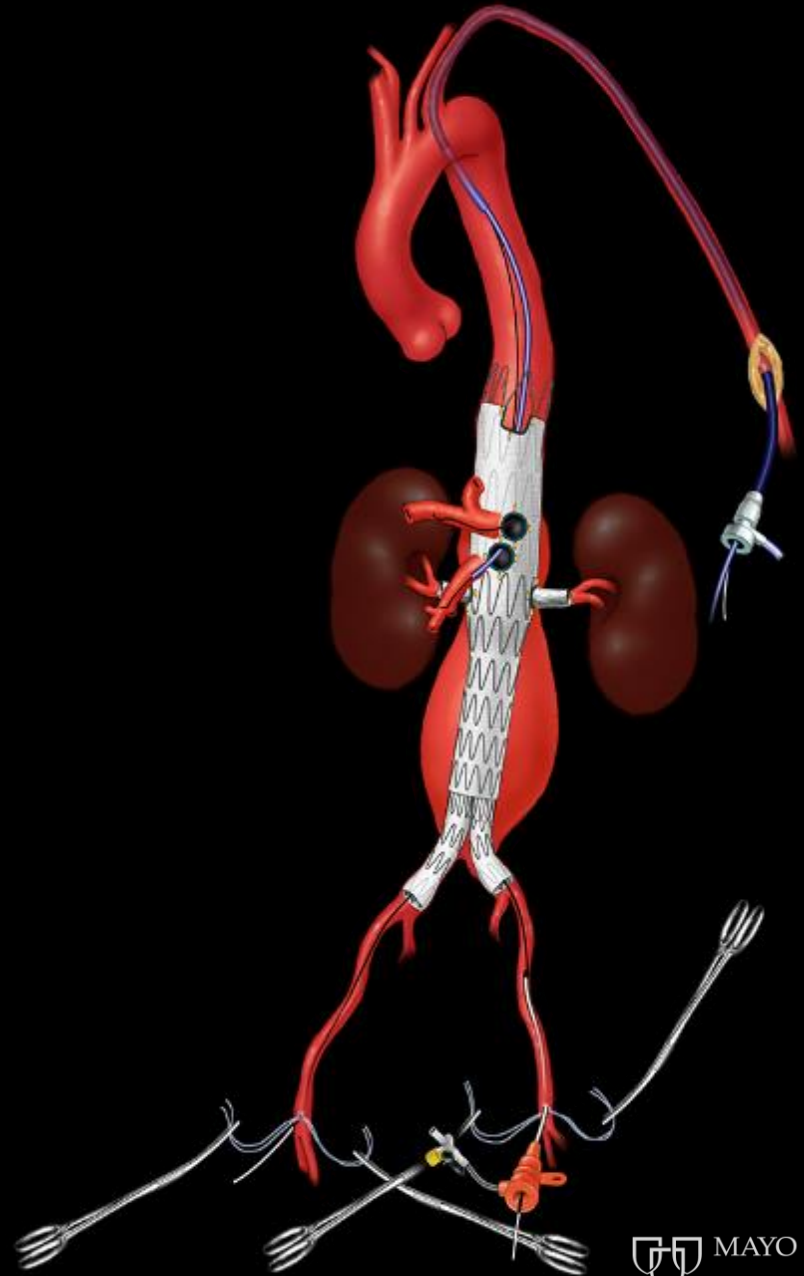
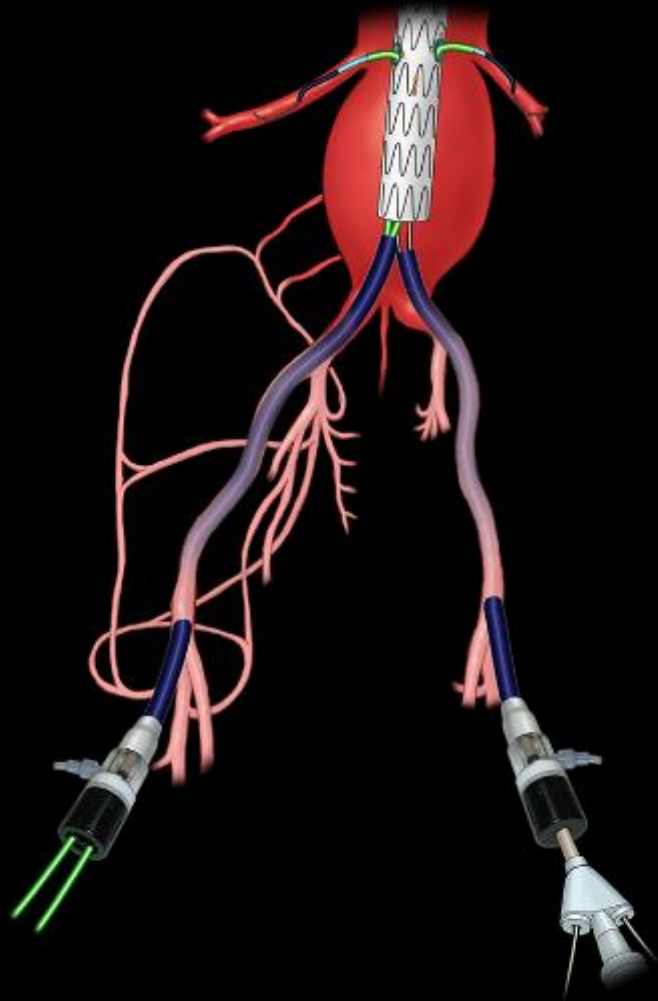
# TIP 3 OPTIMAL DESIGN



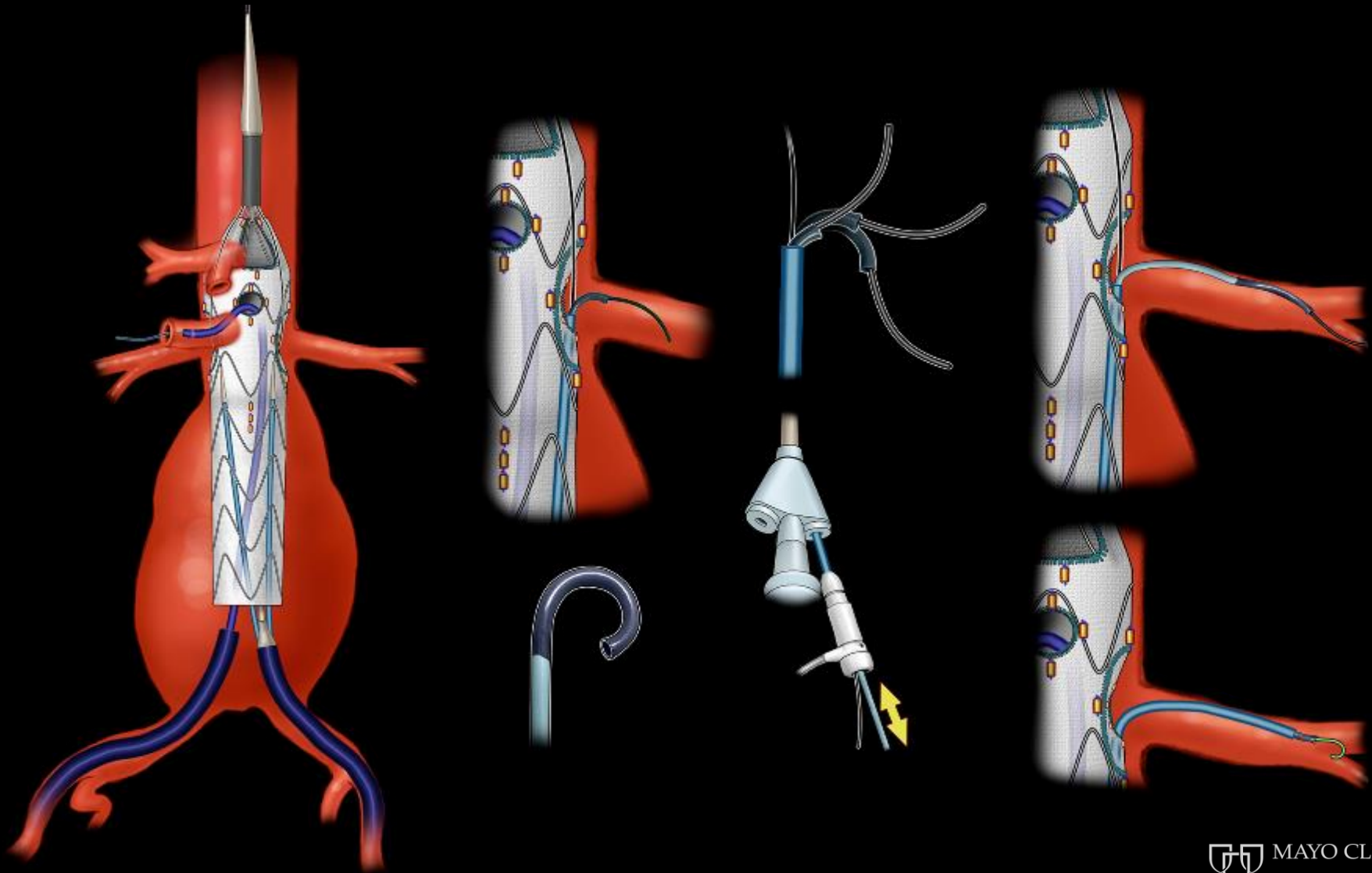
# PRE-LOADED CATHETERS



# BRACHIAL ACCESS

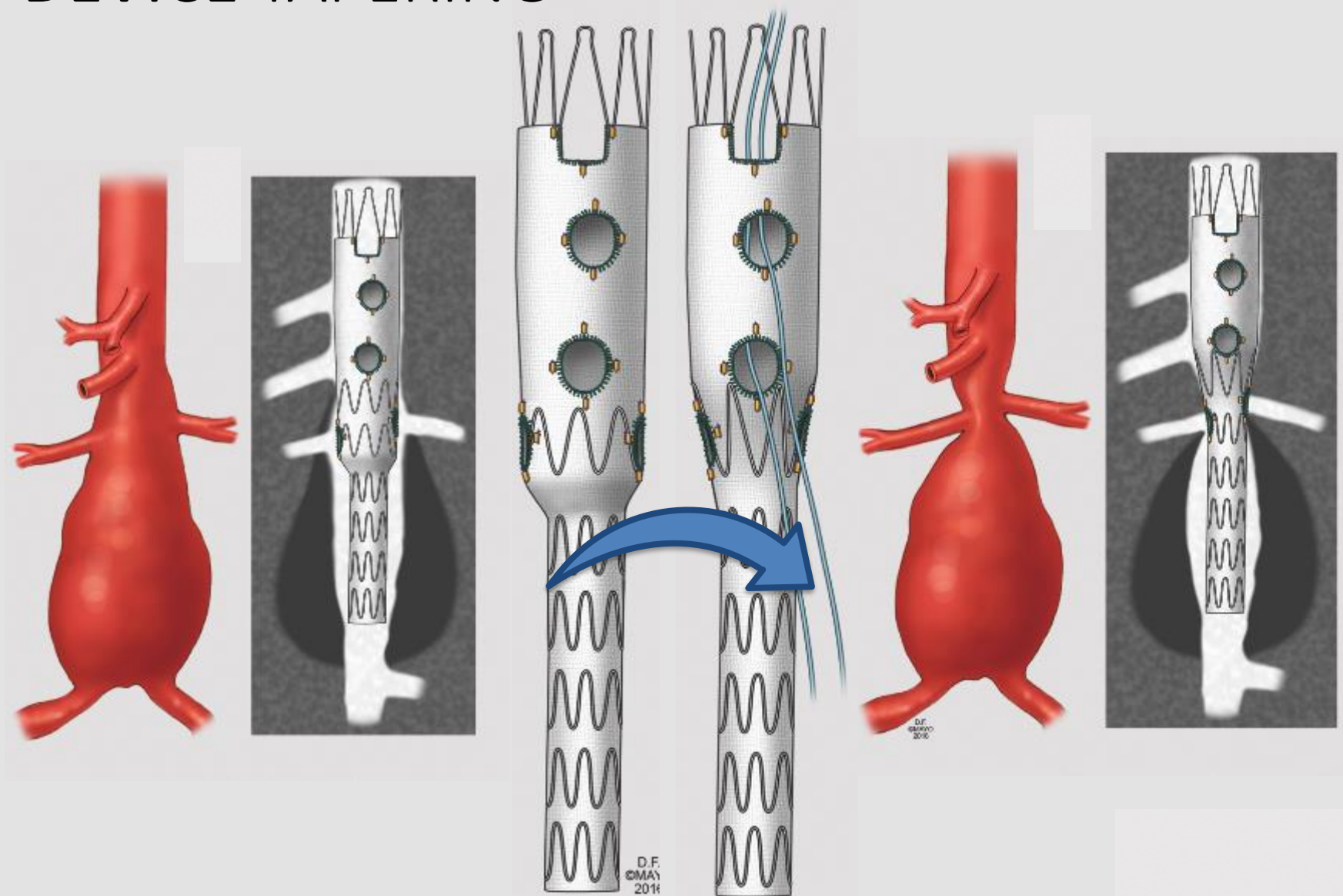


# PRE-LOADED RENAL GUIDES

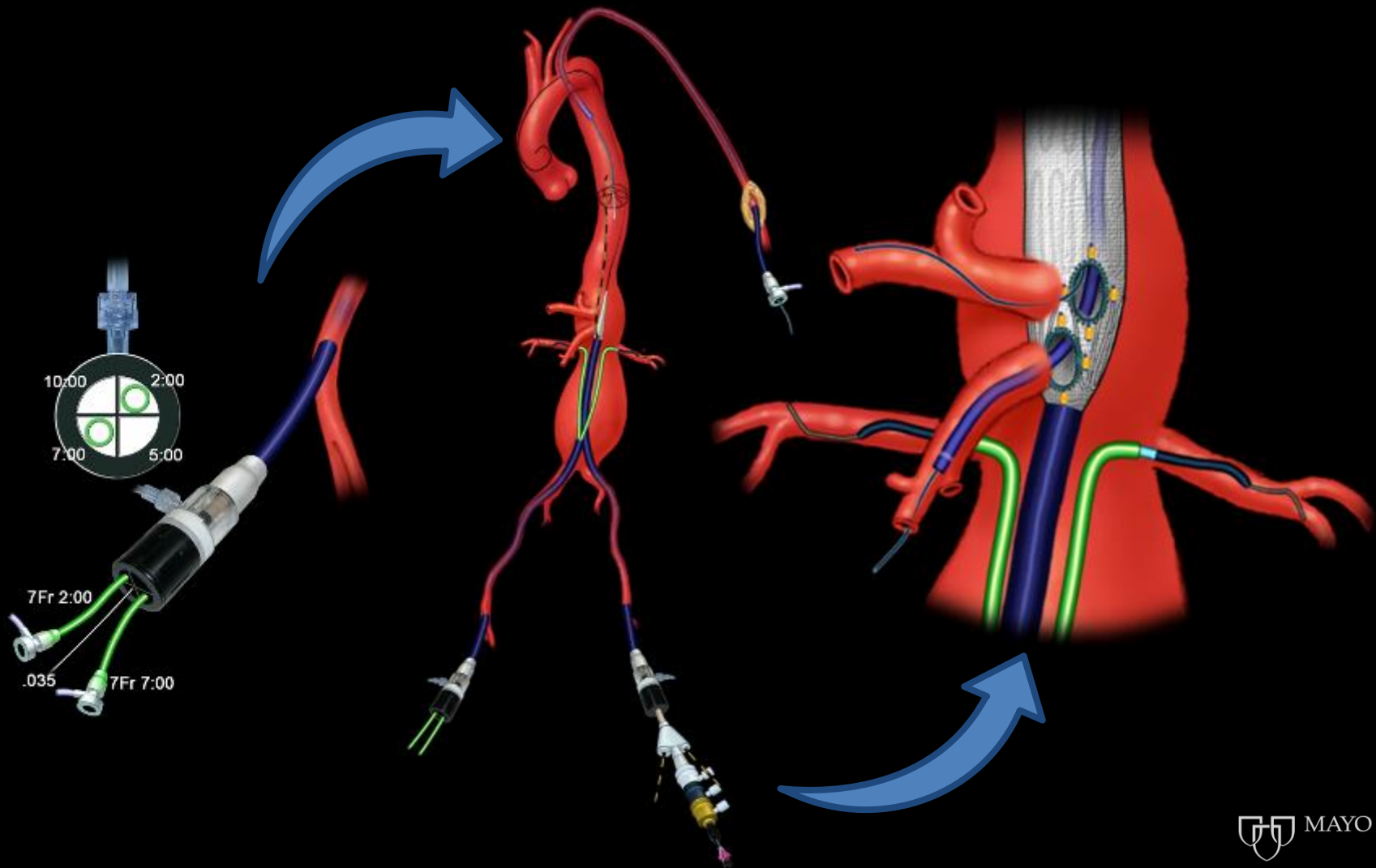




# DEVICE TAPERING

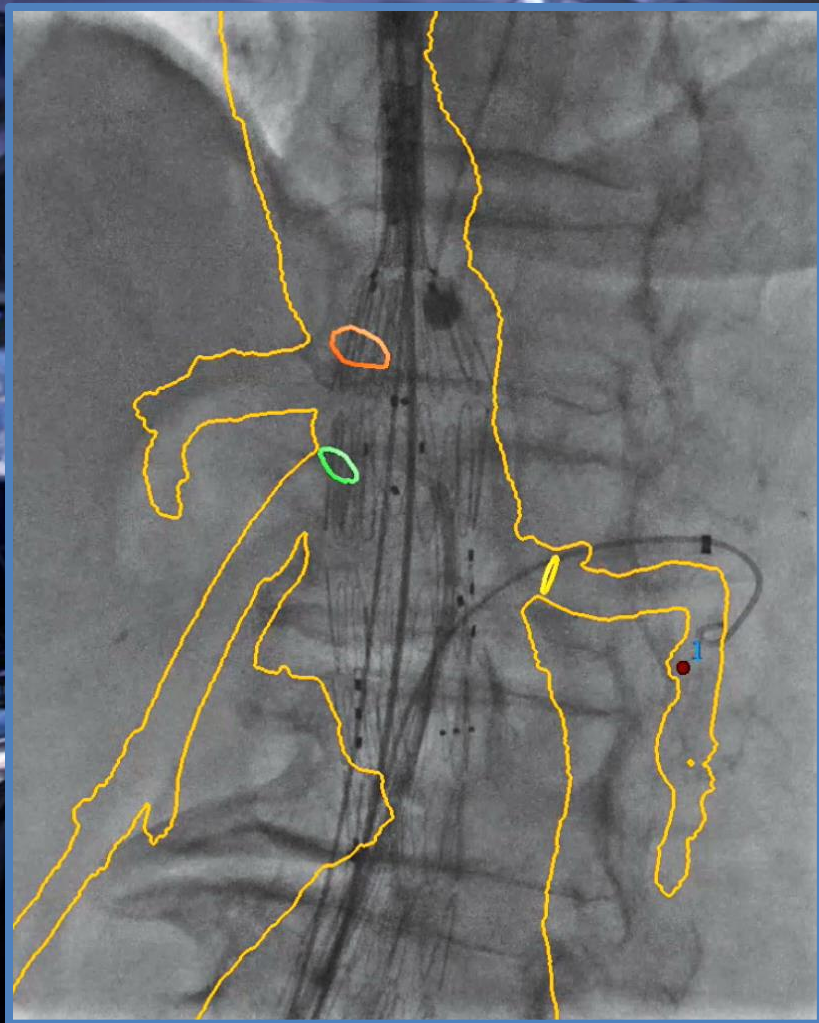


# TIP 4 MINIMIZE CONTRAST & RADIATION

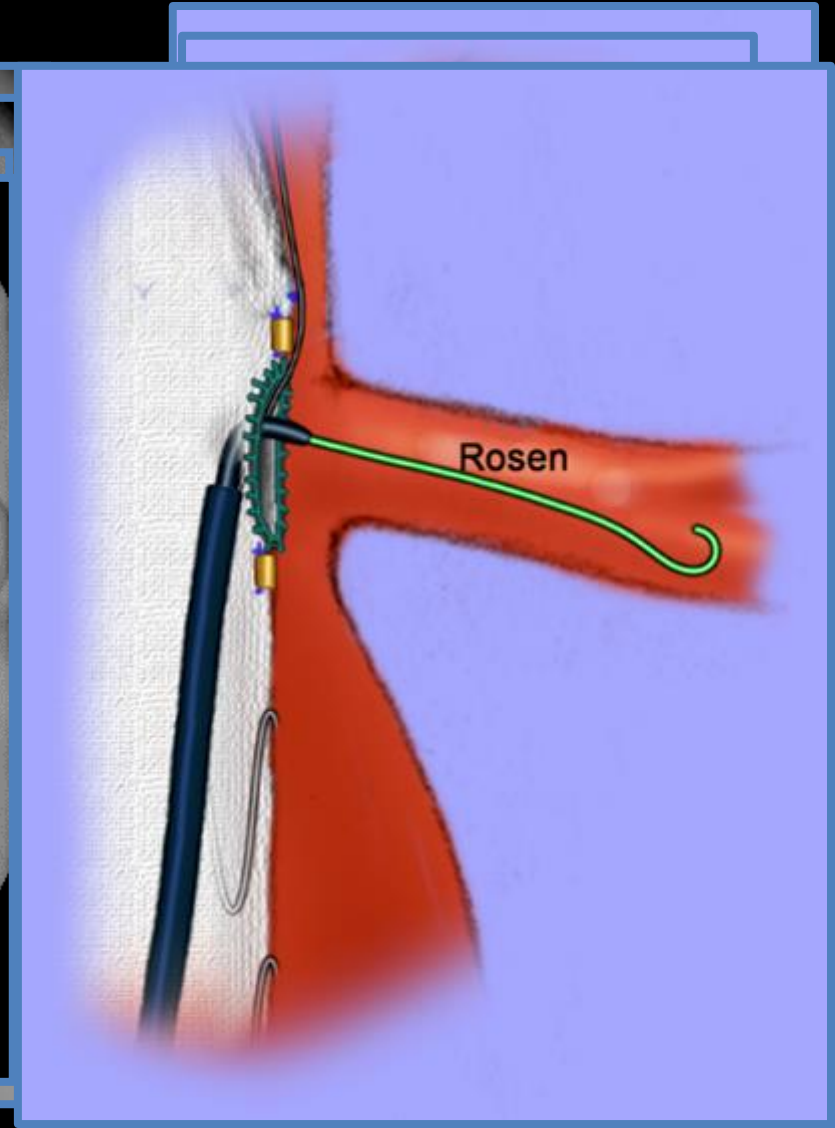
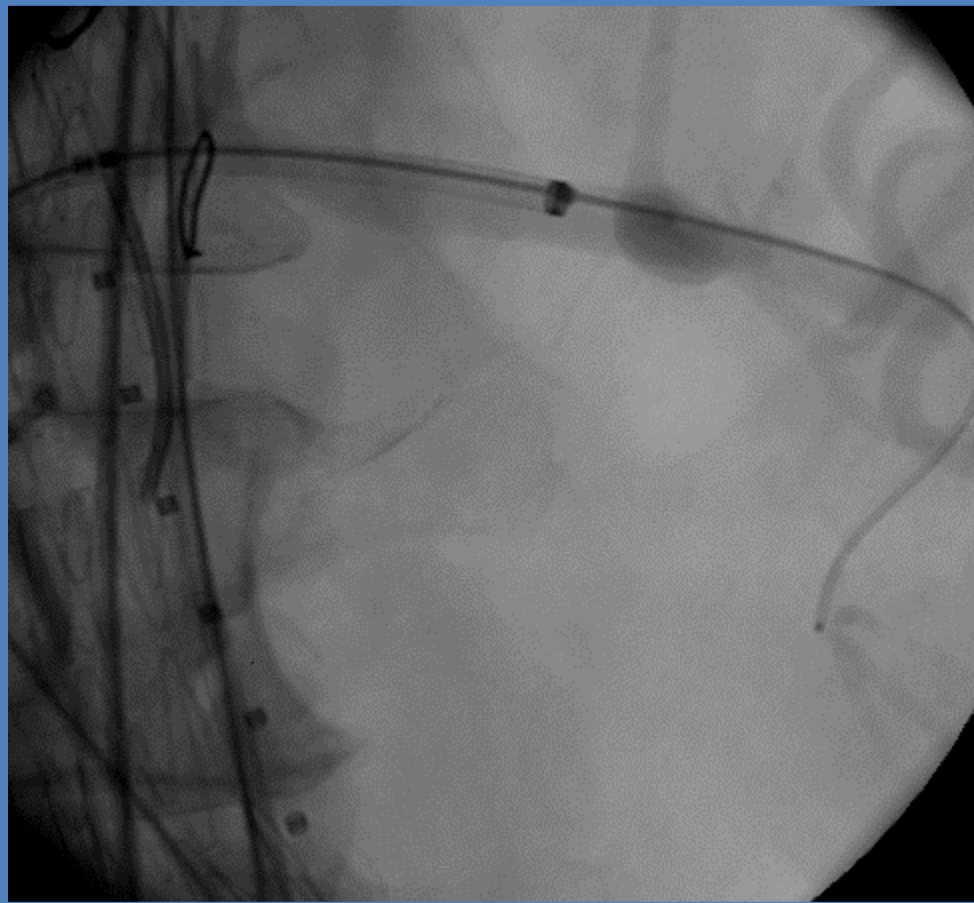




# FUSION IMAGING

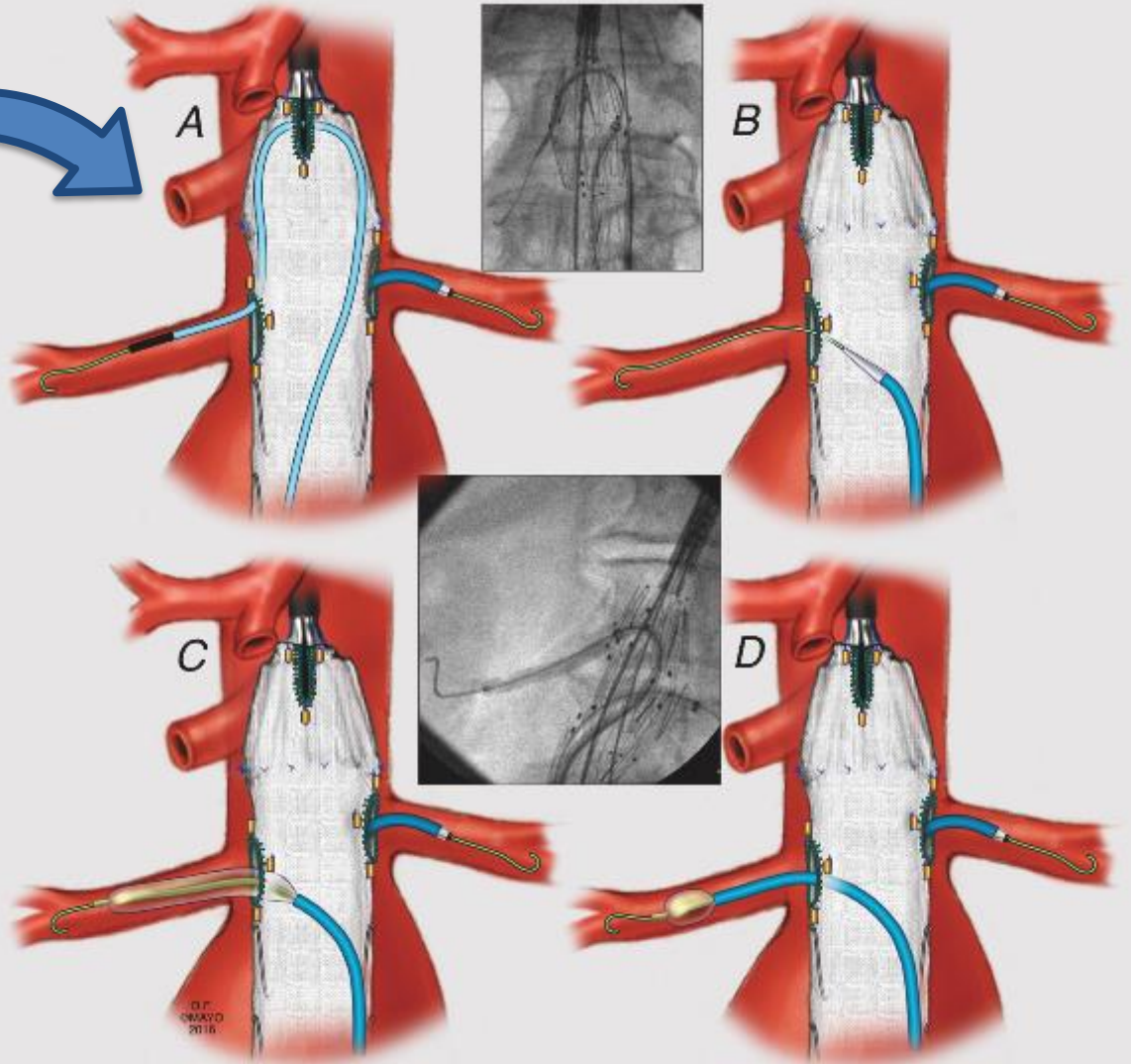


# TIP 5 VESSEL CATHETERIZATION

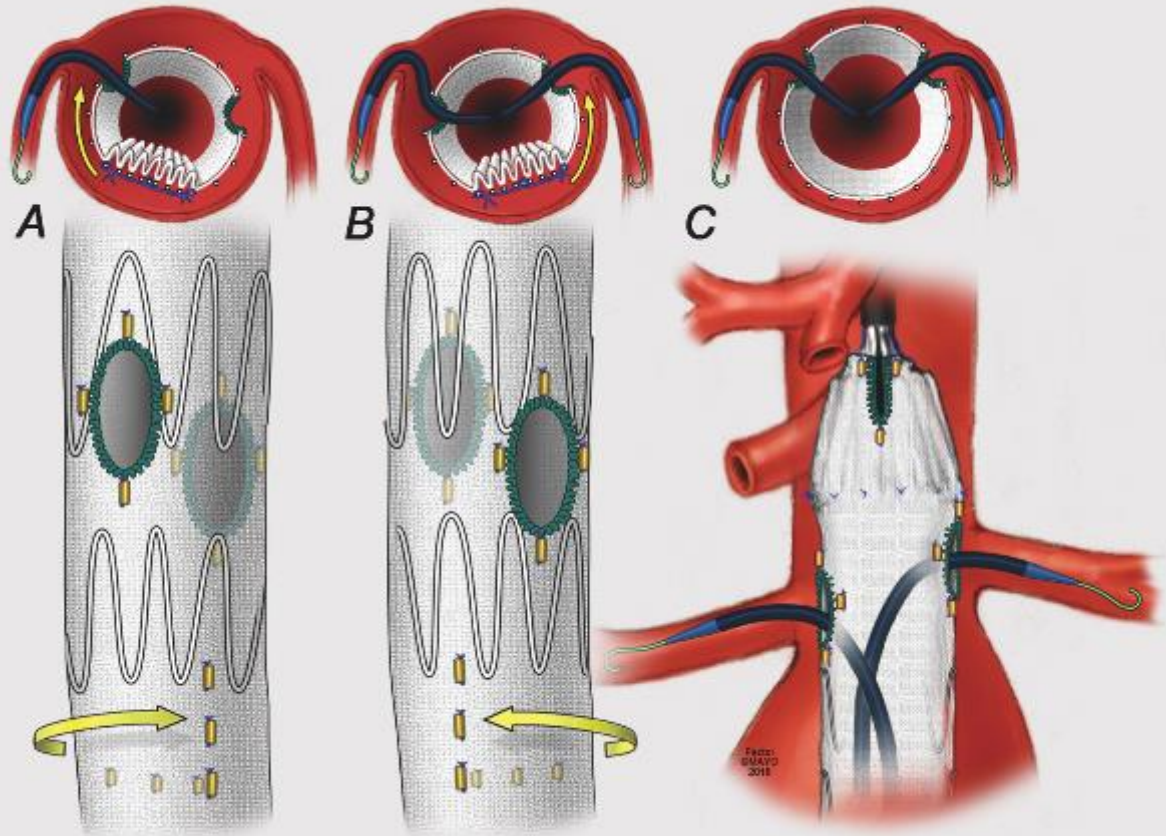
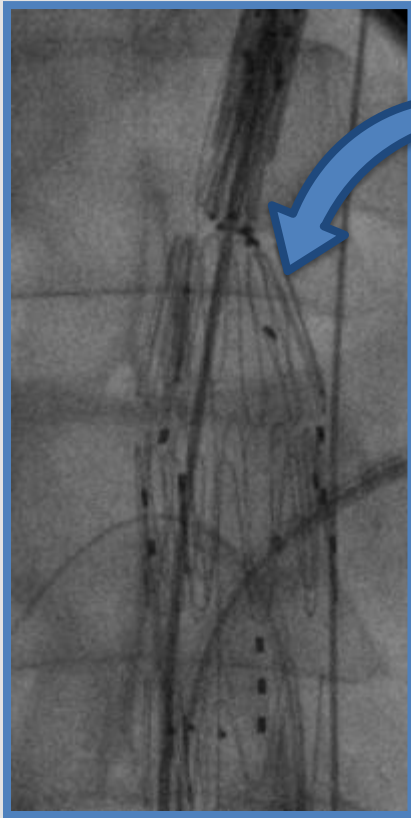


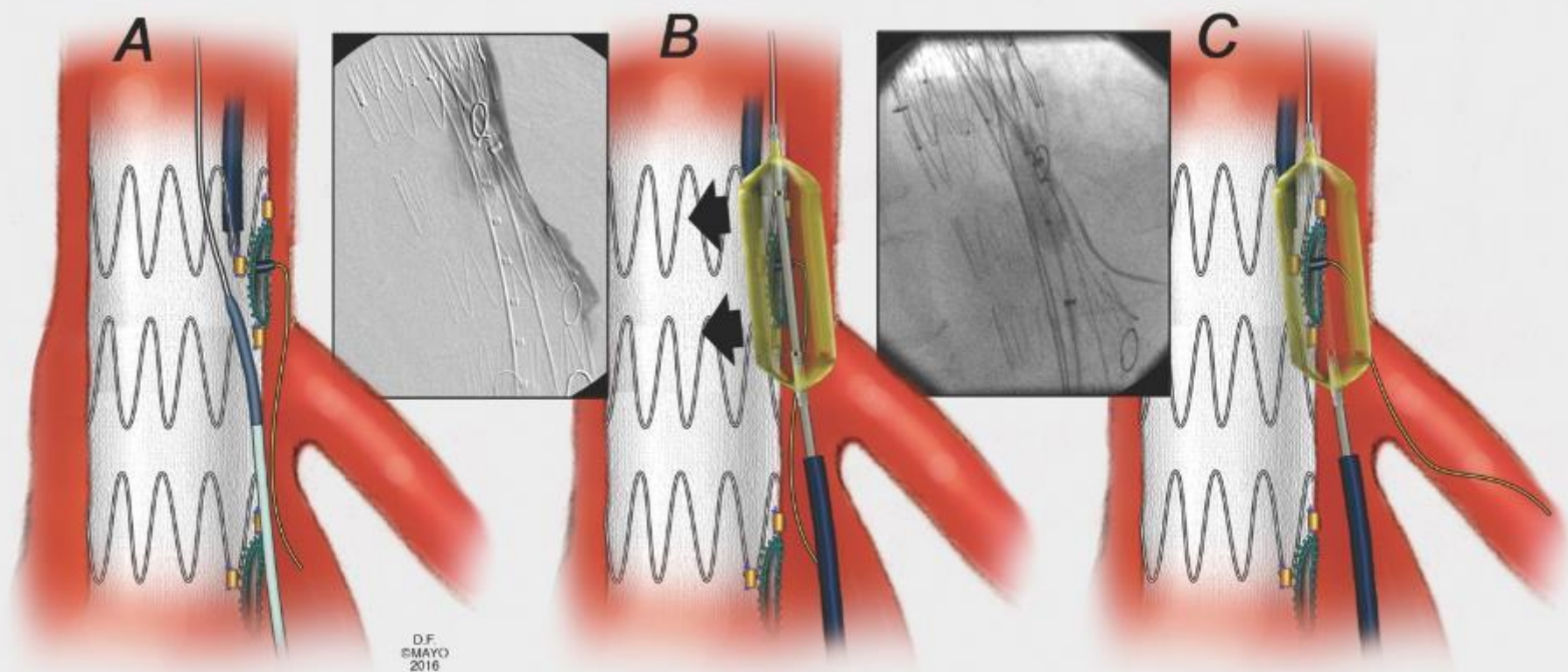


# DOWN-GOING VESSELS



# TIP 6 VESSEL MISALIGNMENT



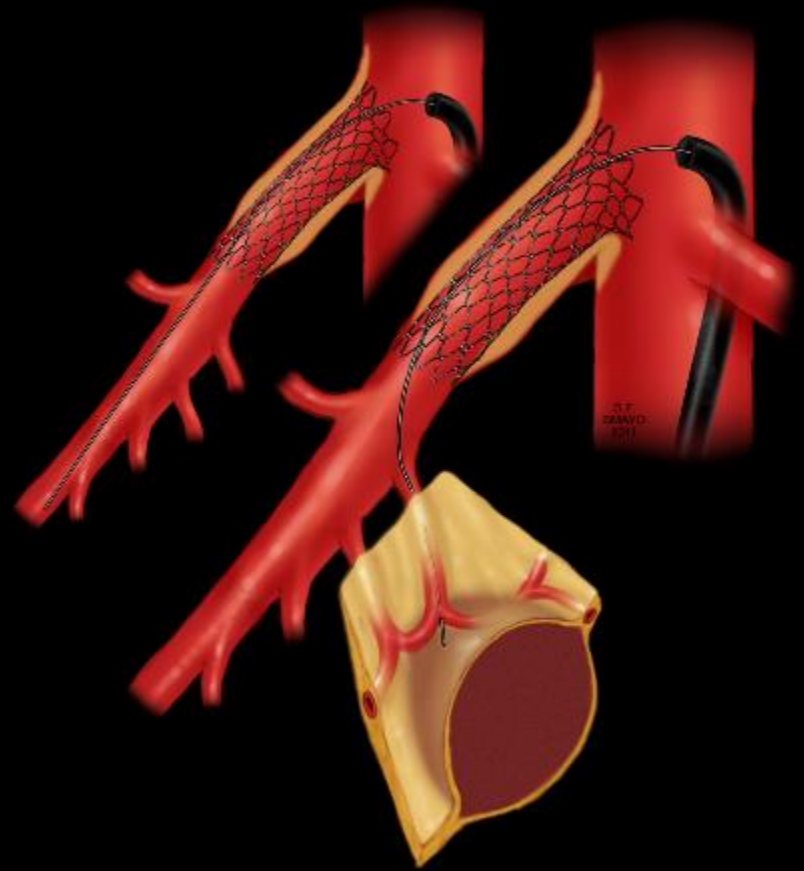




# TIP 7 FINESSE

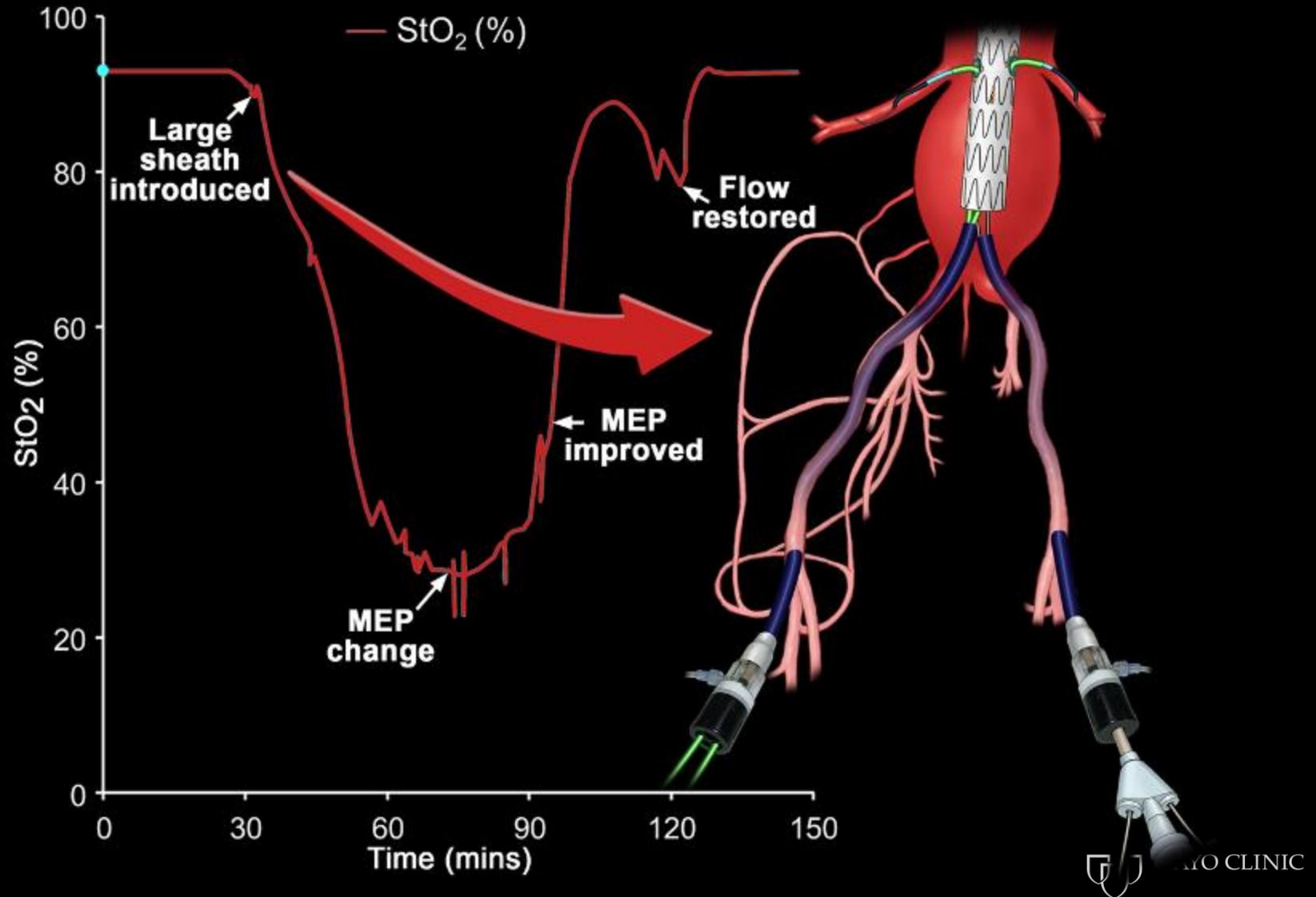
*Dissection, disruption, perforation*

- Visualize wire tip
- Avoid stiff wires in tiny branches
- Select proper wire (e.g. Renals > Rosen)
- Small injections





# TIP 8 AVOID LIMB ISCHEMIA



# EARLY LIMB REPERFUSION

Eur J Vasc Endovasc Surg (2015) 49, 248–254

## Editor's Choice — The Impact of Early Pelvic and Lower Limb Reperfusion and Attentive Peri-operative Management on the Incidence of Spinal Cord Ischemia During Thoracoabdominal Aortic Aneurysm Endovascular Repair

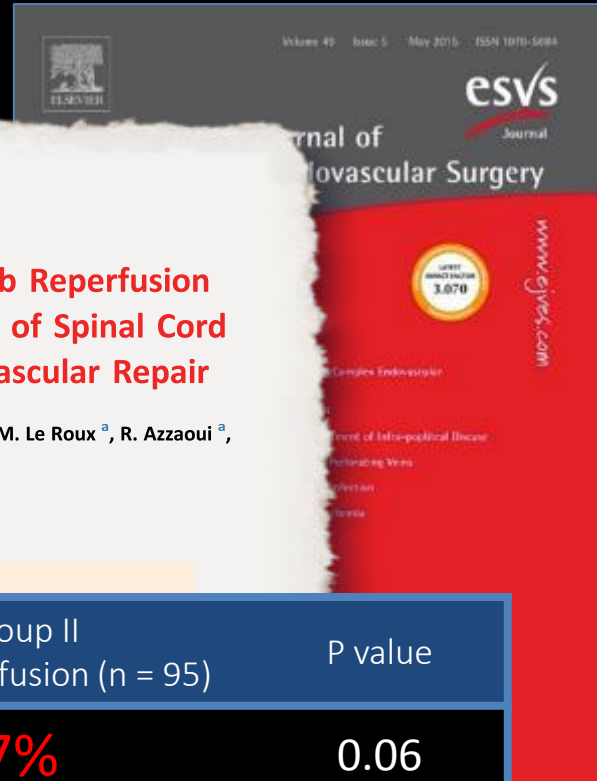
B. Maurel<sup>a</sup>, N. Delclaux<sup>a</sup>, J. Sobocinski<sup>a</sup>, A. Hertault<sup>a</sup>, T. Martin-Gonzalez<sup>a</sup>, M. Moussa<sup>a</sup>, R. Spear<sup>a</sup>, M. Le Roux<sup>a</sup>, R. Azaoui<sup>a</sup>, M. Tyrrell<sup>b</sup>, S. Haulon<sup>a,\*</sup>

<sup>a</sup> Aortic Centre, Hôpital Cardiologique, CHRU de Lille, INSERM U1008, Université Lille Nord de France, 59037 Lille Cedex, France

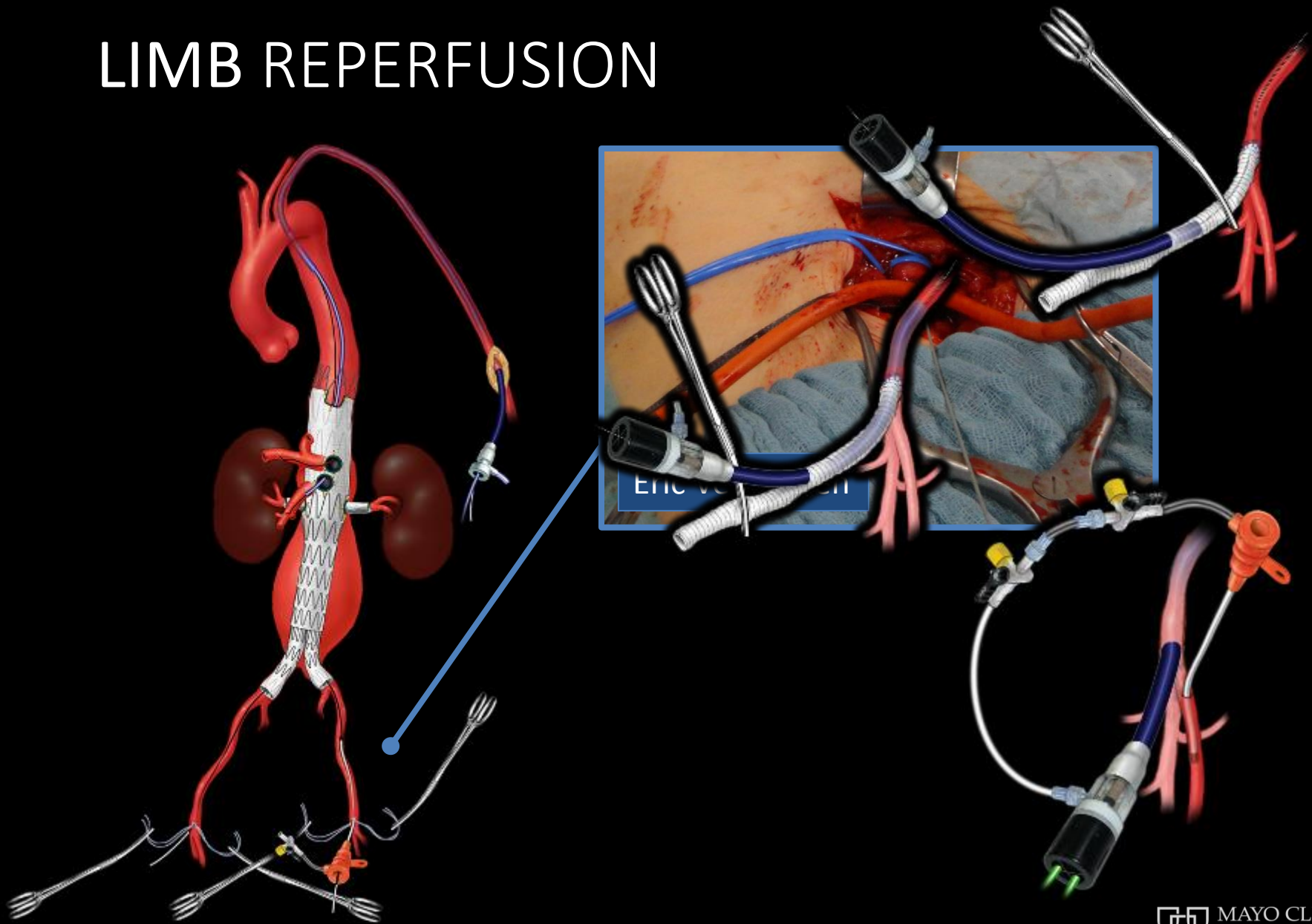
<sup>b</sup> King's Health Partners, London, UK

### WHAT THIS PAPER ADDS

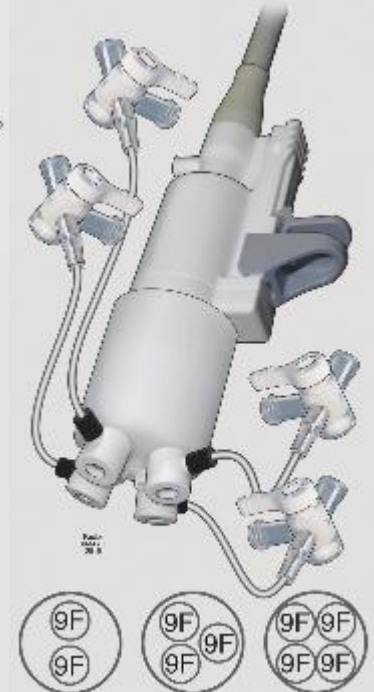
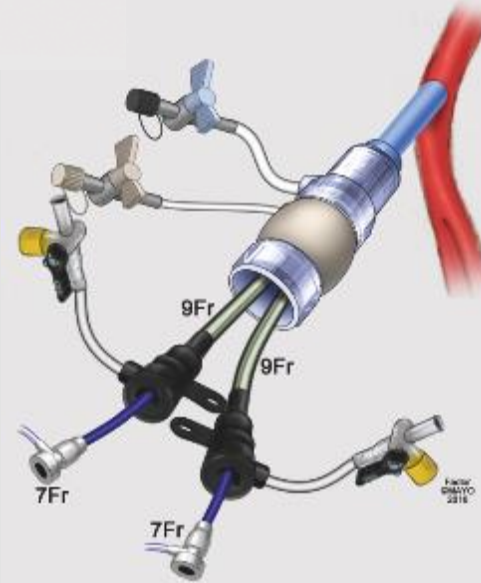
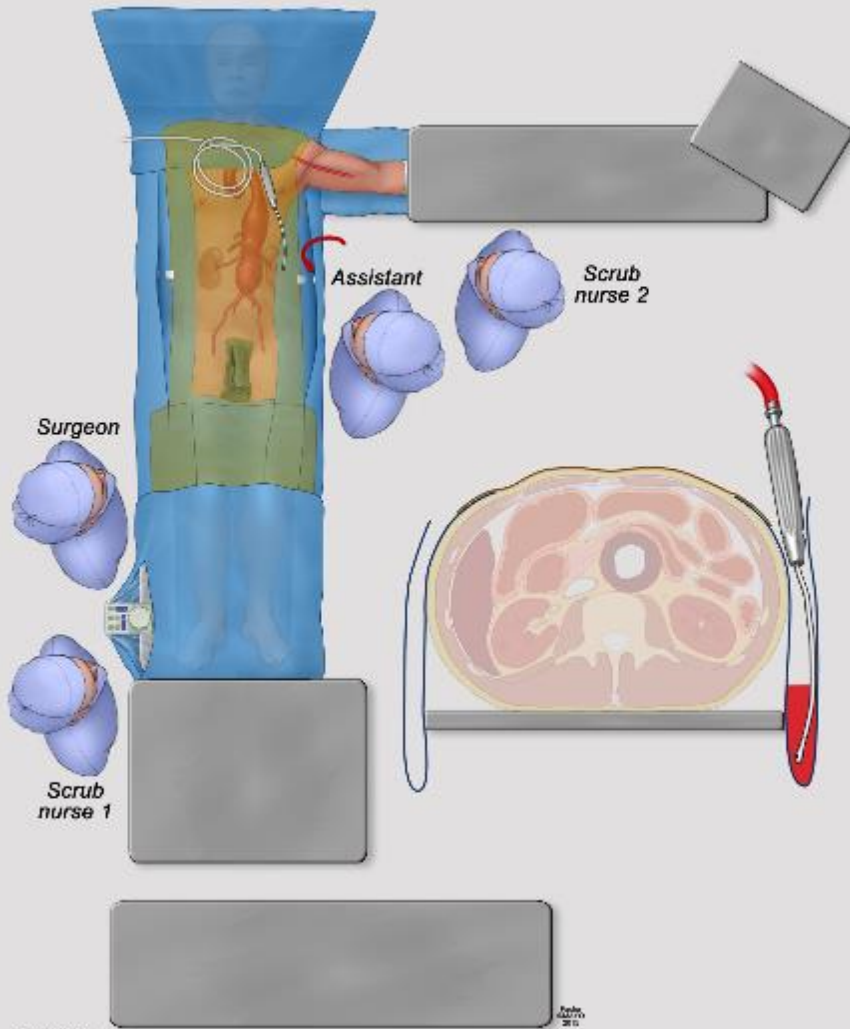
|                      | Group I<br>Standard (n = 24) | Group II<br>Early Reperfusion (n = 95) | P value |
|----------------------|------------------------------|----------------------------------------|---------|
| 30d mortality        | 21%                          | 7%                                     | 0.06    |
| Spinal Cord Ischemia | 25%                          | 2%                                     | <0.001  |
| Major complications  | 50%                          | 27%                                    | 0.04    |



# LIMB REPERFUSION



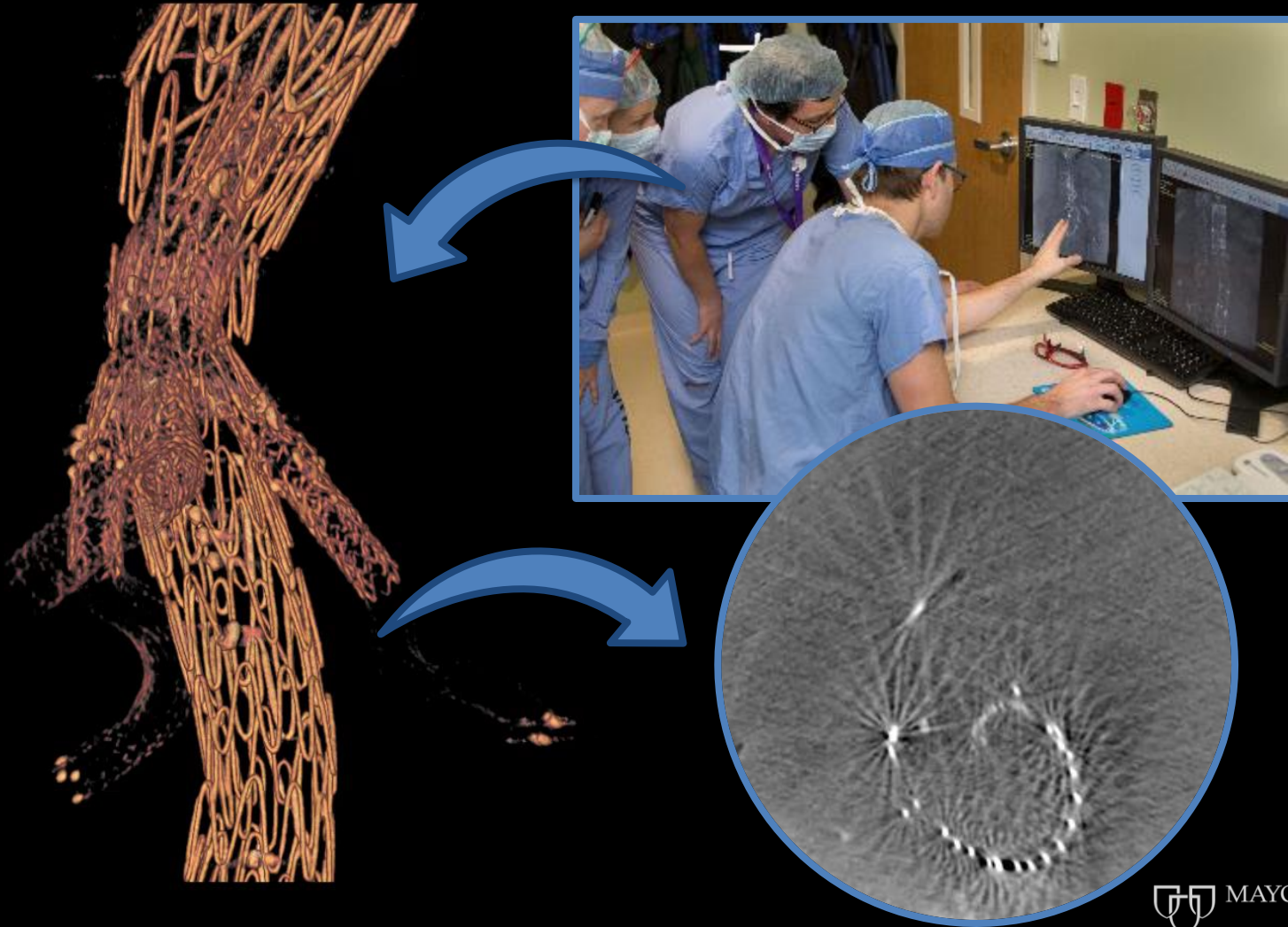
# TIP 9 MINIMIZE BLOOD LOSS



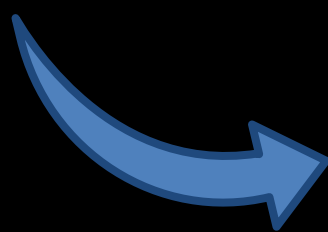
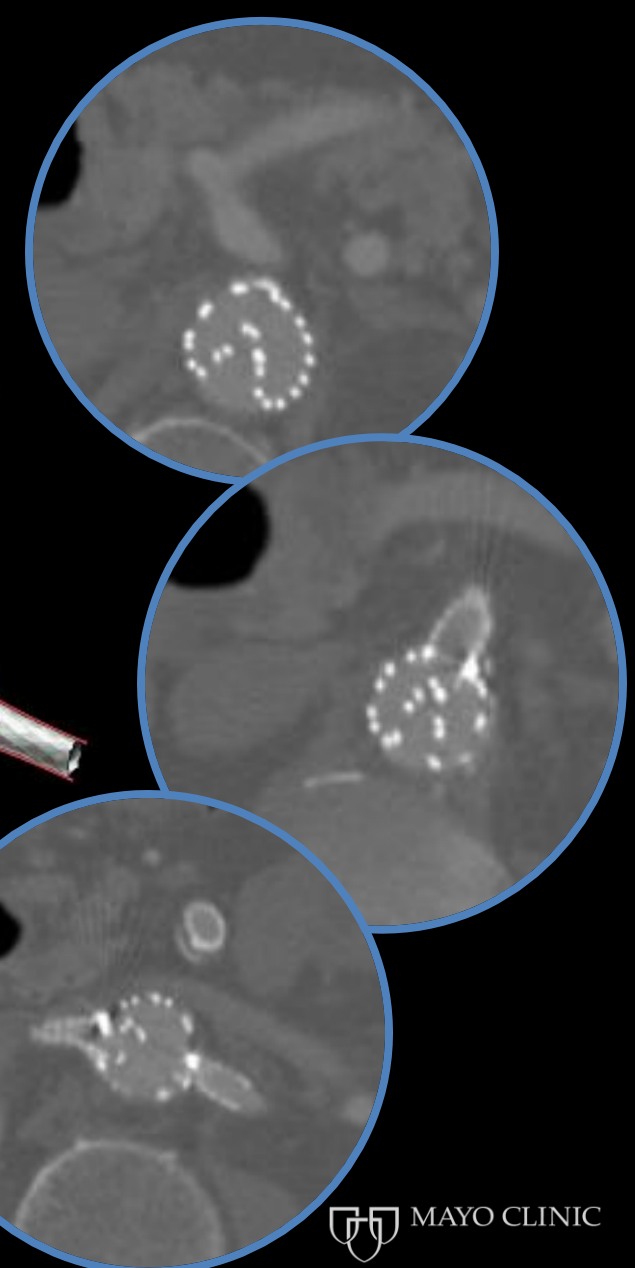
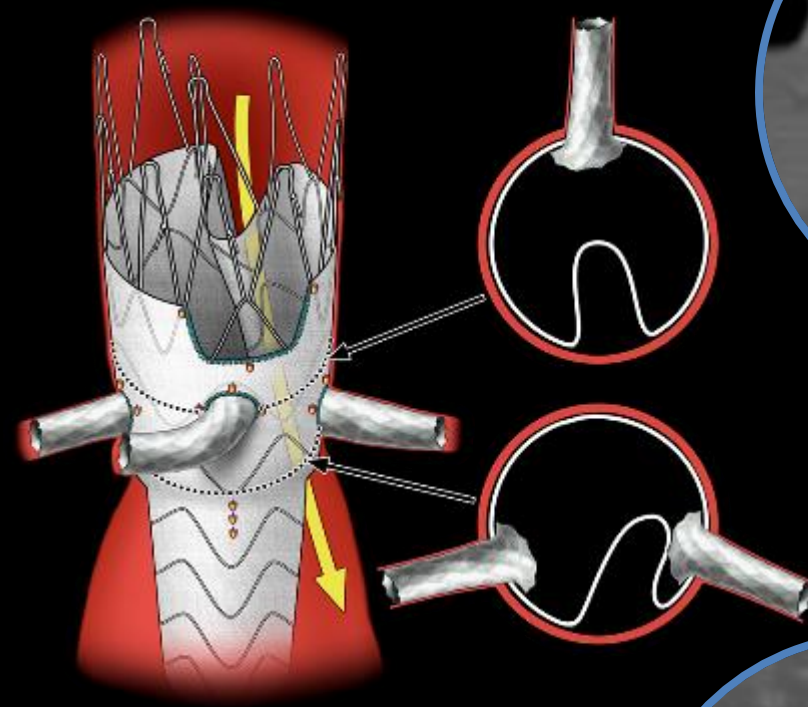


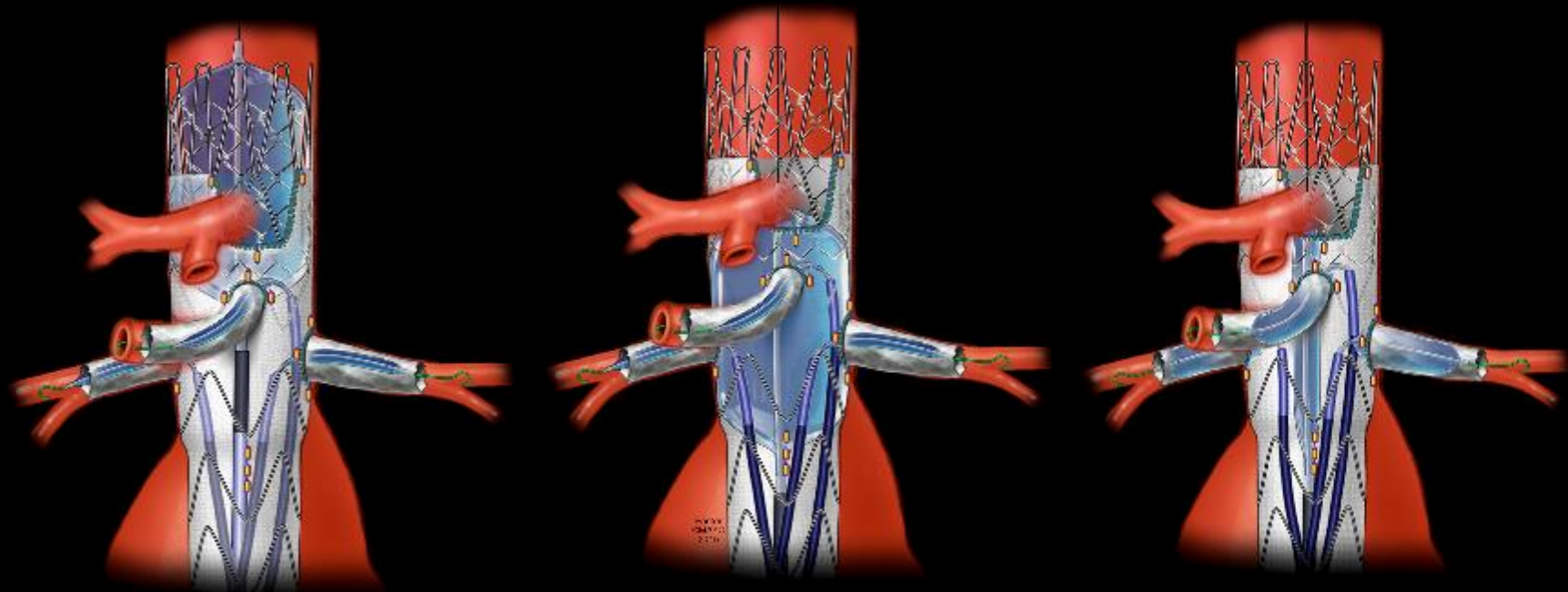
# TIP 10 IMMEDIATE ASSESSMENT

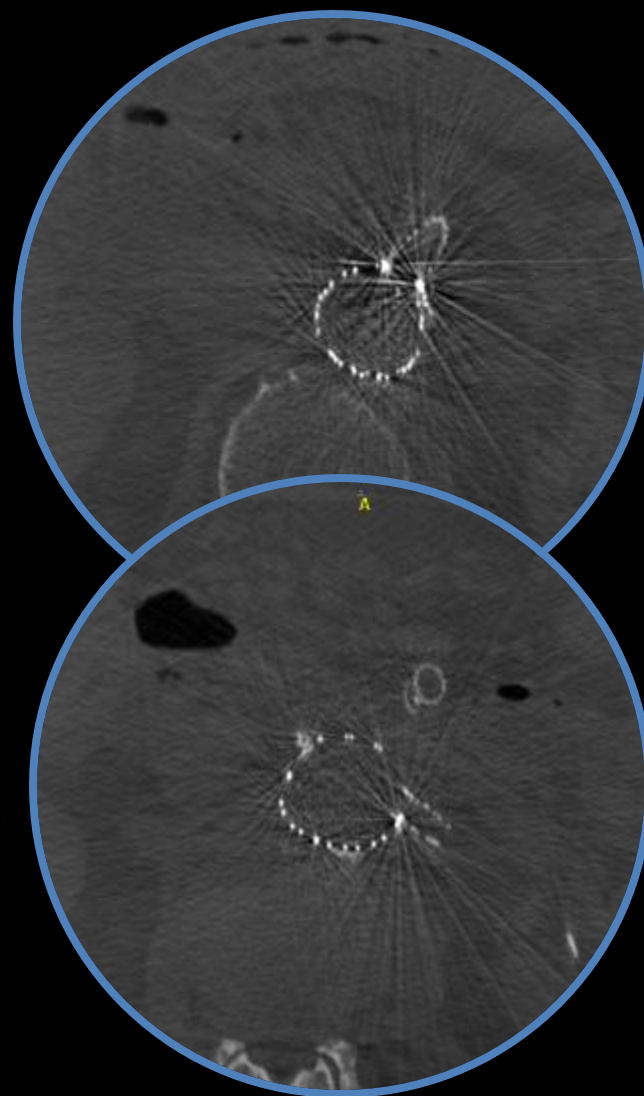
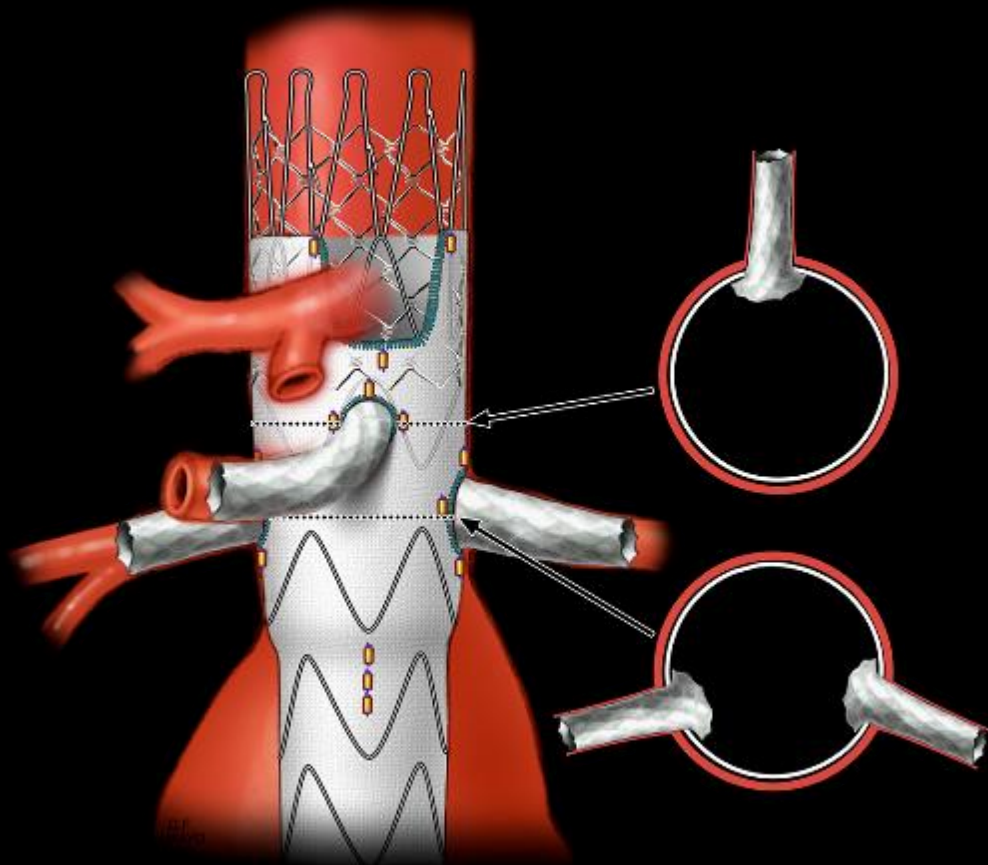
*High definition CT (GE Discovery)*











# TEN TIPS

1. Patient selection
2. Select proper landing zone
3. Design wisely (catheters, tapers, guides, etc)
4. Minimize contrast and radiation
5. } Know your “bail out” catheter skills
6. }
7. Avoid vessel injury
8. Avoid leg ischemia
9. Minimize blood loss
10. Immediately assess your result

MAYO CLINIC

150   
*Years*

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