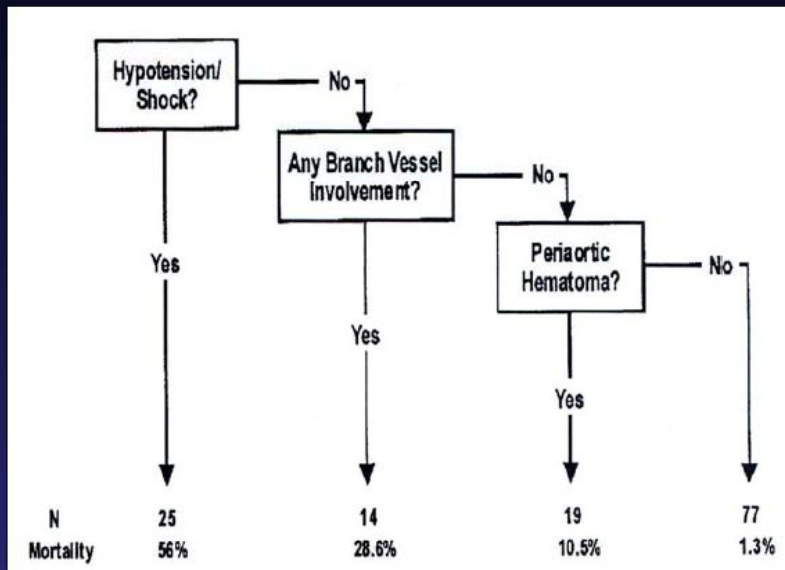
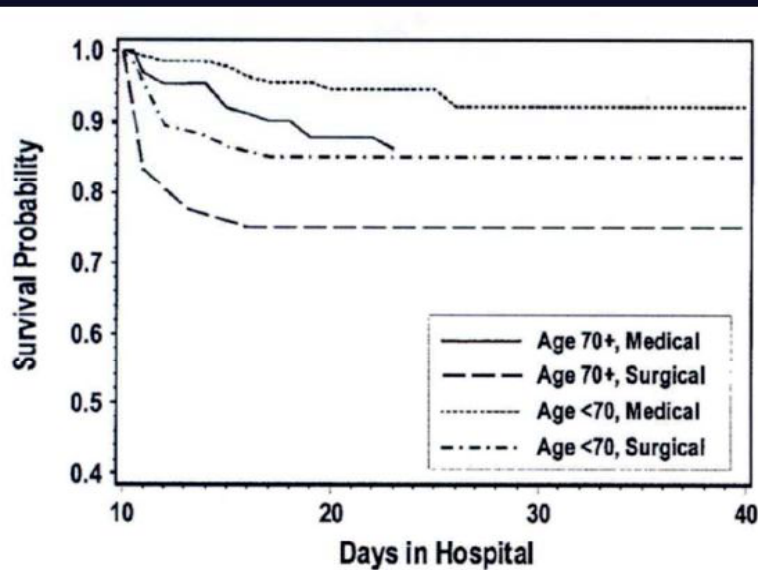




# **Endovascular Treatment of Malperfusion Syndrome in Type B Aortic Dissection**

**Department of Cardiology,  
Pusan National University Hospital,  
Han Cheol Lee**

## Classification tree for risk of in-hospital death in Type B Aortic Dissection



# Endovascular Treatment Indication of Type B Aortic Dissection



- Acute, Complicated AD
  1. Rupture
  2. Branch vessel ischemia  
(Carotid, Celiac, SMA, Renal, Distal aorta, CIA)
  
- Chronic, with Aneurysm formation

# Endovascular Treatment of Type B Aortic Dissection



- Aortic Stent Graft
- Selective Stenting
- Fenestration



# Endovascular Treatment of Type B Aortic Dissection : An IRAD Report



*N=571 acute type B*

	<u>Open Surgery</u>	<u>Endovascular</u>
n	59 (11.5%)	66 (12.8%)
CVA	4 (9.1%)	2 (3.4%)
Coma	2 (4.5%)	1 (1.7%)
Spinal cord isch	3 (6.8%)	2 (3.4%)
Myocard isch	1 (2.6%)	1 (1.7%)
Acute renal fail	8 (19.0%)	4 (6.9%)
Mes isch/infarc	2 (5.0%)	4 (6.9%)
Limb isch	2 (5.0%)	2 (3.4%)
Any of above compl	16 (40.0%)	11 (20.8%)
<b>Mortality</b>	<b>20 (33.0%)</b>	<b>7 (10.6%)</b>

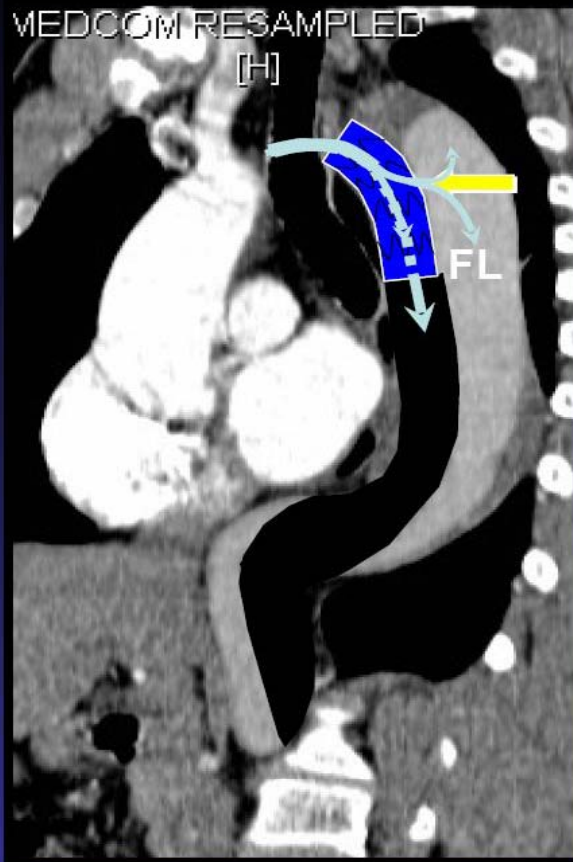
# Endovascular Treatment of Malperfusion in Acute Type B Aortic Dissection

- 69 Patients with acute type B dissection with malperfusion were treated with a combination of flap fenestration, true lumen, or branch vessel stenting
- Malperfusion vessels: spinal cord (n=5), mesenteric (n=40), renal (n=51), and lower extremity (n=47)
- Major morbidity: dialysis need (n=11), stroke (n=3), Paralysis (n=2)
- 30-Day mortality 17.4% (n=12)
- Mean survival 84 months
- Freedom from aortic rupture or open repair at 1, 5, and 8 years was 80%, 67% and 54%

*Patel HJ, et al. J Thorac Cardiovasc Surg 2009;138(2):300-8*

# Endovascular Treatment of Malperfusion : Aortic Stent Graft

## Concept of Endovascular Repair in AD



- Closure of the proximal entry tear
- Depressurization of the false lumen
- Thrombosis of FL
- Redirection of blood flow towards TL
- Induction of „aortic remodeling“

# INSTEAD Trial : *Nienaber CA et al. : Circulation.* 2009;2519-2528.



Table 1. Outcomes at 2 Years

	Medical Therapy Alone (n = 68)	TEVAR (n = 72)	P Value
Survival	95.6 ± 2.5%	88.9 ± 3.7%	0.15
Freedom from Aorta-Related Mortality	97.0 ± 2.0%	94.4 ± 2.7%	0.44
Freedom from Progressive Aortic Disease	72.5 ± 5.5%	77.2 ± 5.0%	0.65

Table 2. Cumulative Events at 2 Years

	Medical Therapy Alone (n = 68)	TEVAR (n = 72)	P Value
Secondary Interventions	22.1%	18.1%	0.74
<b>Adverse Events</b>			
Persistent Paraplegia/ Paraperesis	1.4%	2.8%	0.90
Major Stroke	0	2.8%	0.53

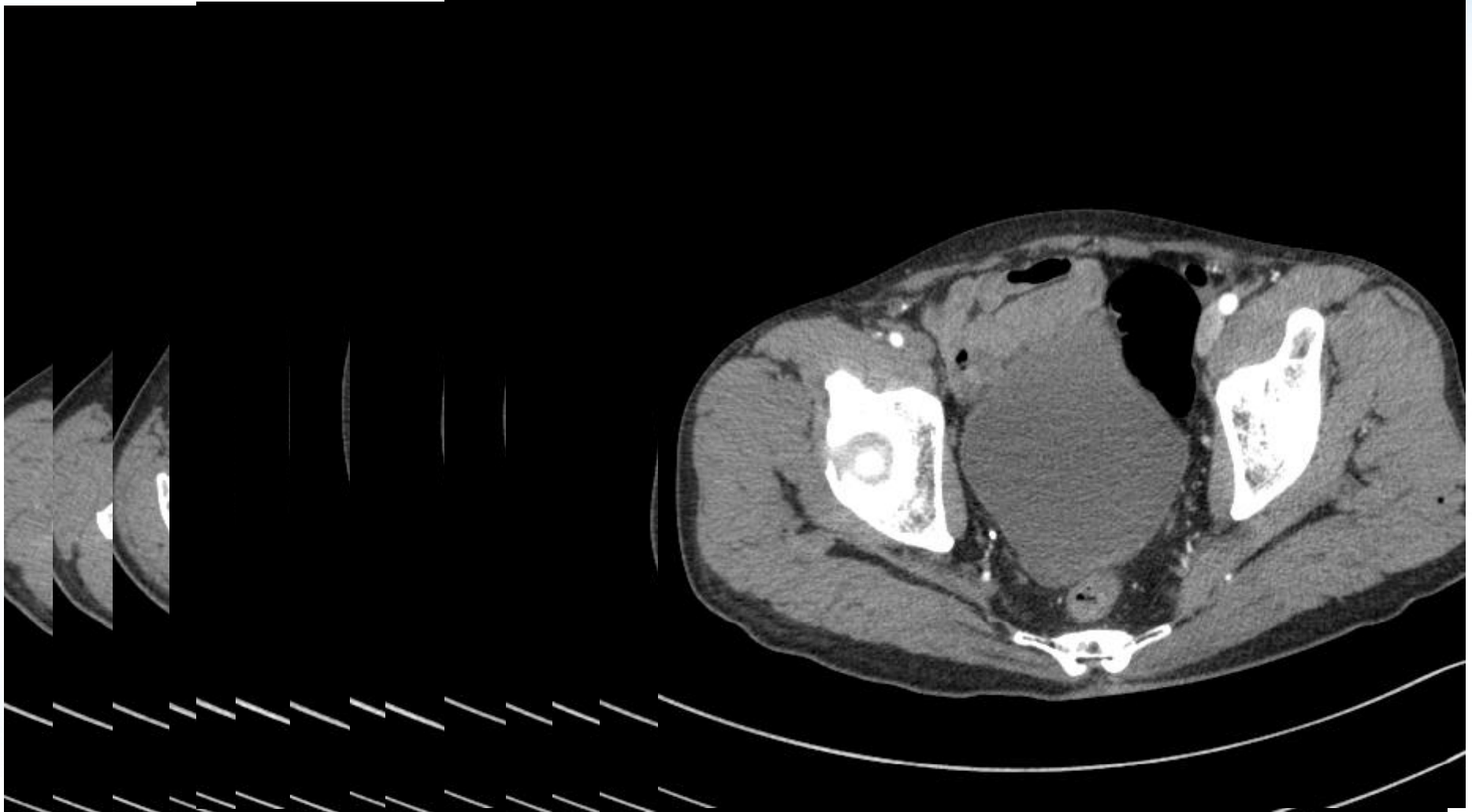


# Endovascular Treatment of Malperfusion : Aortic Stent Graft Case

변O M/58

- Chief Complaint : back pain, left chest pain, right leg pain  
Symptom onset 3 days ago
- Past History : HT(+), DM(+)  
Hyperlipidemia(-), CVA(-)
- Social History : Smoking (+)
- ABI : 0.2 / 0.9
- Hb : 9.8

CT



# CT





# Assessment

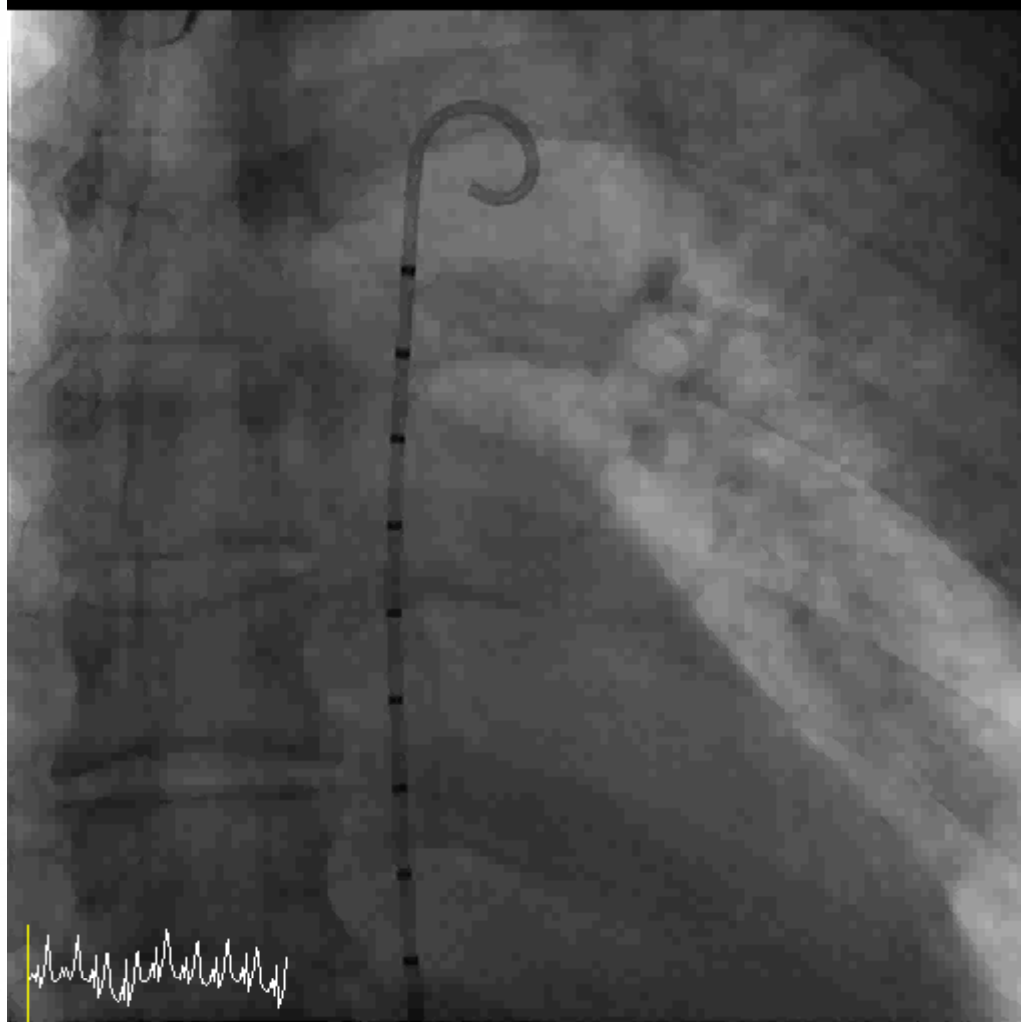


1. Aortic Dissection with Malperfusion syndrome

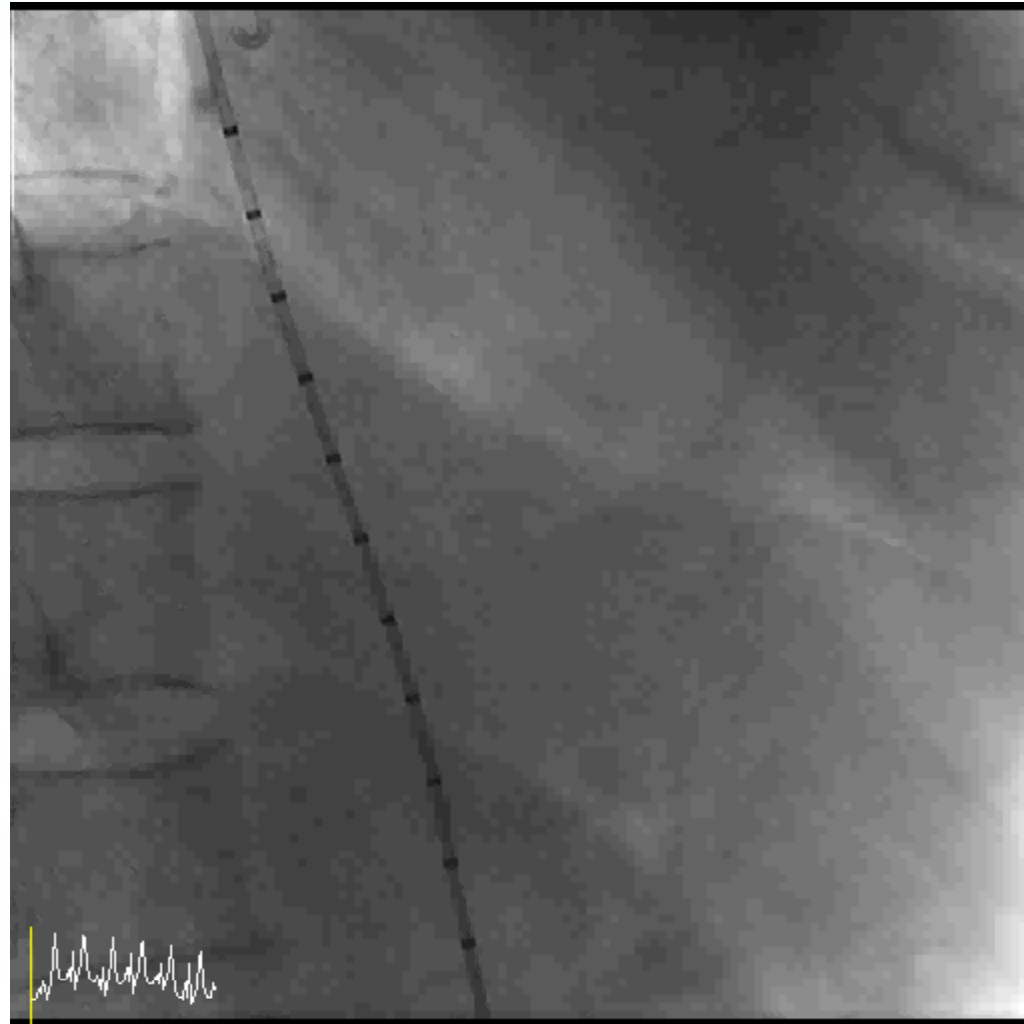
## Plan ?

1. Aortic stent graft
2. Fenestration
3. Femoral – femoral bypass operation

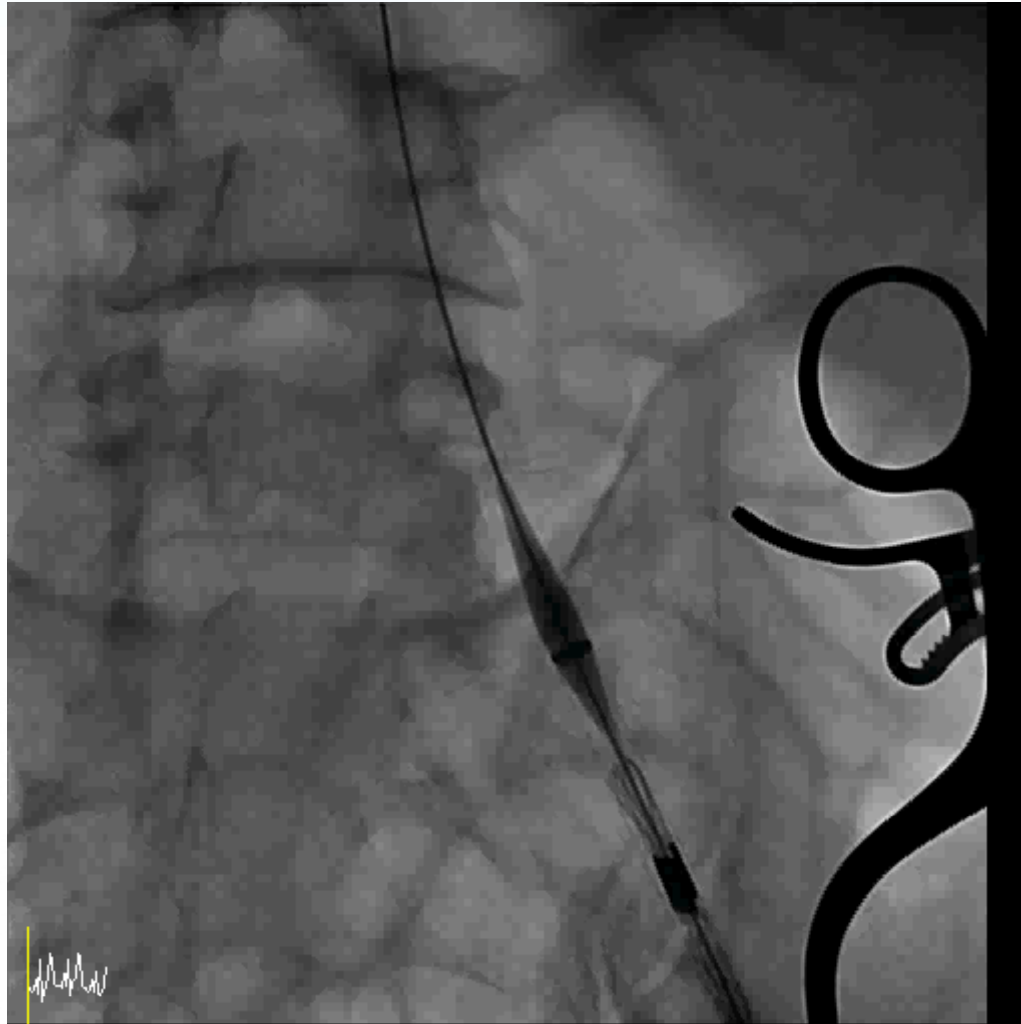
# Aortic Stent Graft



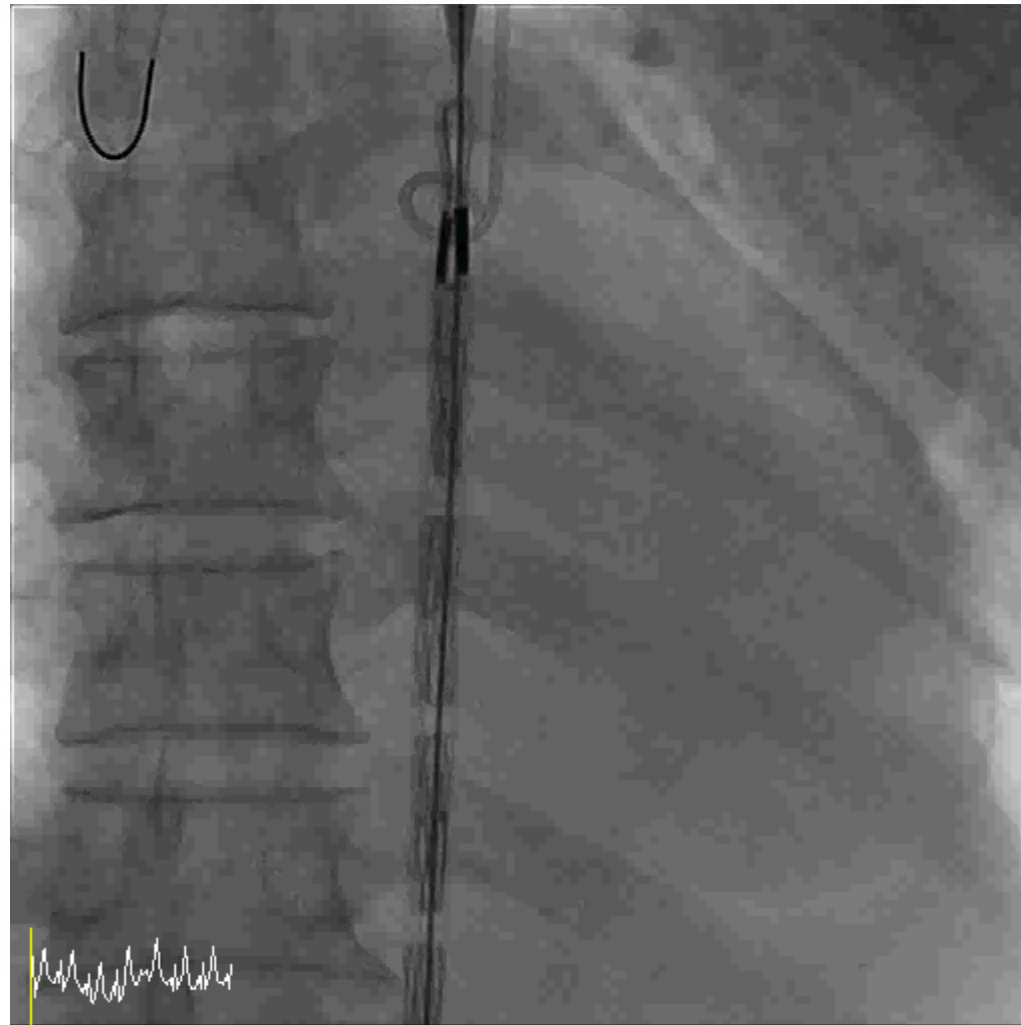
# Aortic Stent Graft



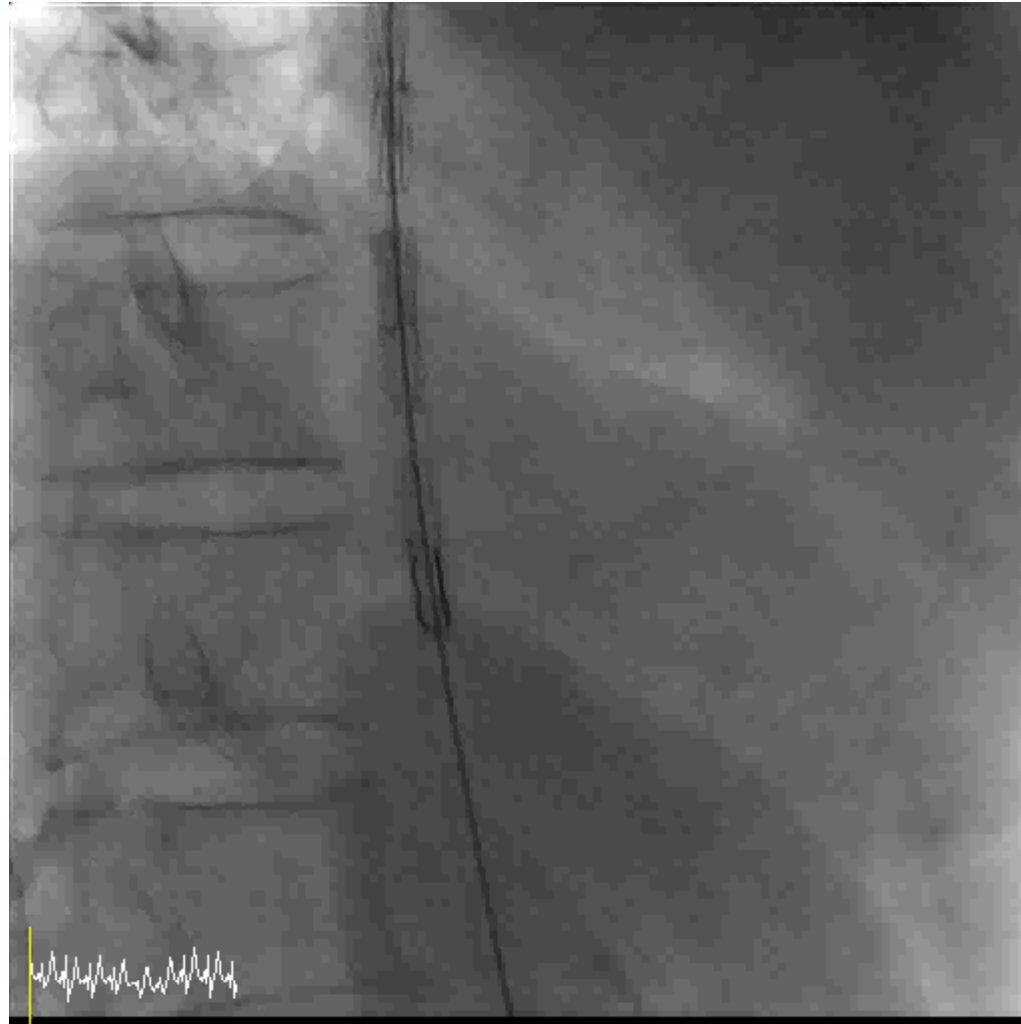
# Aortic Stent Graft



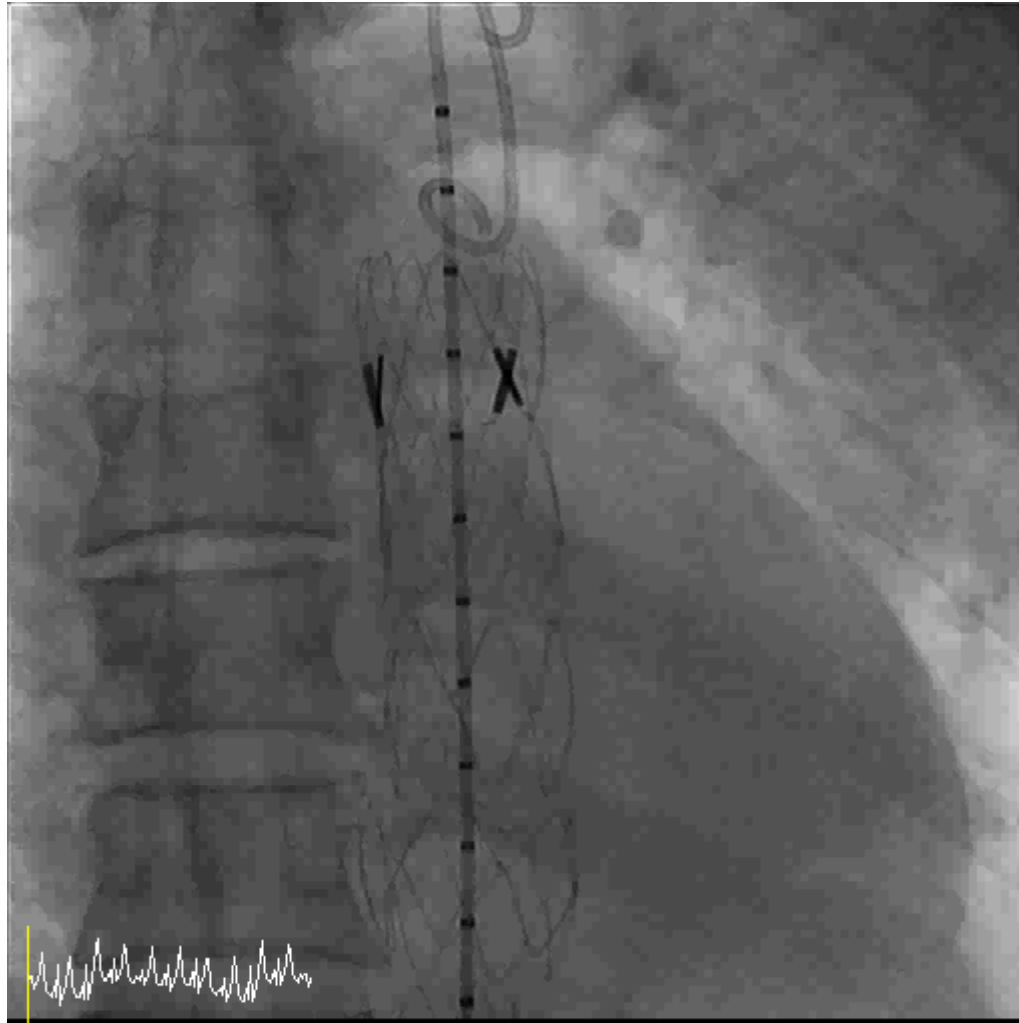
# Aortic Stent Graft



# Aortic Stent Graft

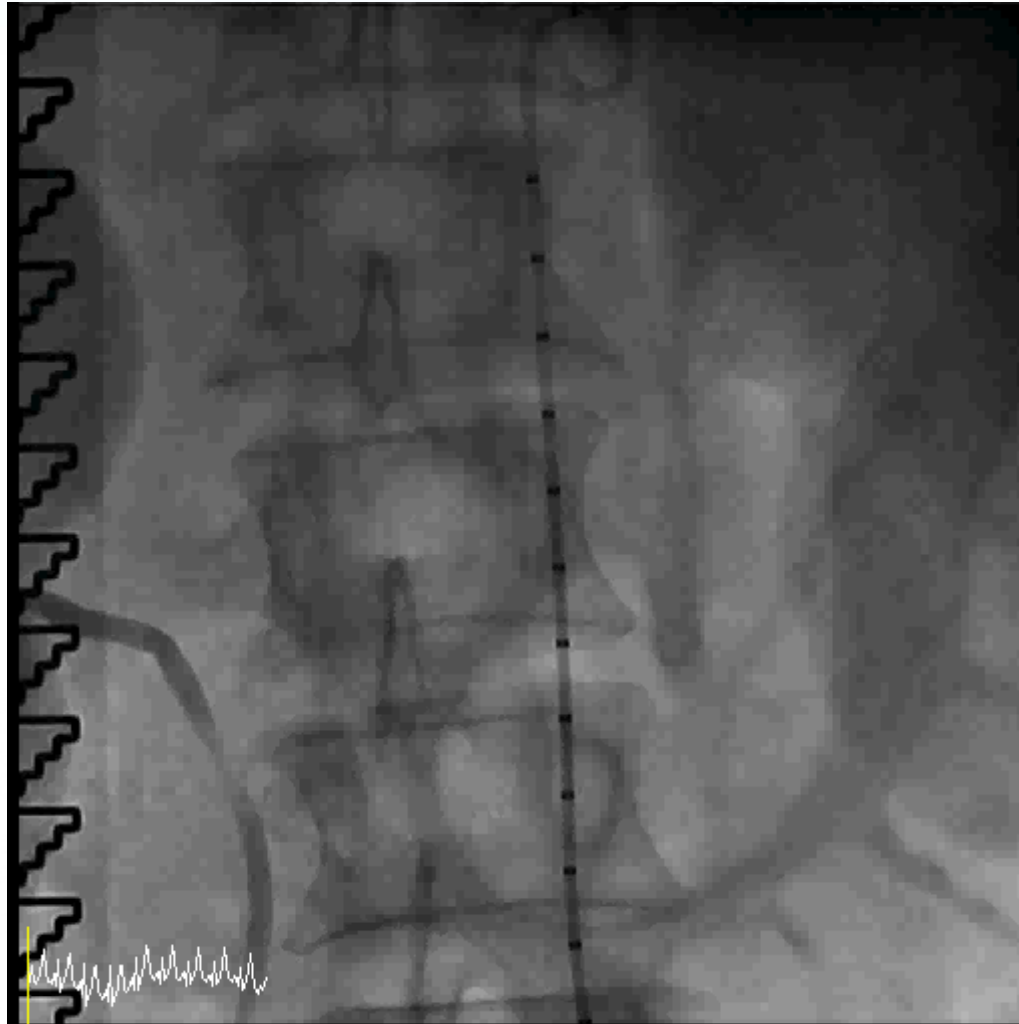


# Aortic Stent Graft

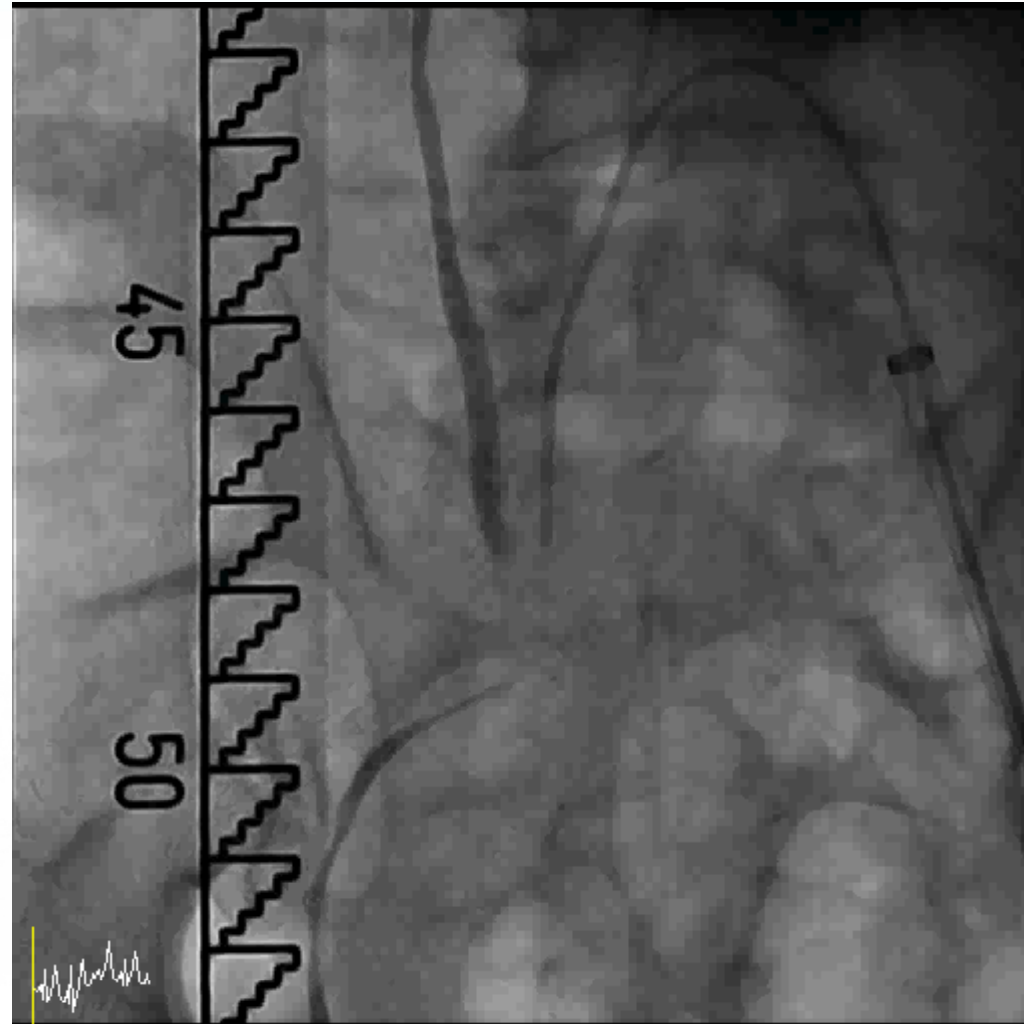




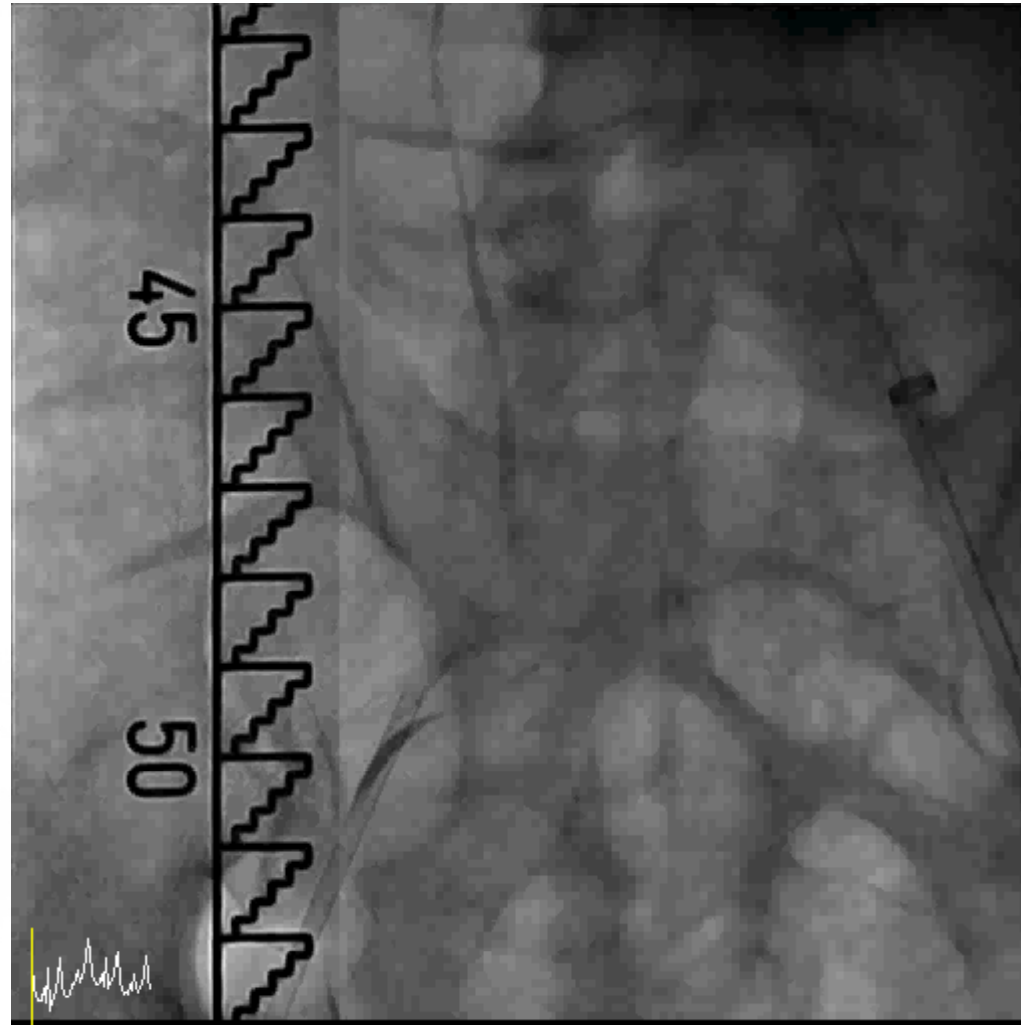
# Aortic Stent Graft



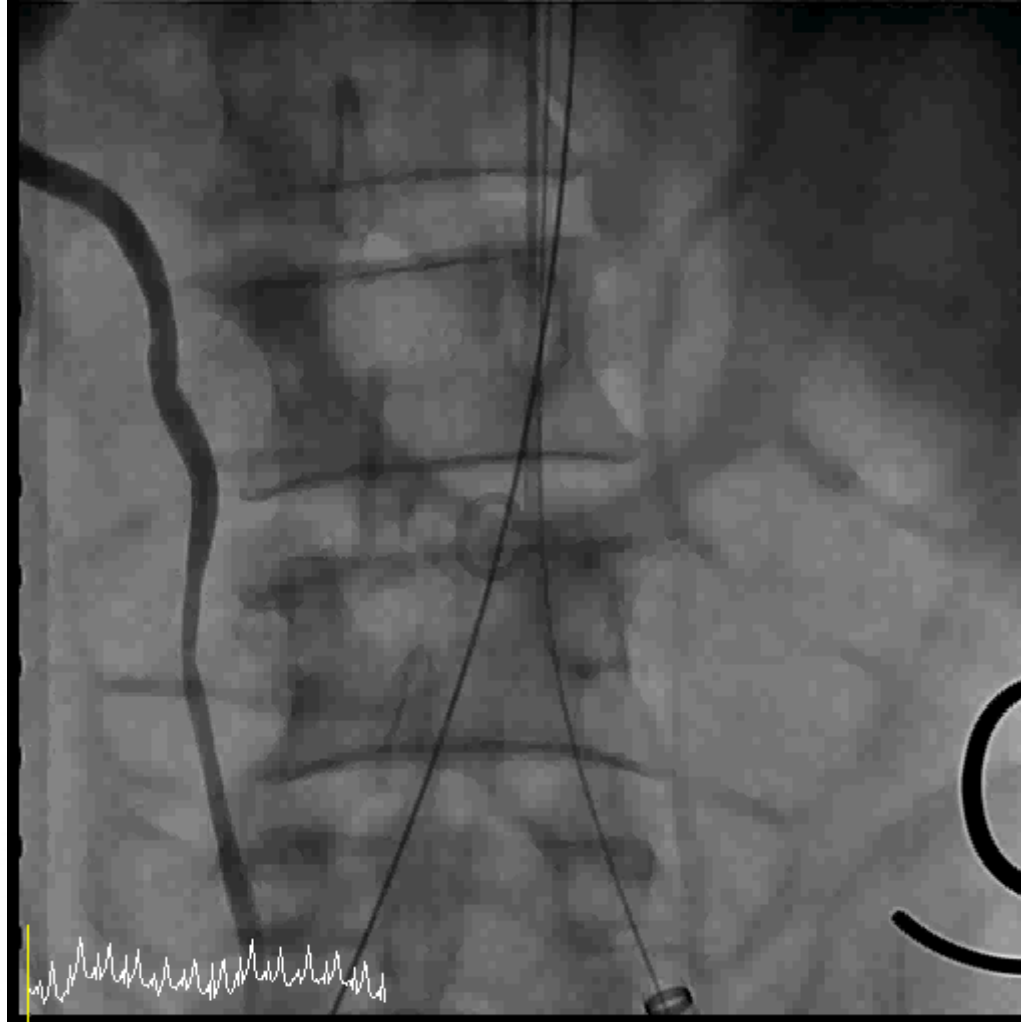
# Aortic Stent Graft



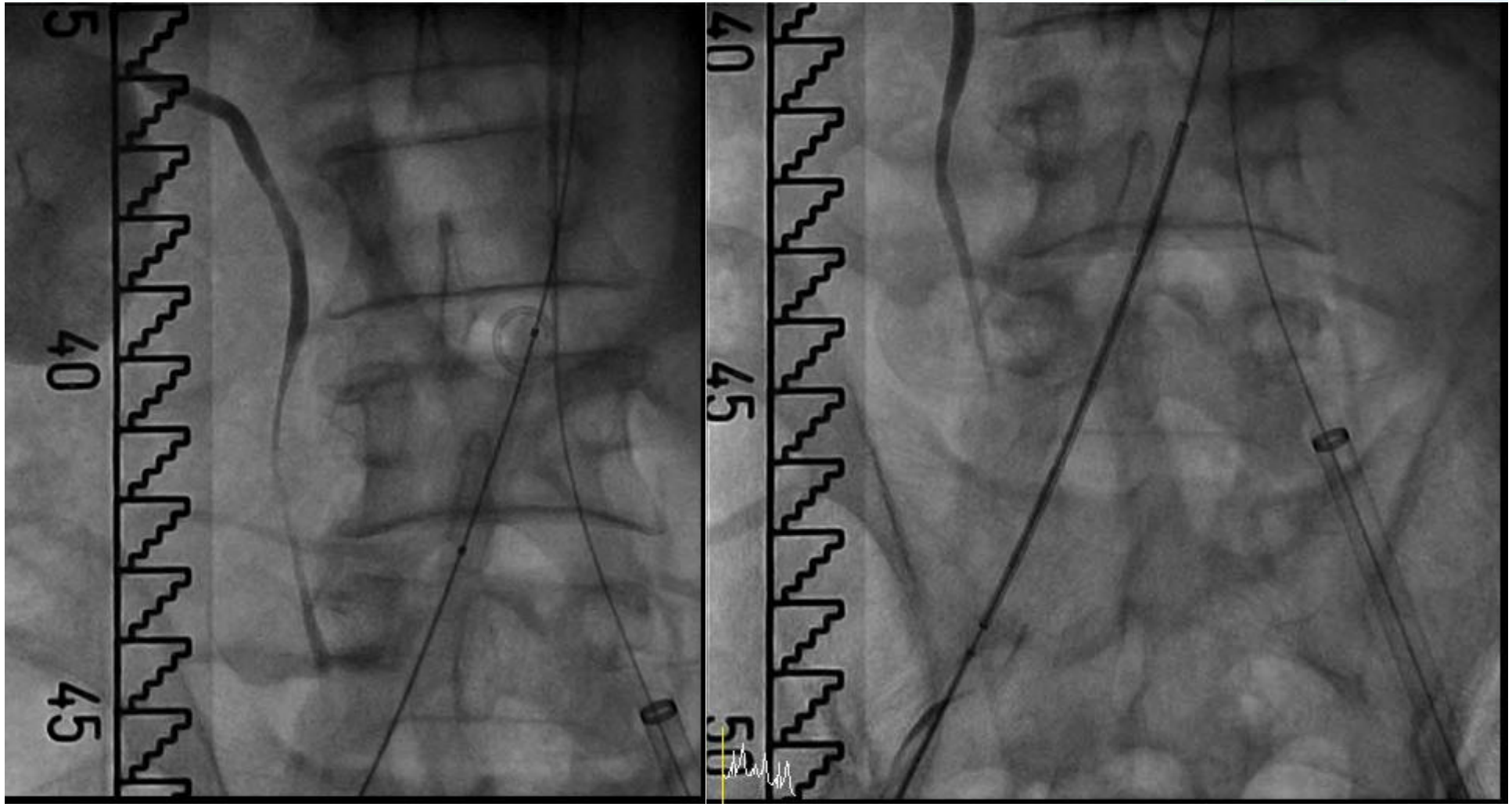
# Aortic Stent Graft



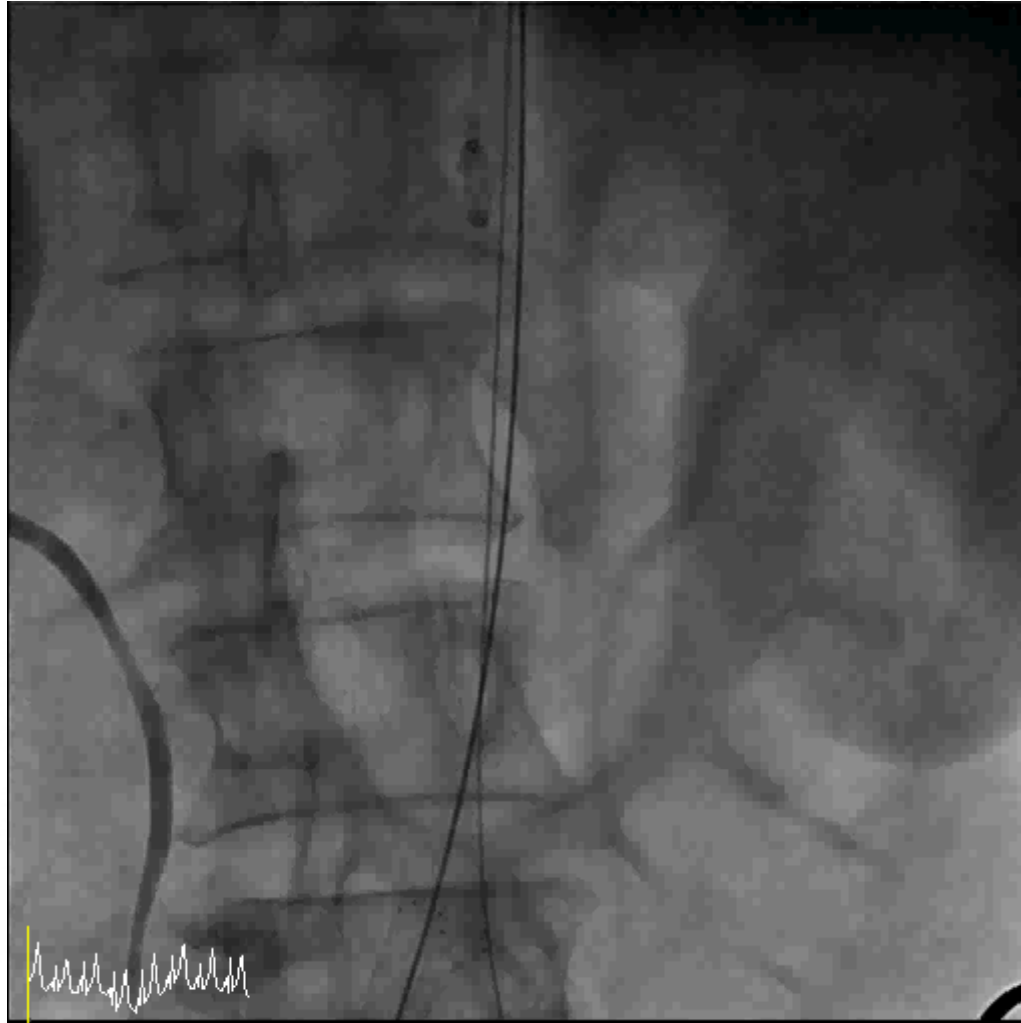
# Aortic Stent Graft



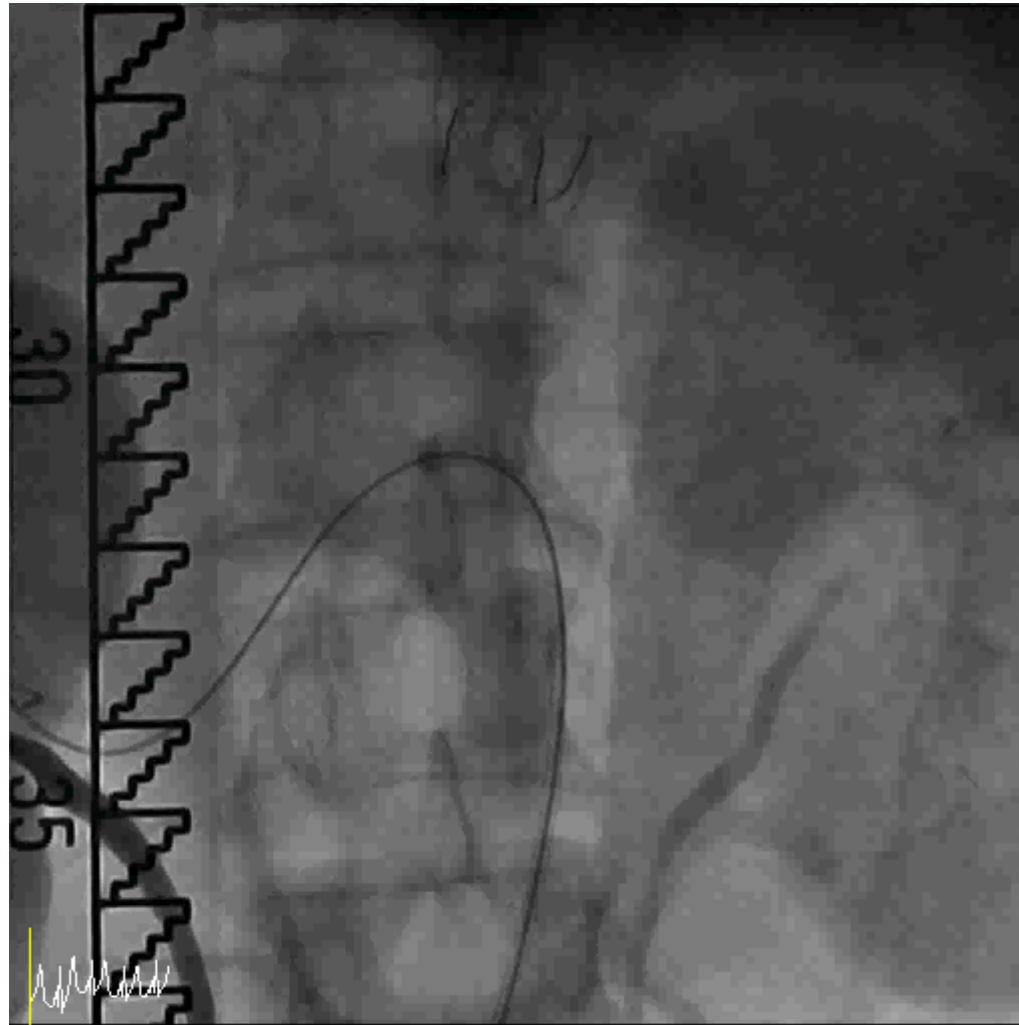
# Aortic Stent Graft



# Aortic Stent Graft

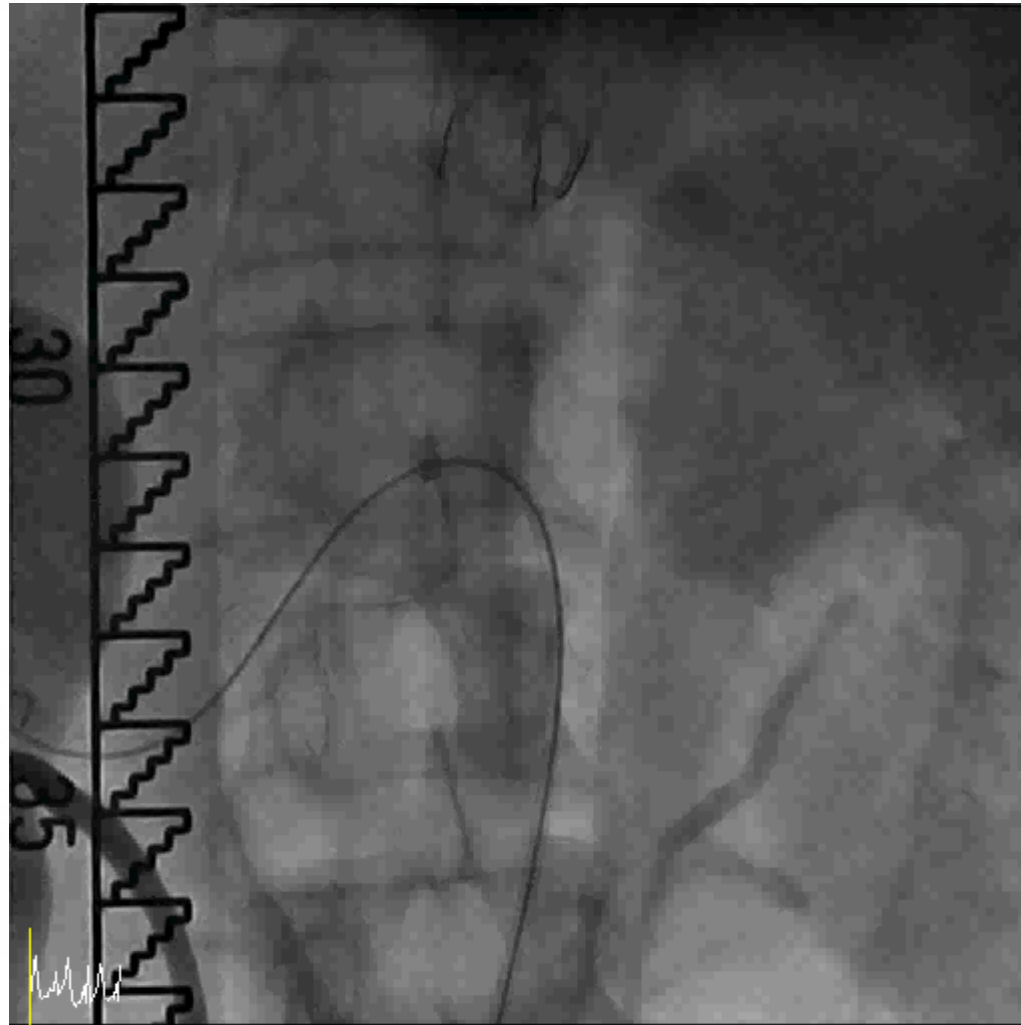


# Aortic Stent Graft

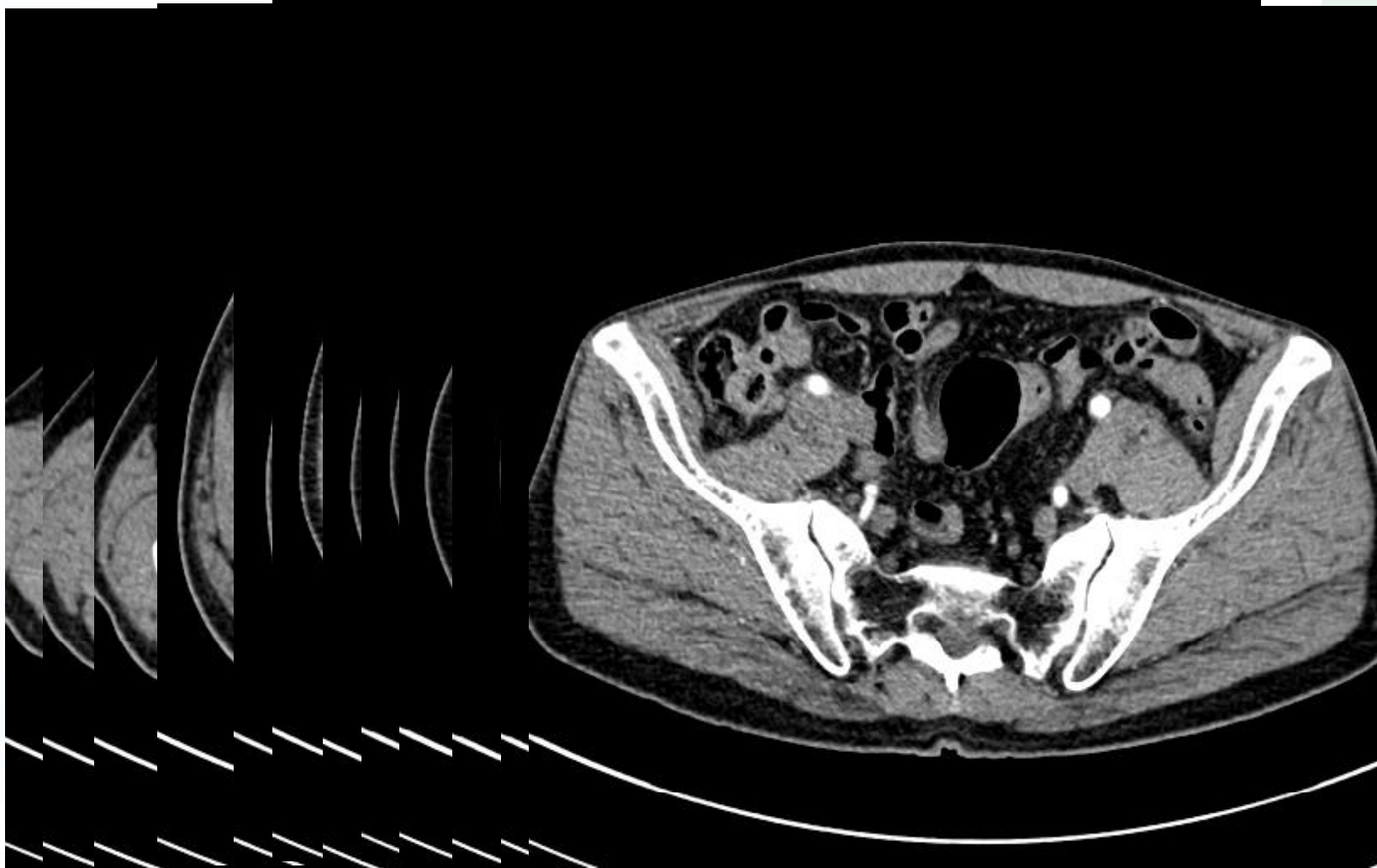




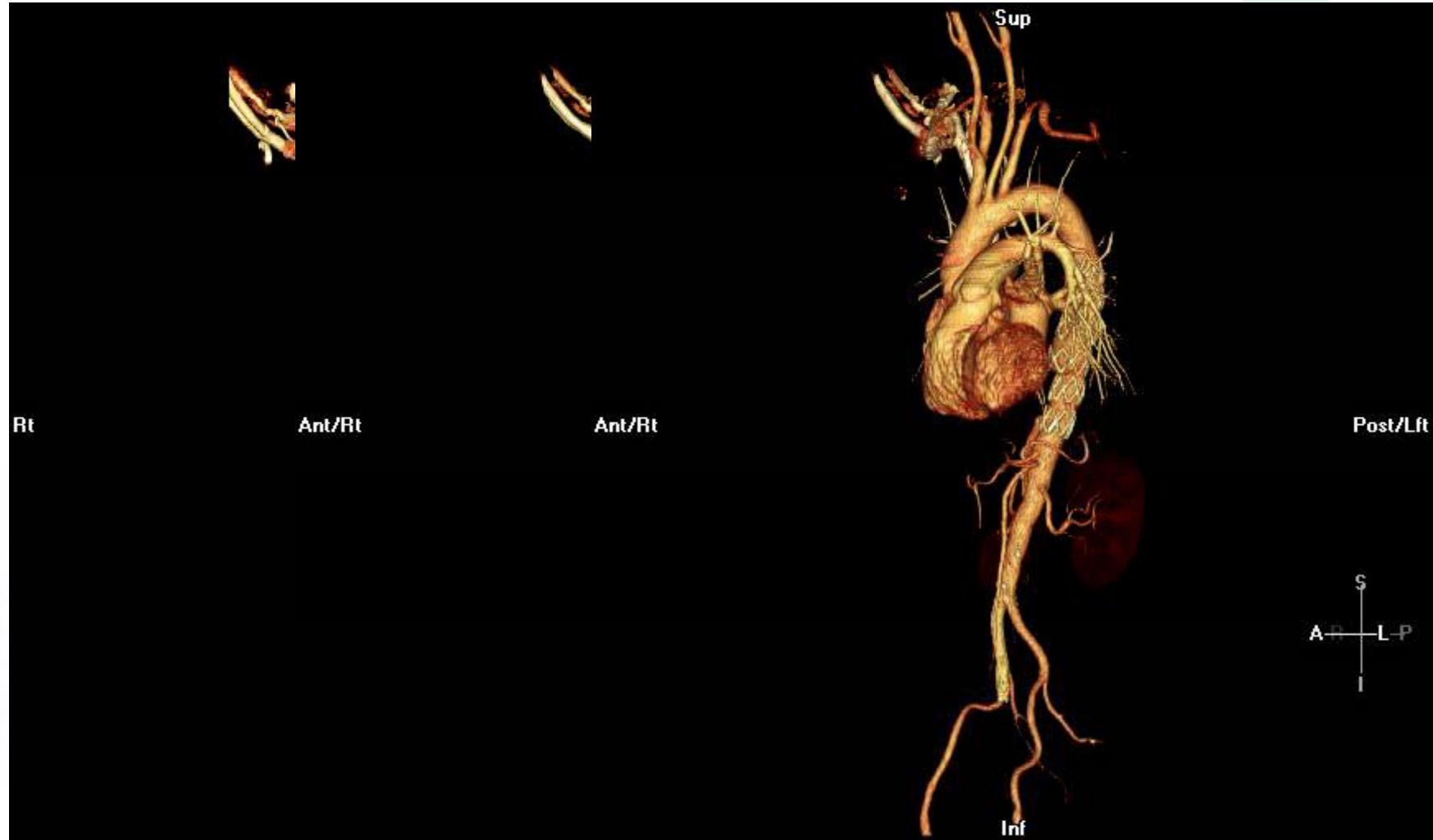
# Aortic Stent Graft



# Follow up CT after 1 year

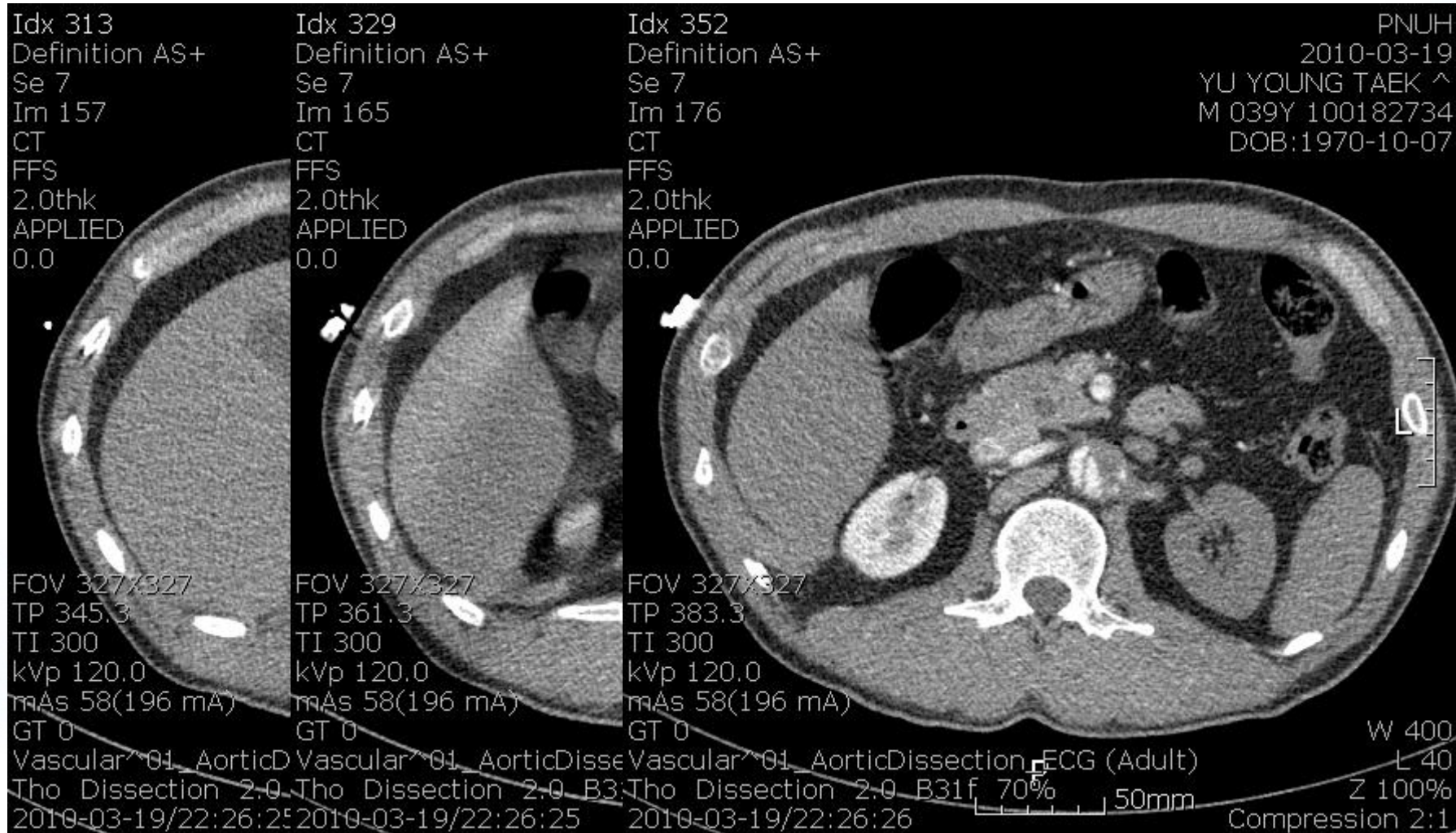


# Follow up CT after 1 year



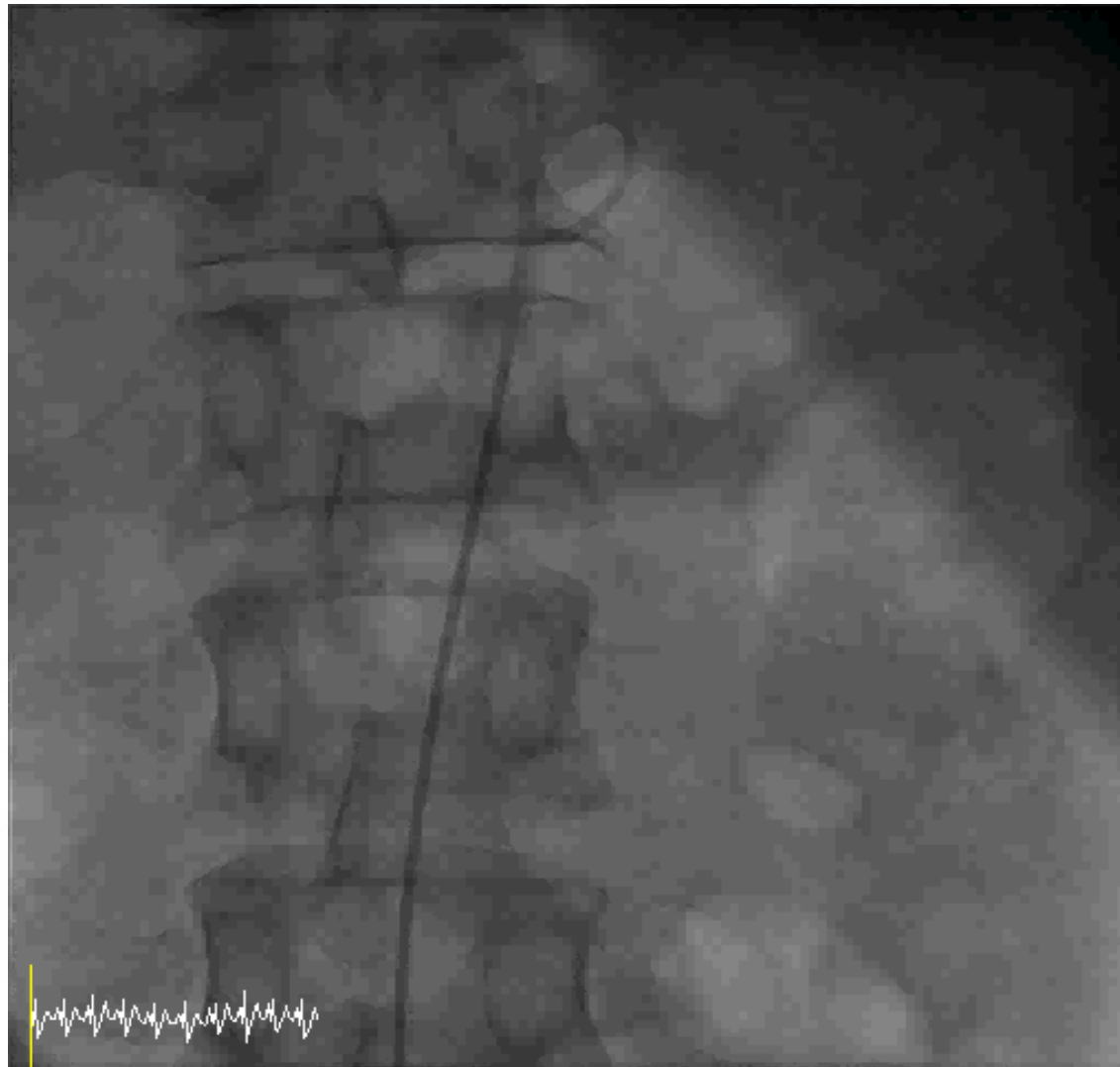
# Endovascular Treatment of Malperfusion

## : Selective Stents Cases 유 O (M/39)

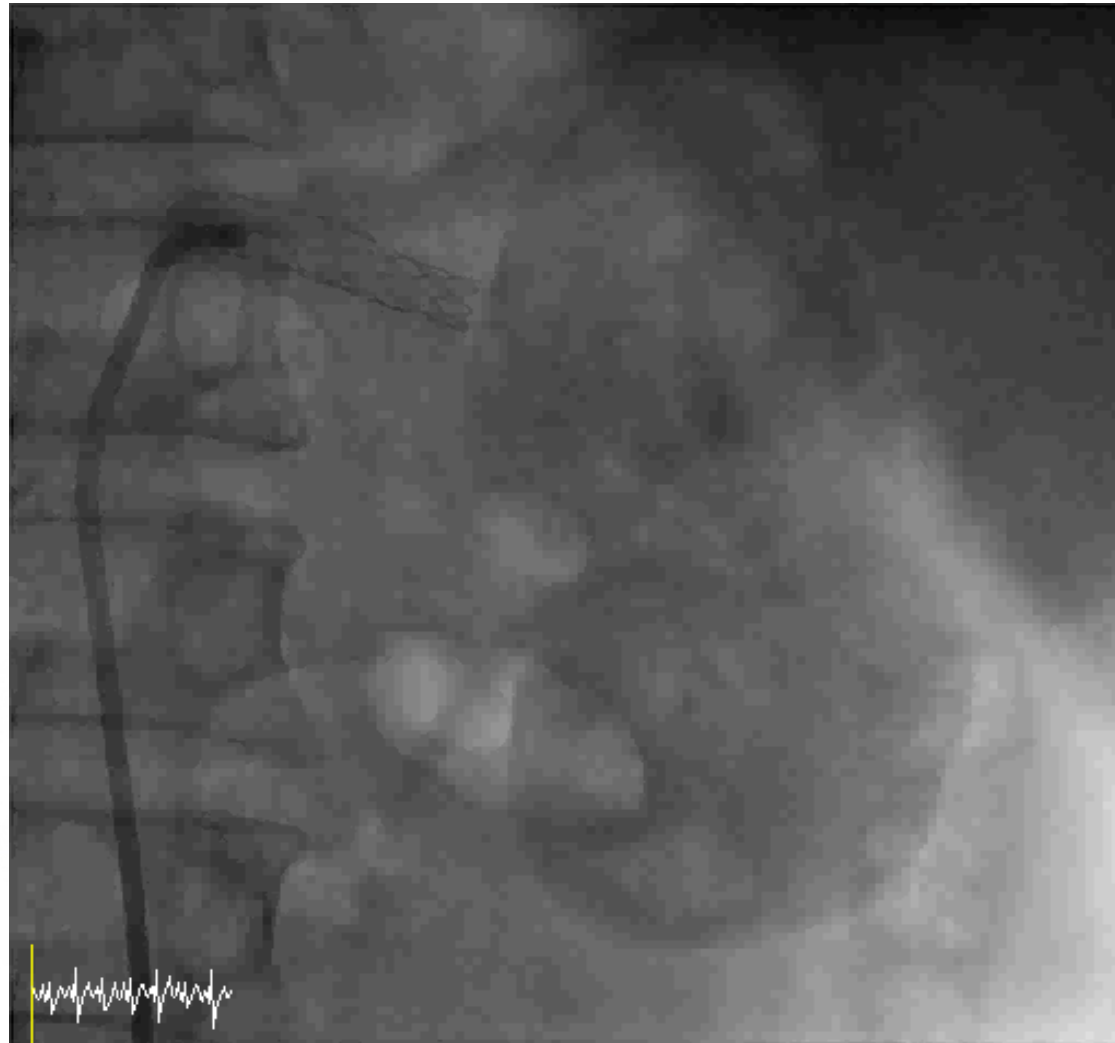




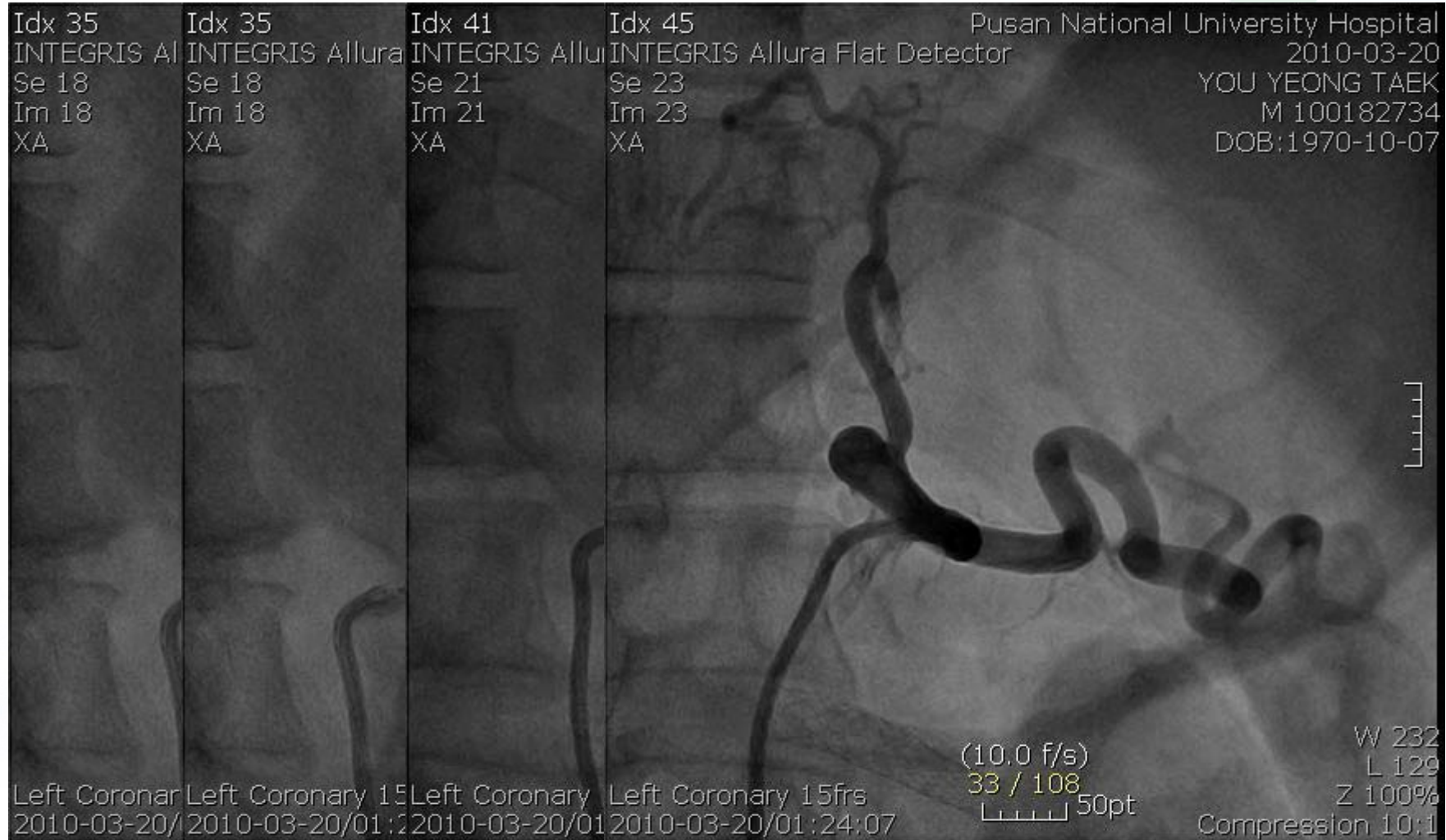
# Endovascular Treatment of Malperfusion : Selective Stents Cases



# Endovascular Treatment of Malperfusion : Selective Stents Cases

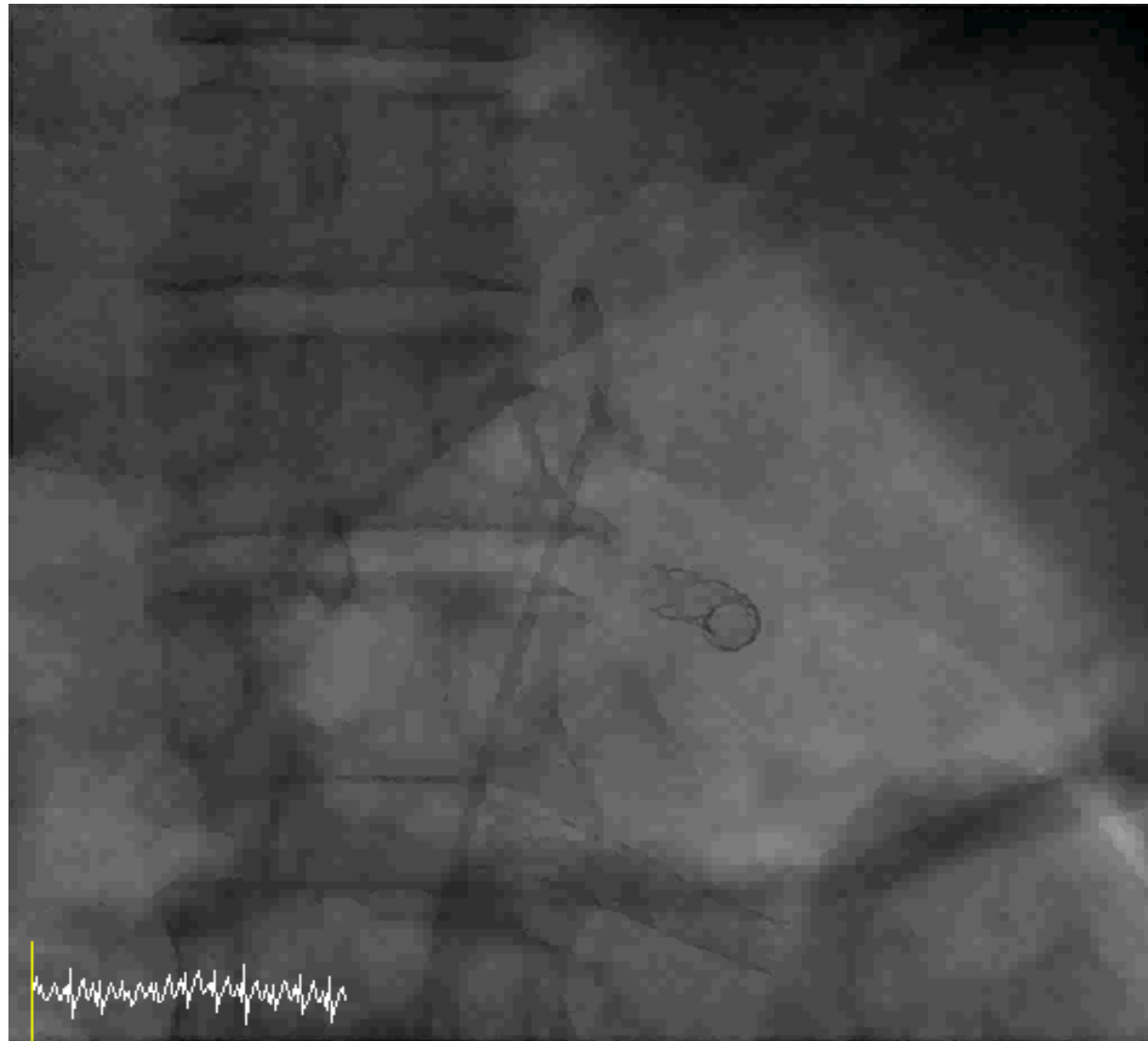


# Endovascular Treatment of Malperfusion : Selective Stents Cases





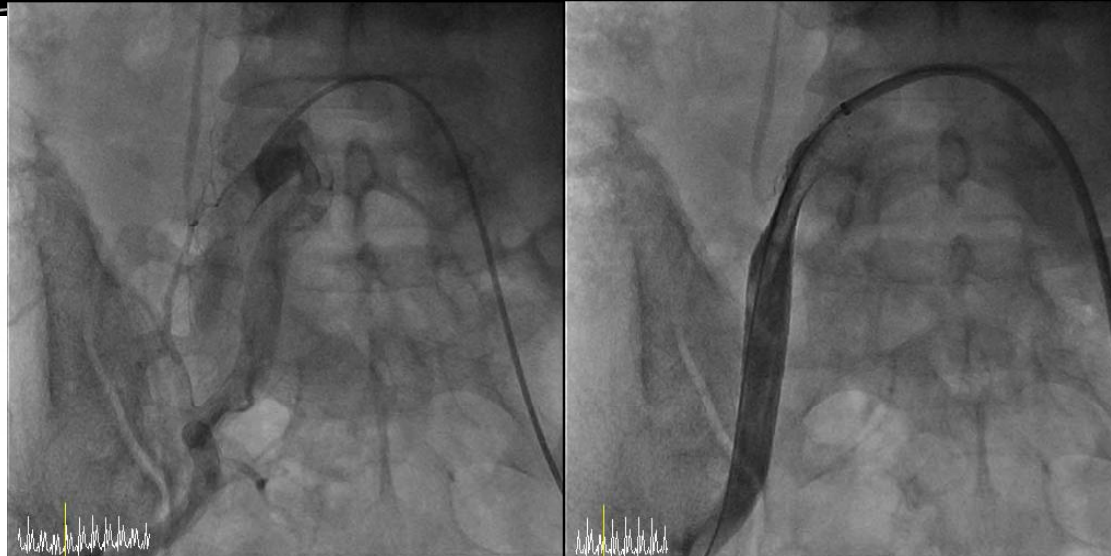
# Endovascular Treatment of Malperfusion : Selective Stents Cases



# Endovascular Treatment of Malperfusion : Selecive Stents Cases



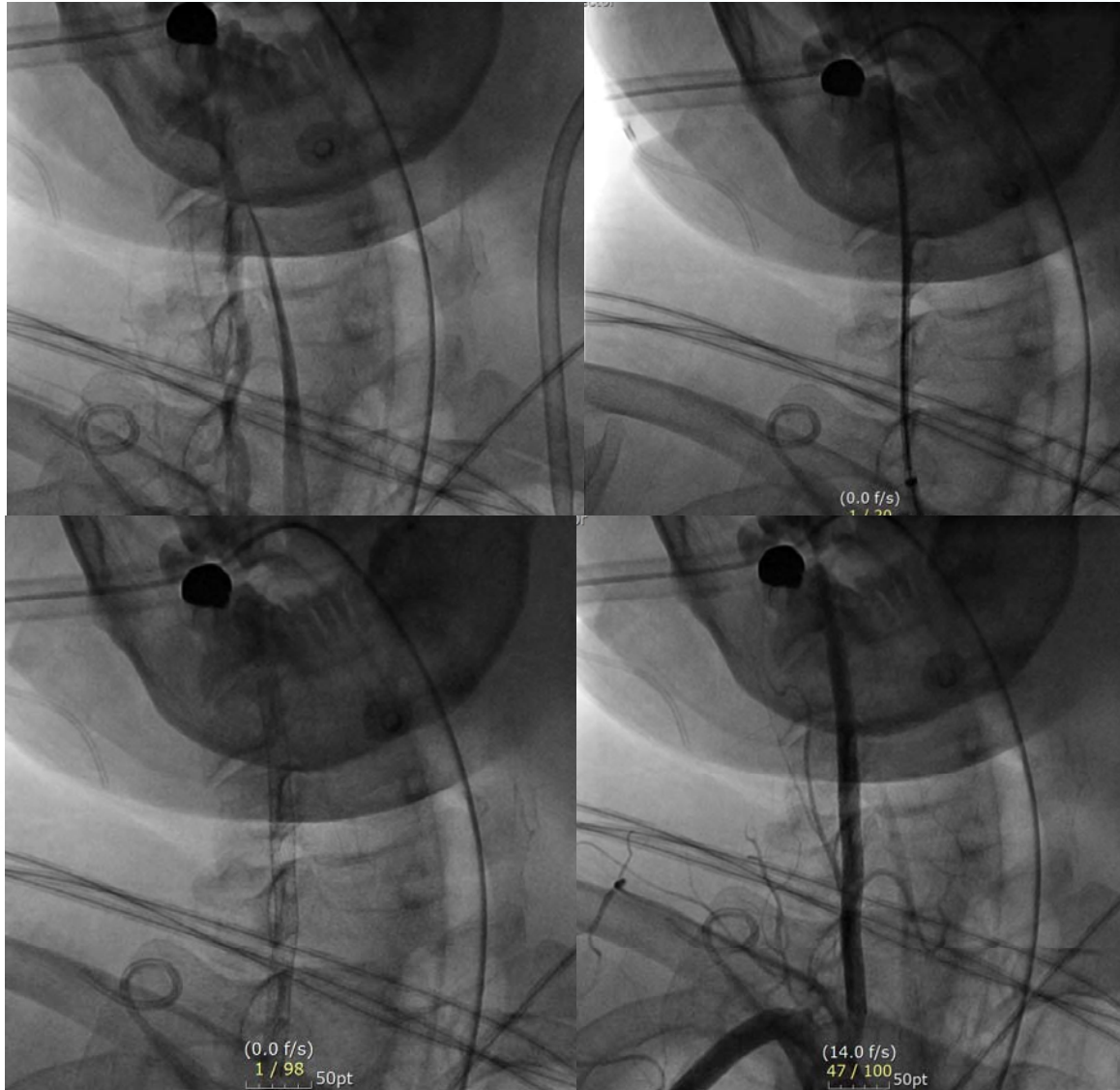
# Malperfusion : Common Iliac Artery



M/46

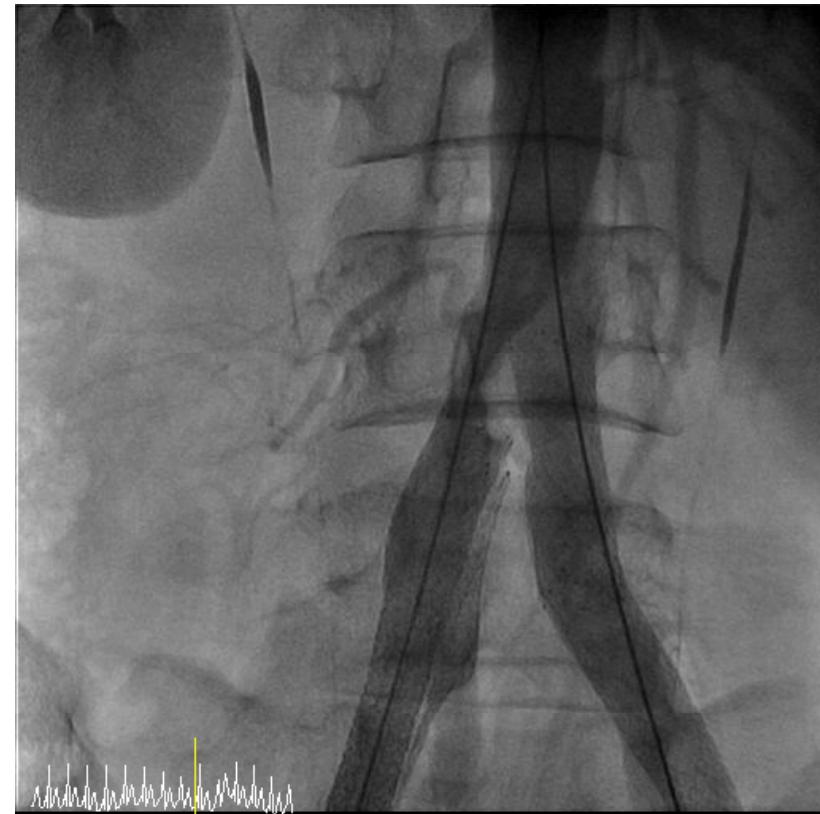
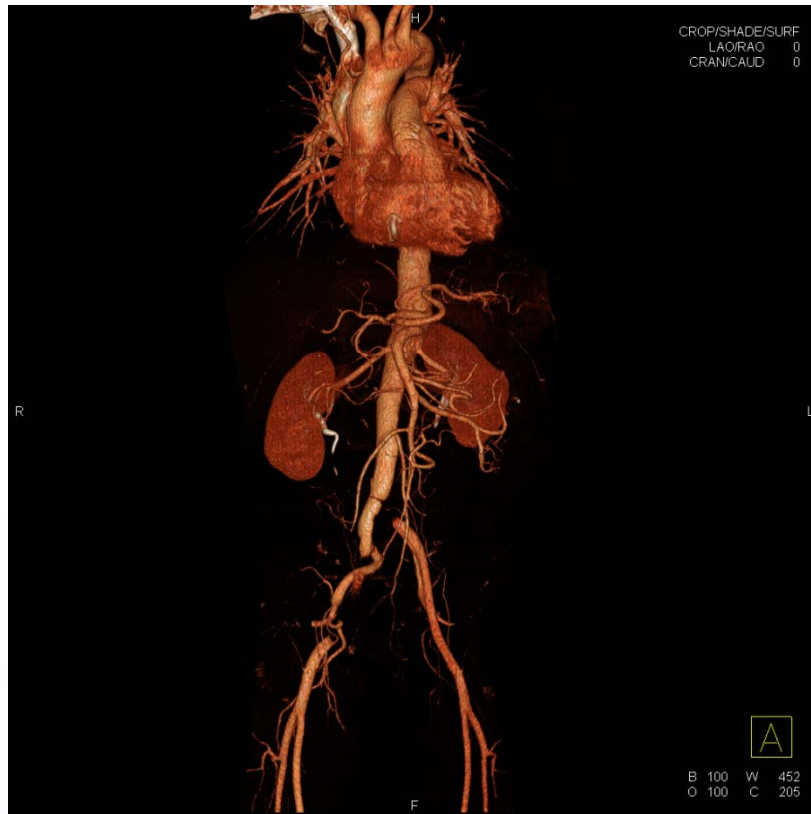


# Malperfusion : Left Carotid Artery

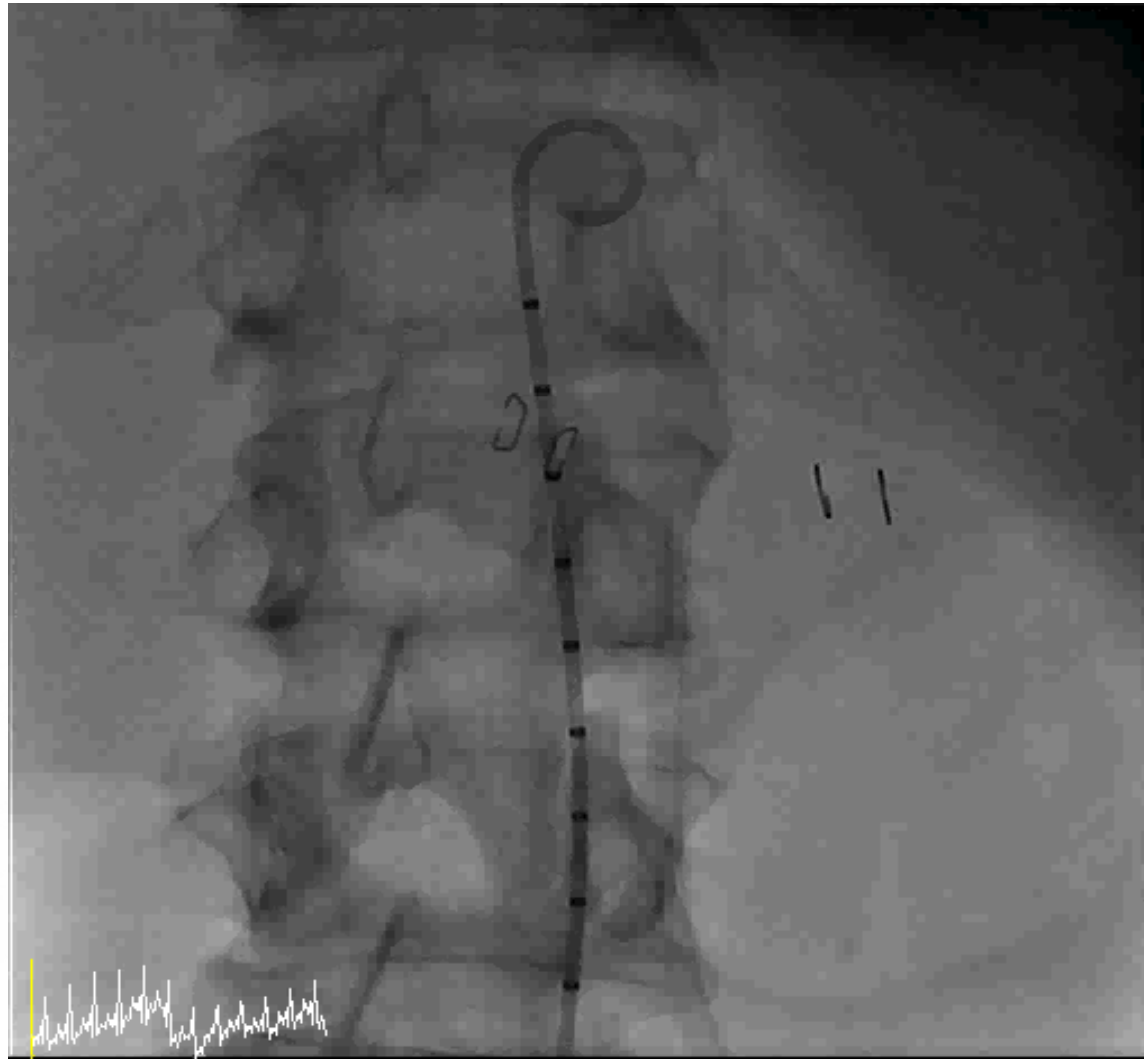


M/50

# Malperfusion : Distal aorta, both CIA



# Endovascular Treatment of Malperfusion : Fenestration Cases



# Endovascular Treatment of Malperfusion : Fenestration Cases





## Midterm results of endovascular treatment in patients with complicated type B Aortic Dissection : Data of PNUH

- AD managed with endovascular treatment : 17 patients 2005-2010
- Mean follow up duration :  $19.3 \pm 11.2$  months.
- 12 cases of Acute aortic dissection
  - 5 cases of Chronic aortic dissection with huge aneurysm
- 8 cases of malperfusion syndrome
- 4 cases of aortic stent grafting for ruptured aortic dissection.
- **Mortality of complicated AD** managed with endovascular treatment showed **11.8%(2/17)**.
- **Rate of reintervention was 11.8%(2/17)**. 2 cases of chronic aortic dissection with huge aneurysm formation were relapsed aortic dissection in the distal part of aortic stent graft which were managed with additional stent graft.

## Midterm results of endovascular treatment in patients with complicated type B AD and malperfusion syndrome : Data of PNUH

- 8 cases of malperfusion syndrome
- Treated with
  - Aortic stent graft(n=3),
  - Selective branch artery stenting(n=7)
    - renal 4, celiac 3 carotid 1 common iliac 2
  - Fenestration(n=1),
  - Combined procedure(n=4).
- **Mortality of malperfusion syndrome** managed with endovascular treatment was **12.5%(1/8)**.
- **1 case of in-hospital mortality.**
- The causes of death was hepatic failure because of compromised celiac trunk.

**Midterm results of endovascular treatment in patients with complicated type B AD and malperfusion syndrome : Data of PNUH**



**Conclusion:** Endovascular treatment for complicated aortic dissection and malperfusion syndrome was a safe procedure with good mid-term clinical outcomes. More clinical data and long term follow up are needed.