



# **Endovascular Management of Uncomplicated Type B Aortic Dissection : It's Time to Think Differently ?**

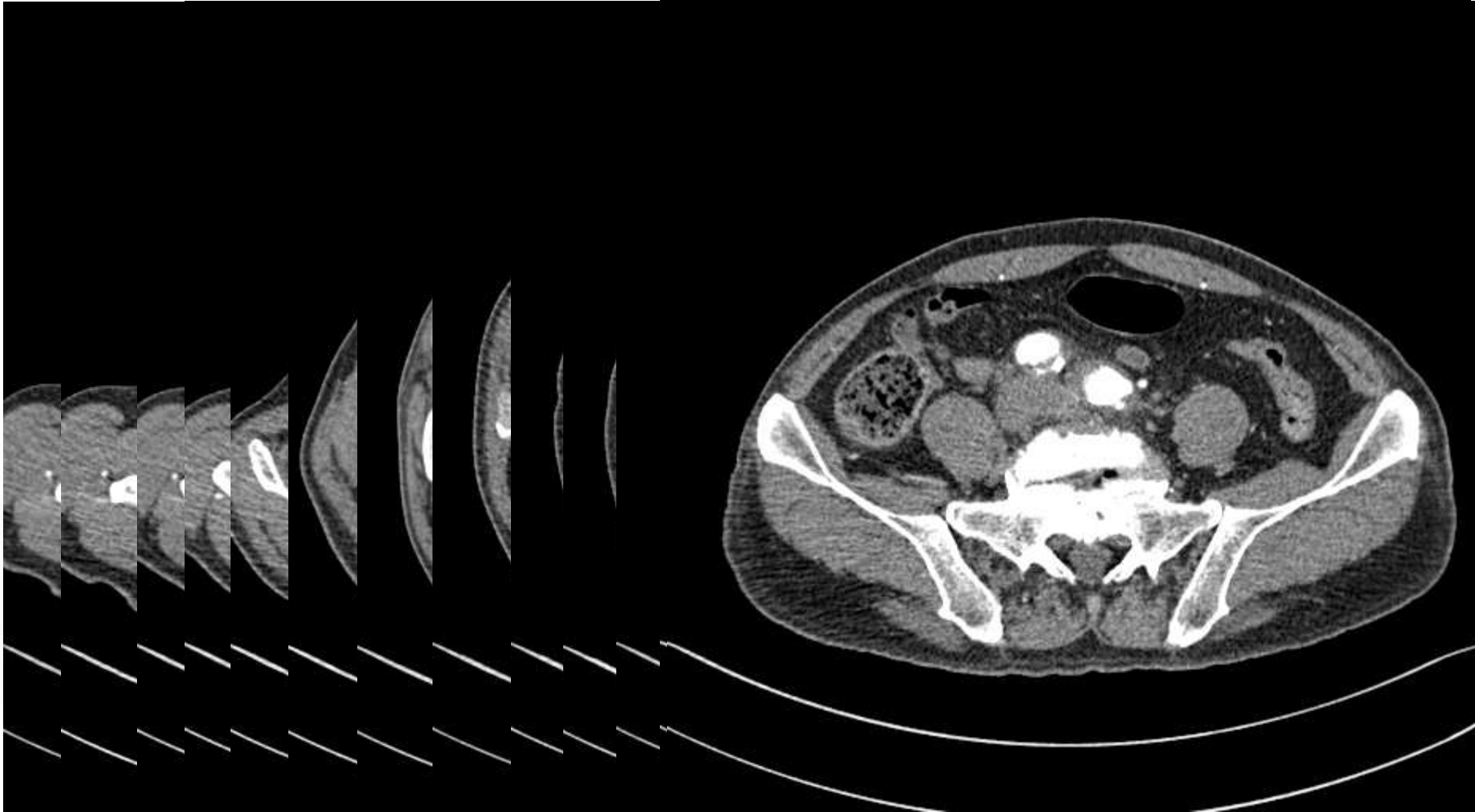
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Pusan National University Hospital,  
Busan, South Korea**

# CASE



- **74 years old male**
- **CC: Chest pain & back pain**
- **CV risk: HTN (untreated)**
- **V/S at ER: 220/120 mmHg & 66 bpm**
- **CT at ER: aortic dissection, stanford type B  
compromised right renal artery from false lumen**

# CASE : CT at ER



# CASE

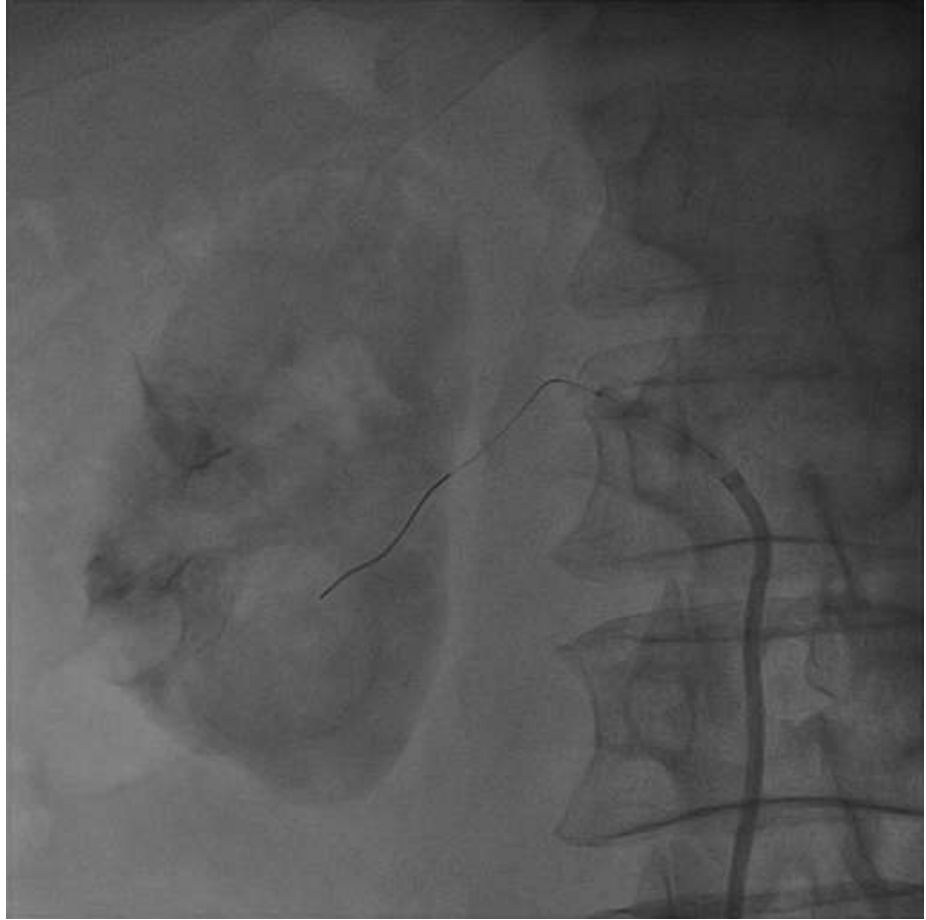
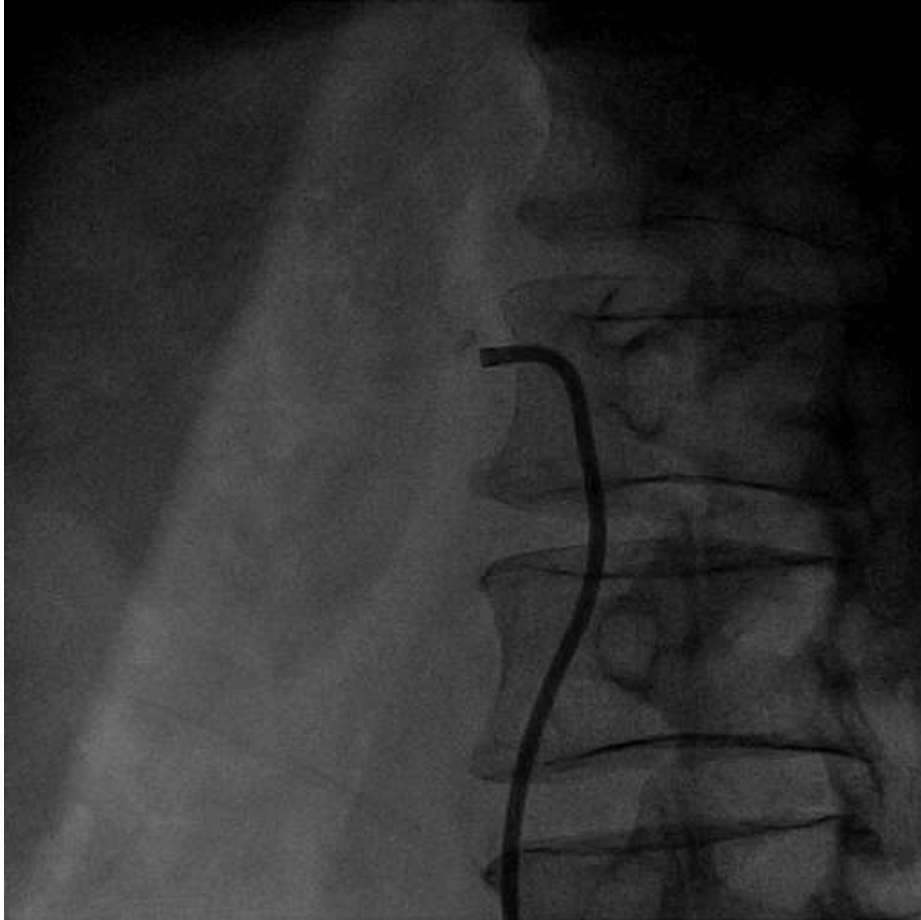


- **CT at ER: aortic dissection, stanford type B compromised right renal artery from false lumen**
- **Lab: Cr 2.0, Hb 14**
- **Right renal stenting and Medical treatment with labetalol, nitroprusside**

# CASE : Right Renal Artery Stenting



# CASE : Right Renal Artery Stenting



# CASE : Right Renal Artery Stenting



# **CASE : Right Renal Artery Stenting**





# **CASE**

**: I will show the result at the end.**

# **Who's a Candidate for TEVAR in Type B AD**

## **STABLE 1 Trial : 2 Year Data**

- **Prospective multicenter clinical trial on the endovascular treatment of complicated type B aortic dissection**
- **Acute / Chronic**
- **86 pts**
- **30 day mortality : 4.7%**
- **Positive aortic remodelling**

# **STABLE 1 Trial : 2 Year Data**

## **Acute phase Treatment (0-14 days)**

- **Highest stroke rates**
- **Retrograde dissection**
- **Aortic dilatation**

## **Chronic phase Treatment (>14 days)**

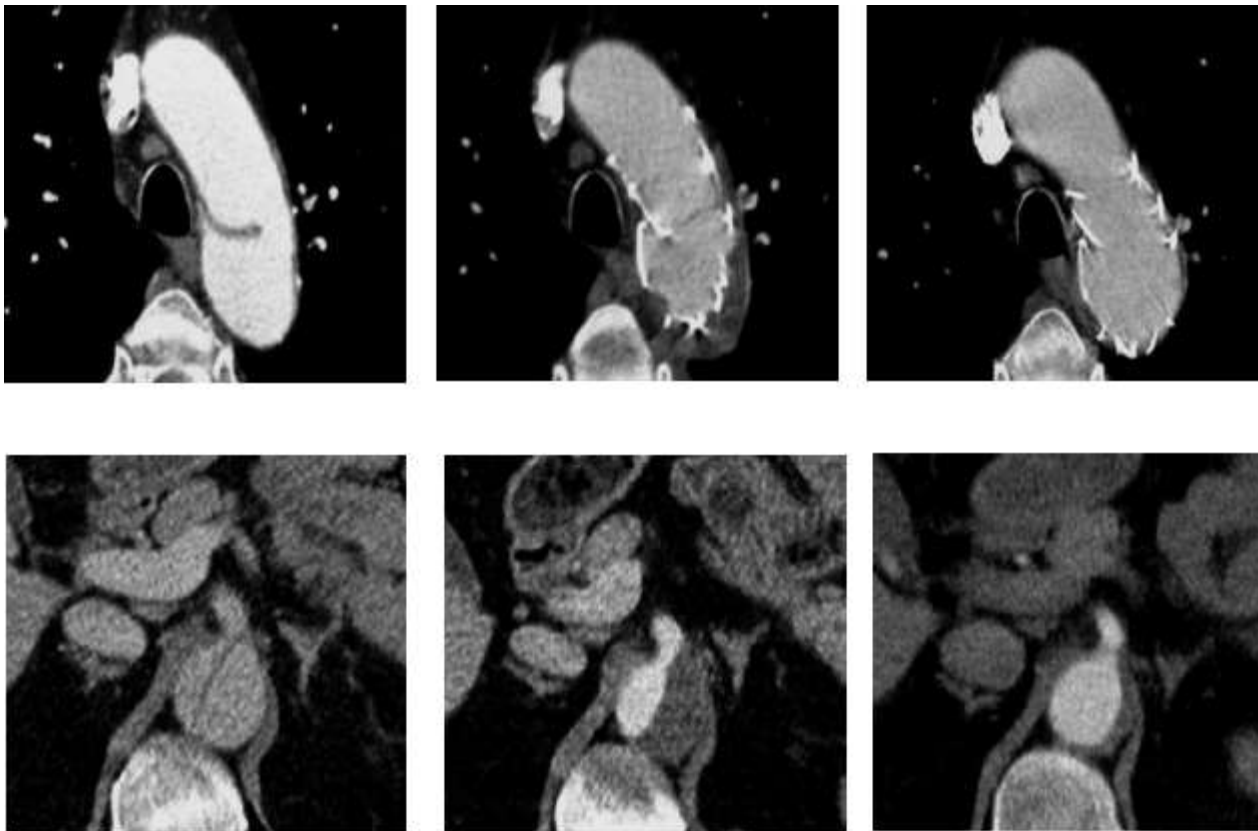
- **No stroke reported**
- **Positive aortic remodelling**

# Who's a Candidate for TEVAR in Type B AD

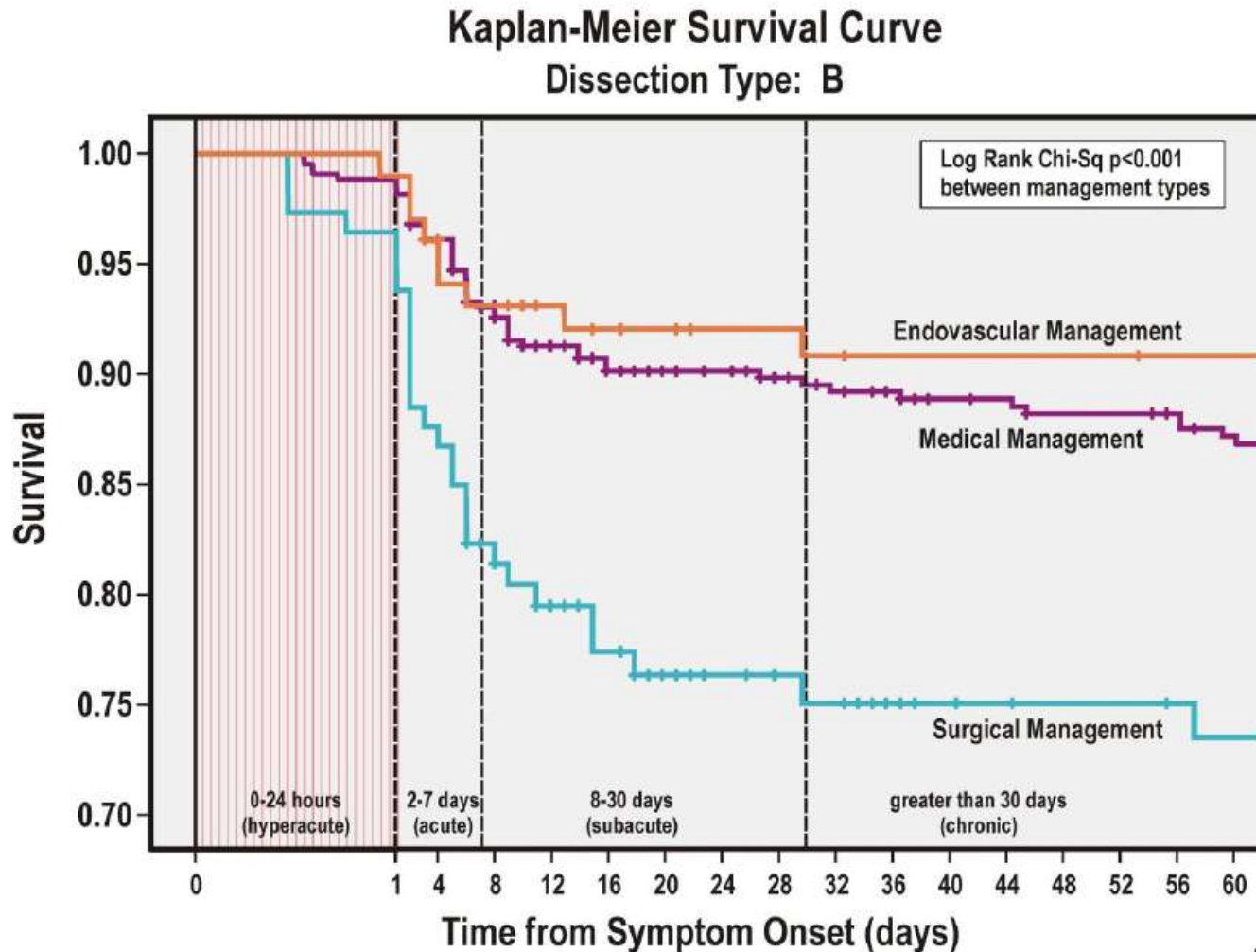
- **Rupture**
- **Malperfusion**
- **Aneurysm**
- **Persistent pain**
- **Refractory HT**

# TEVAR in Uncomplicated Type B AD ?

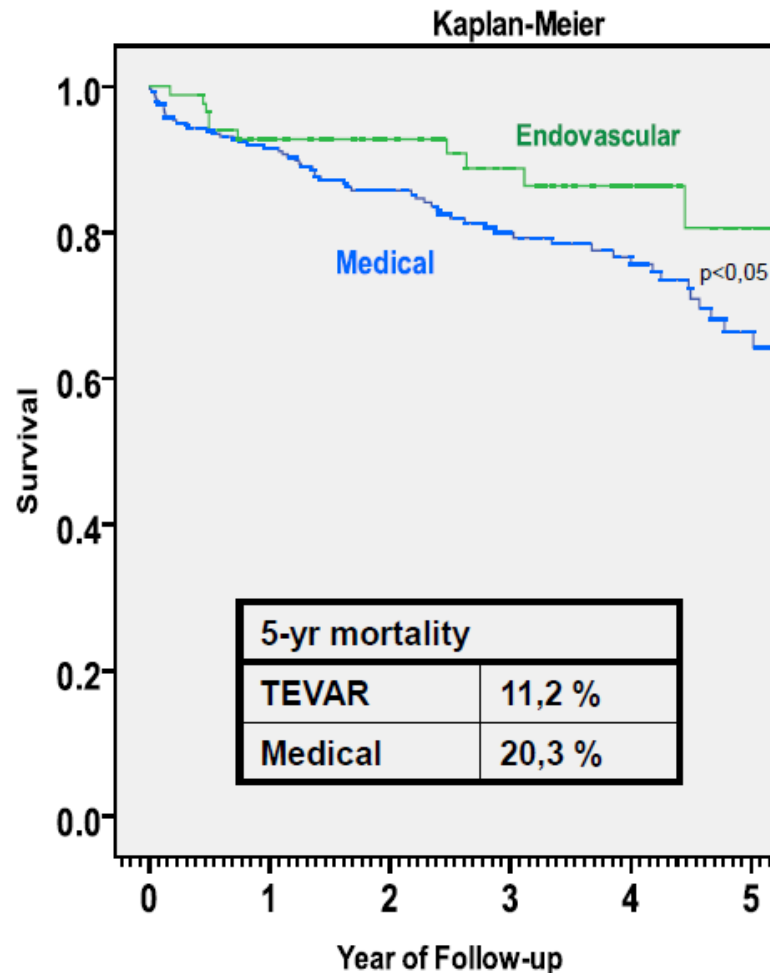
## ➤ Induced aortic remodelling after stent graft



# TEVAR in Uncomplicated Type B AD ? : Short-Term Outcomes in IRAD

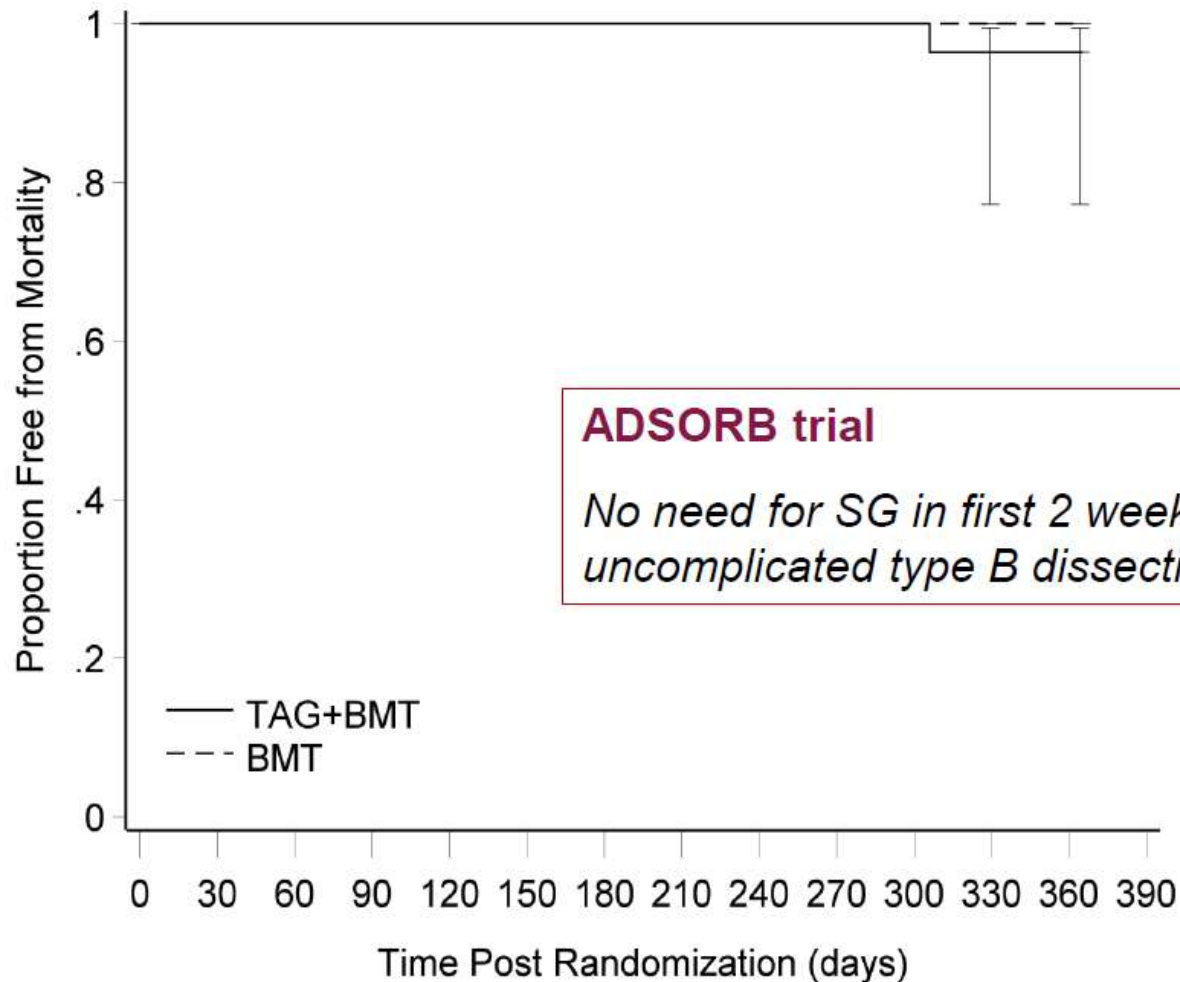


# TEVAR in Uncomplicated Type B AD ? : Long-Term Outcomes in IRAD



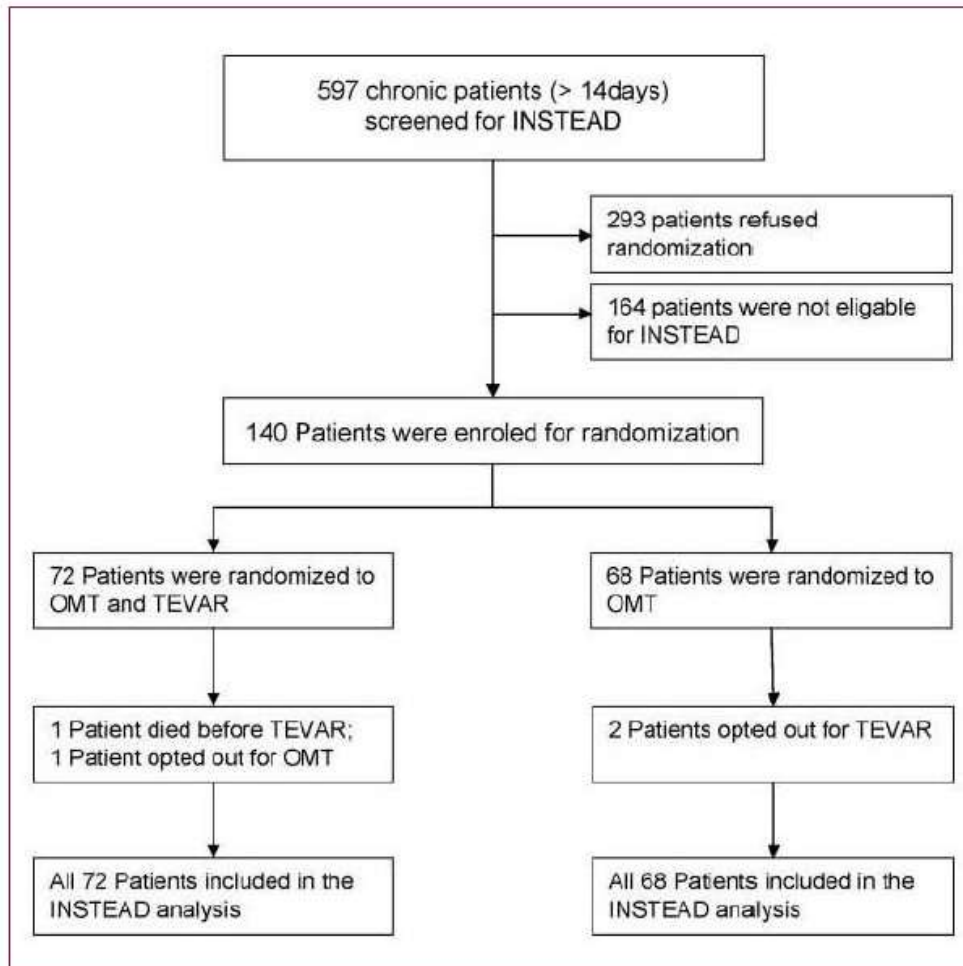
# ADSORB : 1 Year Mortality (GORE TAG)

## Uncomplicated Type B AD by TEVAR



# INSTEAD Study

## : 2 yr Outcomes of Uncomplicated Type B AD by TEVAR



# **INSTEAD Study**

## **: 2 yr Outcomes of Uncomplicated Type B AD by TEVAR**

### **Primary endpoint**

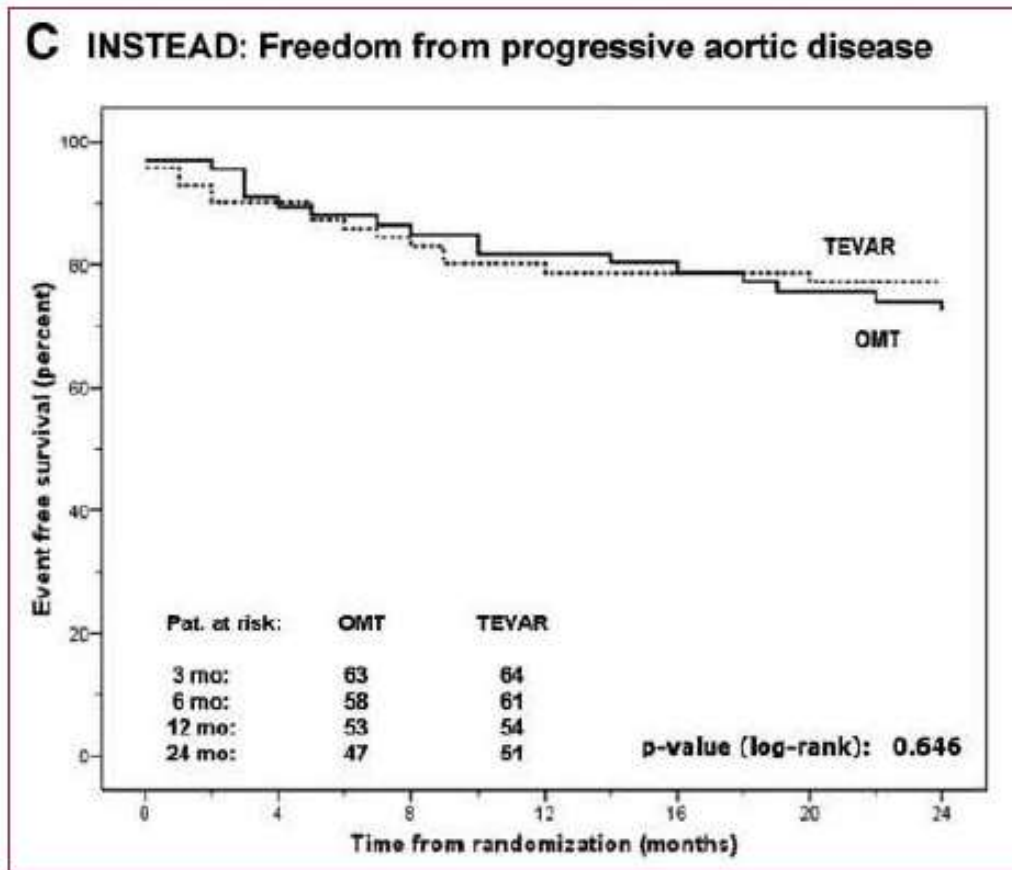
- ❑ All-cause mortality at 2 years

### **Secondary endpoints**

- ❑ Thrombosis of False Lumen
- ❑ Degree of Aortic Expansion
- ❑ Cardiovascular morbidity
- ❑ Quality of life
- ❑ Length of ICU and hospital stay
- ❑ Crossover

# INSTEAD Study

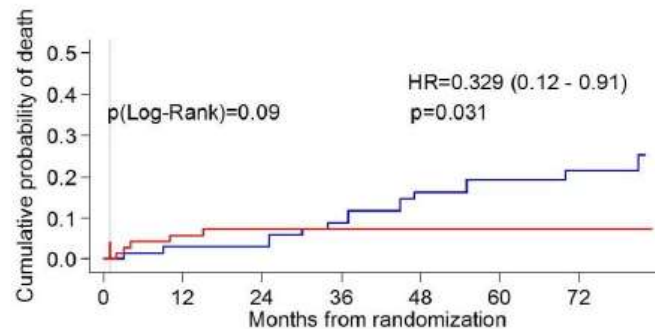
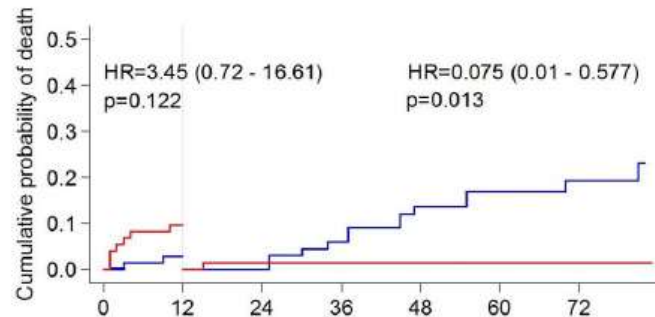
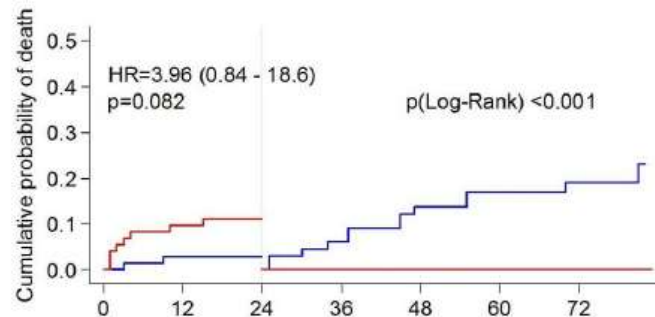
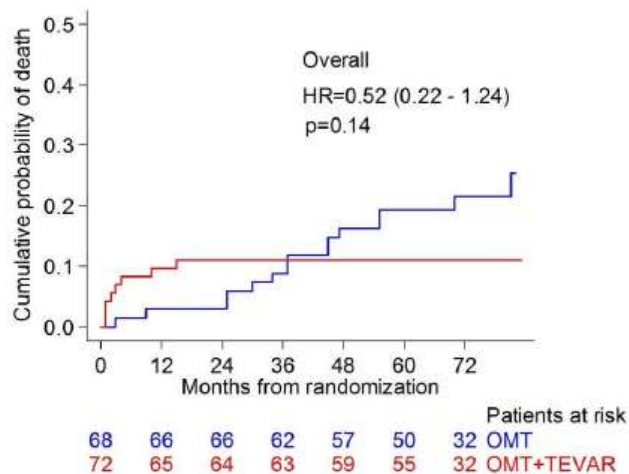
## : 2 yr Outcomes of Uncomplicated Type B AD by TEVAR



# INSTEAD-XR

## : 5 yrs Outcomes after TEVAR in Chronic Dissection

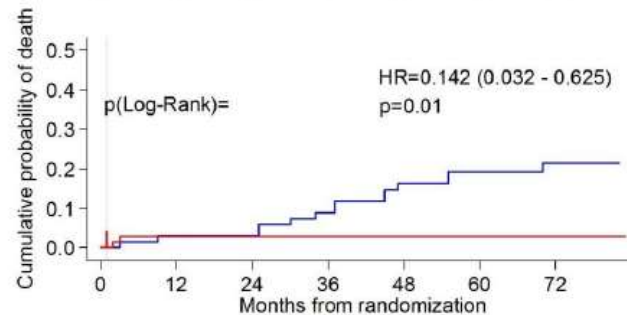
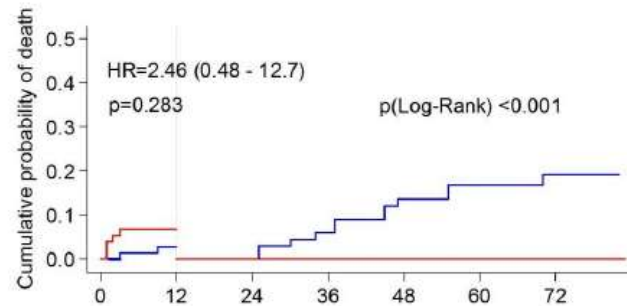
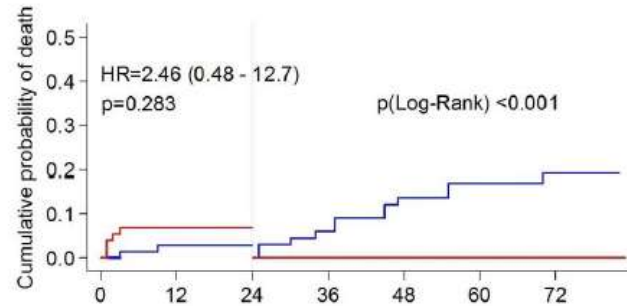
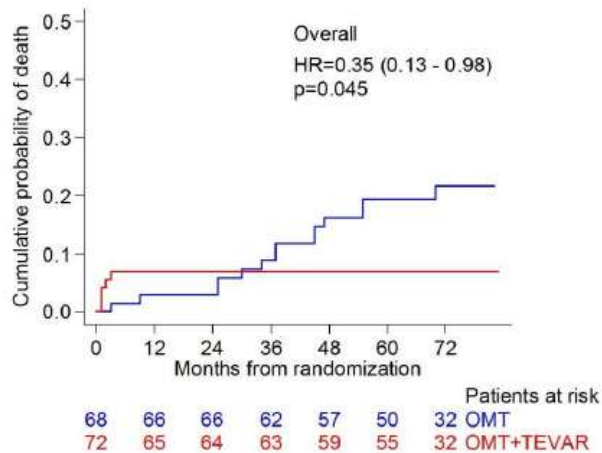
### Mortality (1st EP)



# INSTEAD-XR

## : 5 yrs Outcomes after TEVAR in Chronic Dissection

### CV death (2nd EP)



# **INSTEAD-XL and IRAD-LT : Extended Length of Follow up**



- Uncomplicated type B dissection is not stable and medical management is not safe
- Isolation of the false lumen leads to remodeling
- Successful remodeling (usually completed after 2 years) ensures longterm stability
- Preemptive TEVAR in initially uncomplicated type B dissection enables remodeling and is a therapeutic option.

# Is Uncomplicated Type B AD a Candidate for TEVAR ?

- **INSTEAD 2 Yr : Random Study → Fail**
- **ADSORB 1 Yr : Random Study → Fail**
- **INSTEAD-XL : Extended Study of Follow up**
- **IRAD-LT : Extended Study of Follow up**

## **Registry Data**

→ Favorable Results, Good aortic remodelling

# Risk for Late Reoperation in Type B AD



- **Aorta > 4cm**

Onitsuka, et al. ATS 2004 (Japan)

Winnerkvist, et al. EurJEVS 2006 (Sweden)

- **False Lumen > 22mm**

Song, et al. JACC 2007

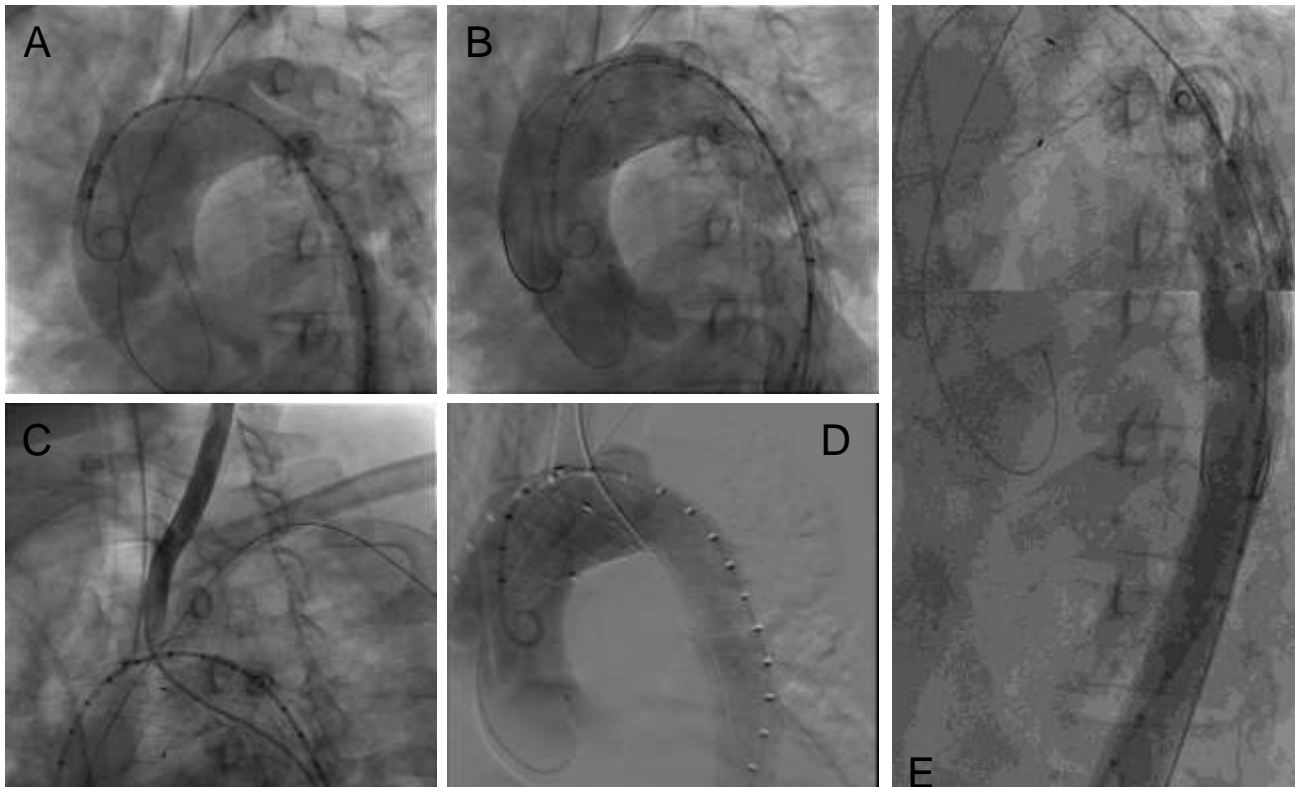
- **Partially Thrombosed False Lumen**

Tsai, et al. NEJM 2007

# Is Uncomplicated Type B AD a Candidate for TEVAR ?

## : Unsolved Problem

- Intima tear site is usually near left subclavian artery.



# Is Uncomplicated Type B AD a Candidate for TEVAR ?

## : Unsolved Problem

➤ **Birdbeak** → Retrograde aortic dissection



# Is Uncomplicated Type B AD a Candidate for TEVAR ?

## : Unsolved Problem

➤ Birdbeak → Retrograde AD



**Zenith**  
*Toshomba, et al*



**Talent**



**TAG**

# Is Uncomplicated Type B AD a Candidate for TEVAR ? : Unsolved Problem

➤ Paraplesia

➤ Stroke

*Especially sacrifice of left SCA*

Parameter	Conventional	Stent	p Value
Length of intervention (min)	320 ± 94	150 ± 28	< 0.05
Mean length of intensive care unit stay (days)	13 ± 15	4 ± 2	< 0.05
Mean hospital stay (days)	10 ± 3	6 ± 1	< 0.05
Spinal cord injury (%)	12	0	NS
Operative mortality (%)	31	10	NS

Values are mean ± standard deviation.

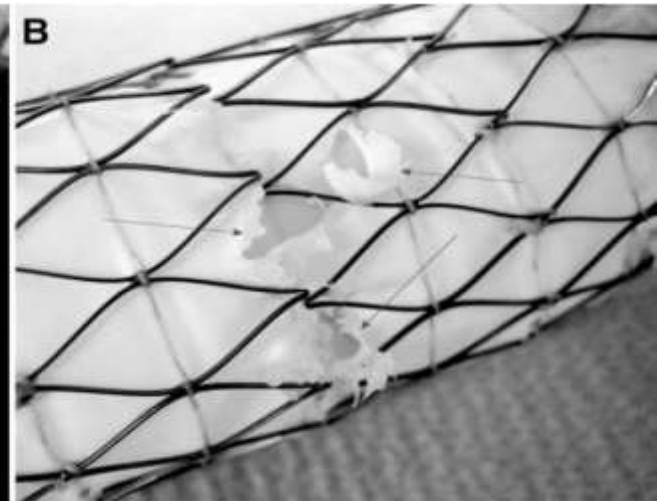
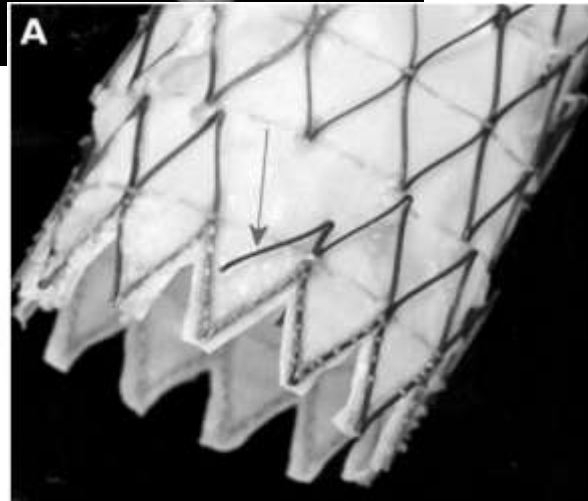
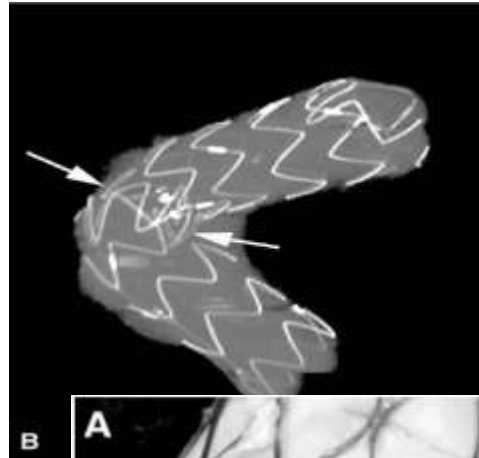
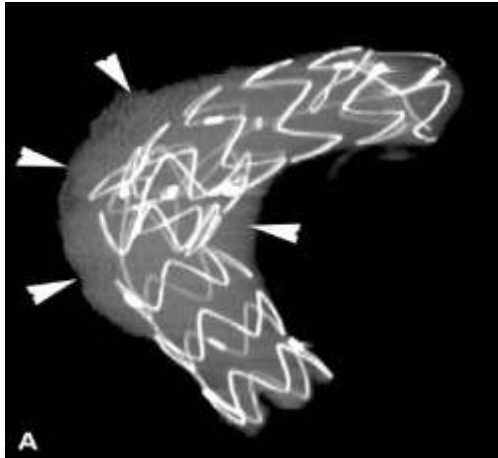
NS = not significant.



# Is Uncomplicated Type B AD a Candidate for TEVAR ? : Unsolved Problem

- Stent graft migration, Stent fracture, Fabric tear

during long term follow up



# SUMMARY



- **No well designed randomized study**
- **No long term data more than 10 years**
- **Birdbeak appearance of stent graft : retrograde AD**
- **Good remodeling of aorta**



# **Are We going to Endovascular Management of Uncomplicated Type B Aortic Dissection ?**

**It is too early to do TEVAR in all cases.**

**But, we can extend TEVAR indication in uncomplicated type B AD near future**

# SUMMARY



- **Acute complicated distal dissections : TEVAR**
- **Acute high-risk uncomplicated : Consider delayed TEVAR**
- **Acute low-risk uncomplicated : medical**
- **Chronic with aneurysmal change : TEVAR**

# **CASE : Admission day #5**

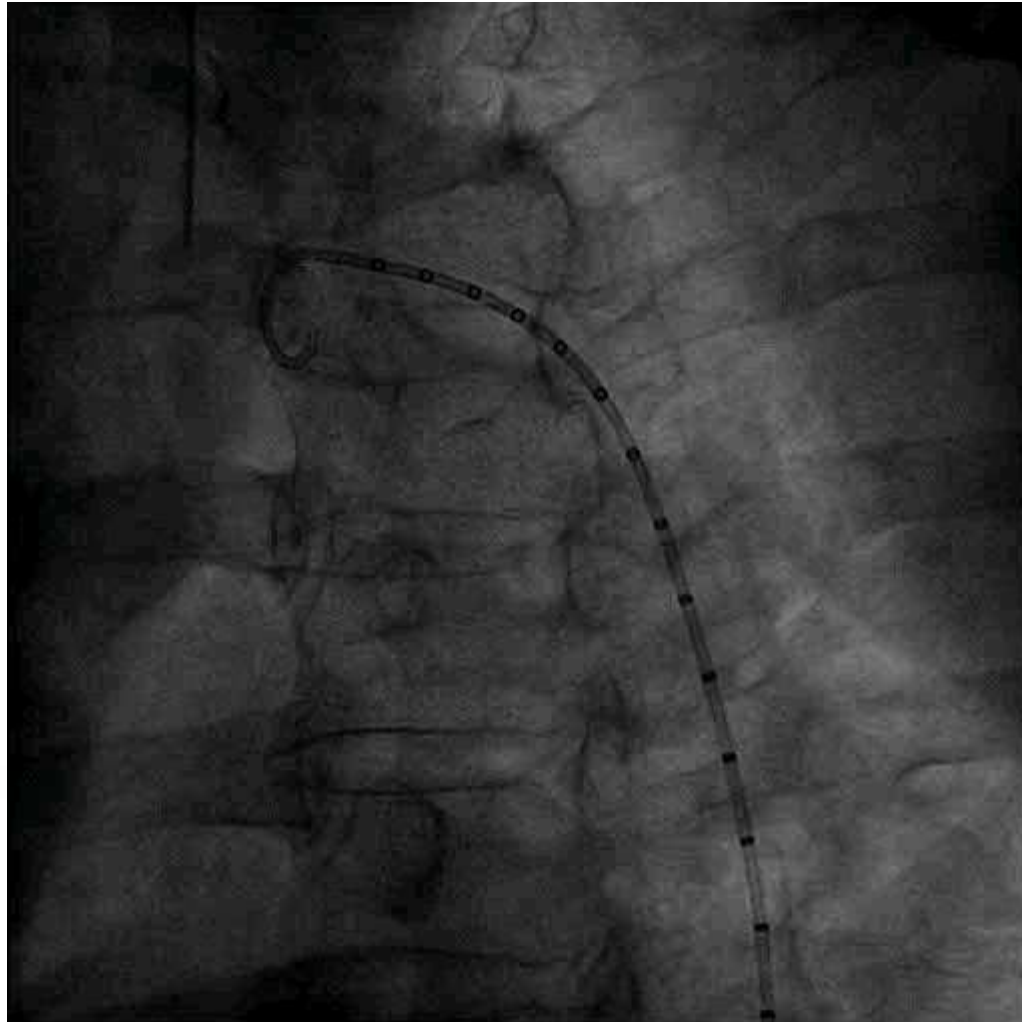


- **V/S : 183/81 mmHg & 56 bpm**
- **Numbness and Pulse deficits at lower extremities**

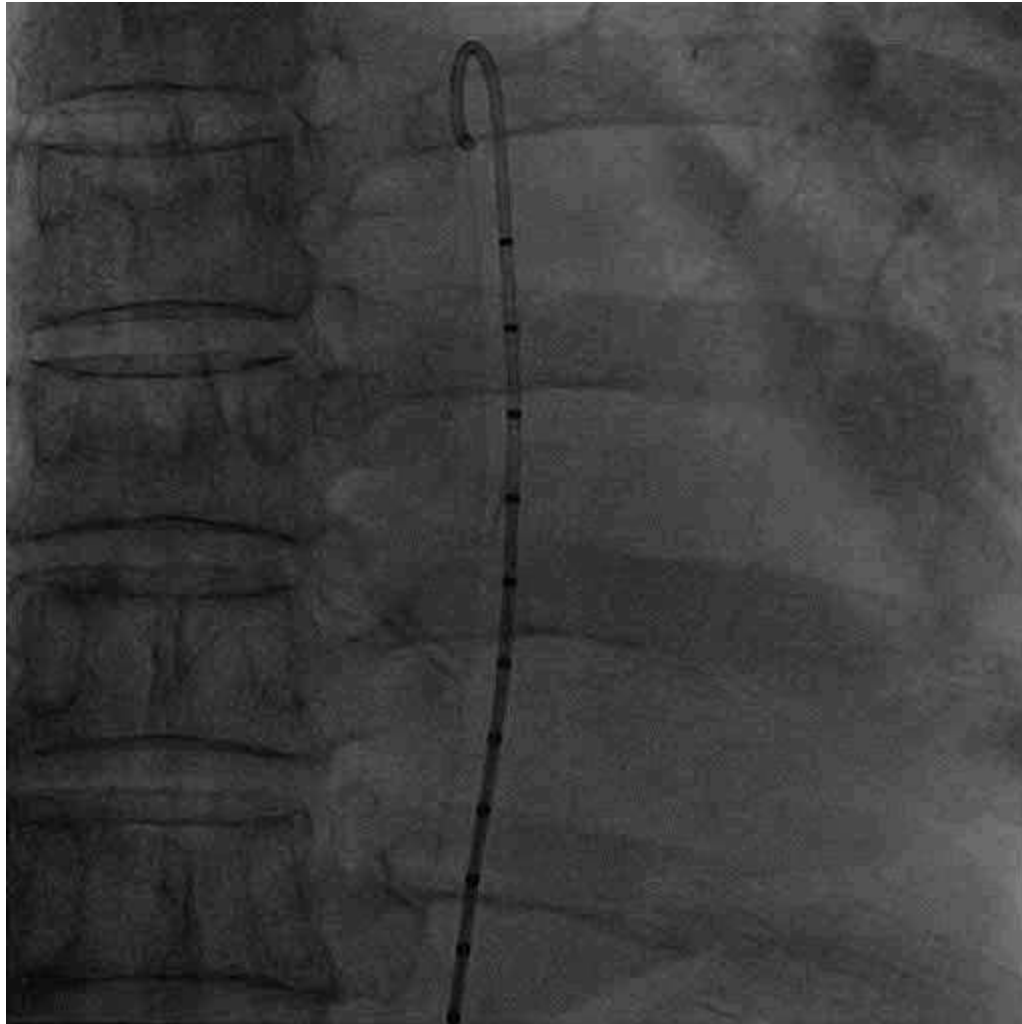
# Follow up CT (day 5)



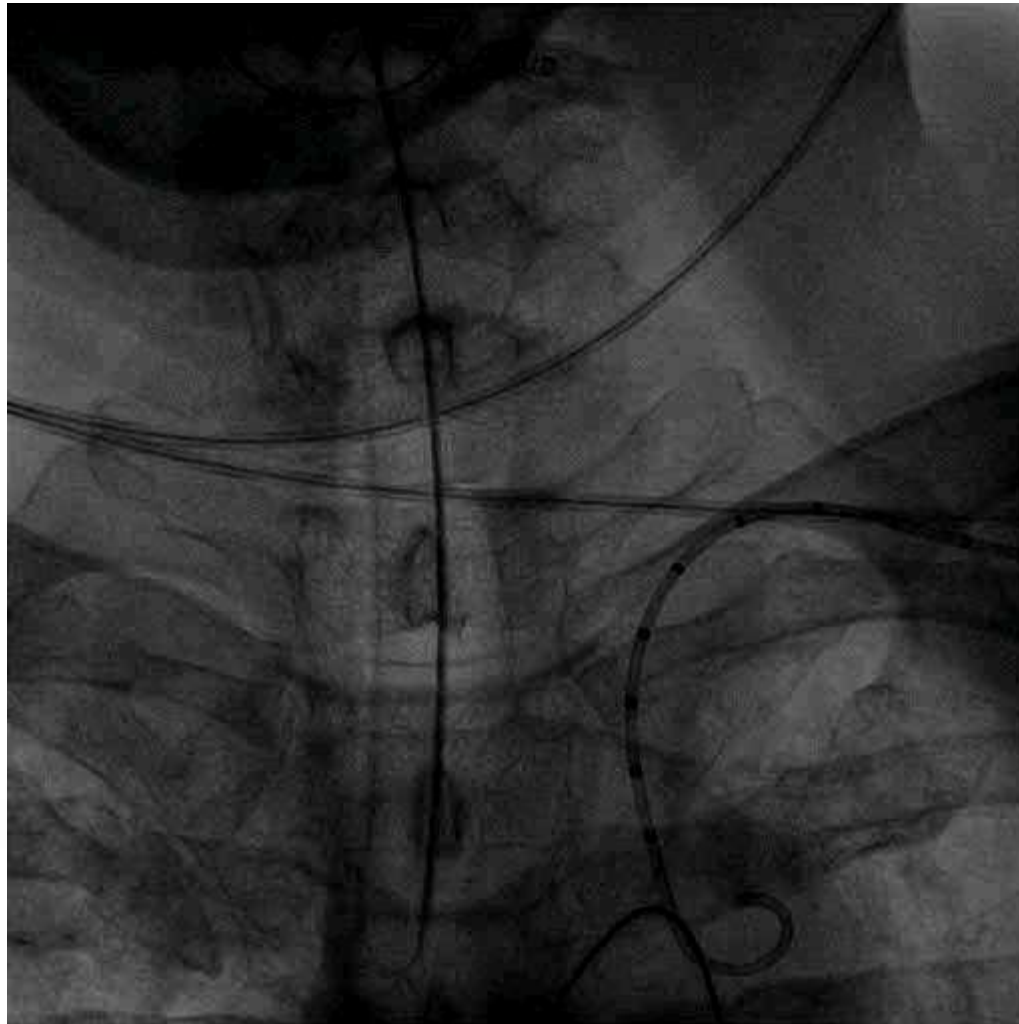
# Aortic Stent Graft for Malperfusion



# Aortic Stent Graft for Malperfusion



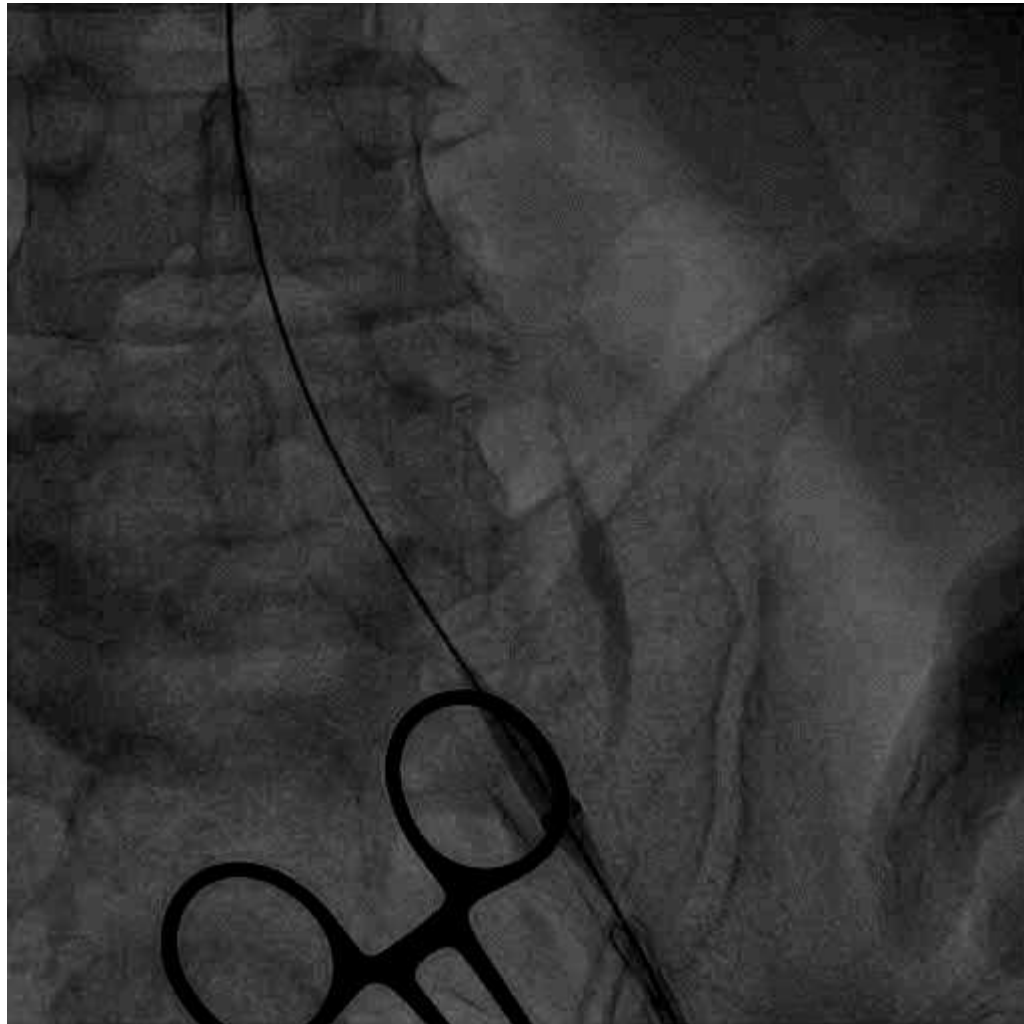
# Check Left Vertebral Artery



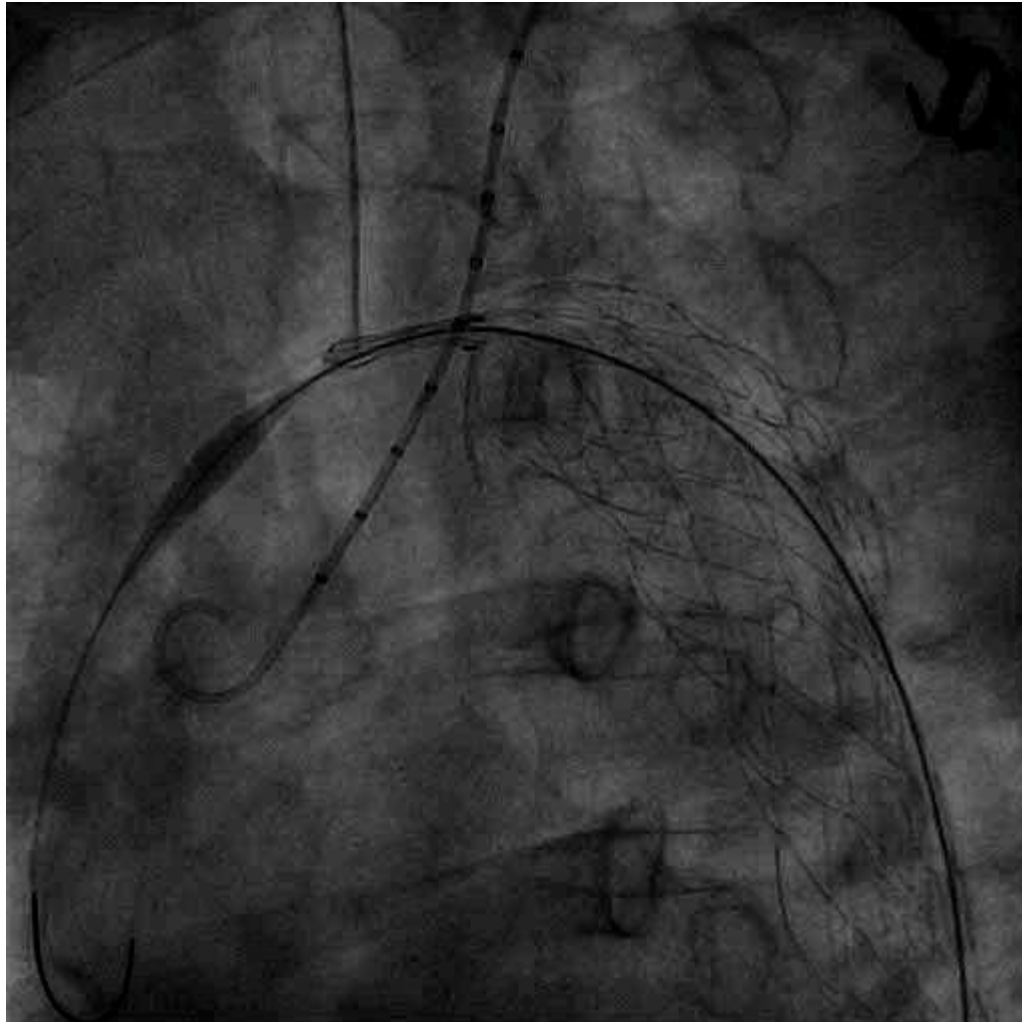
# Aortic Stent Graft for Malperfusion



# Aortic Stent Graft for Malperfusion



# Aortic Stent Graft for Malperfusion



# **Aortic Stent Graft for Malperfusion**



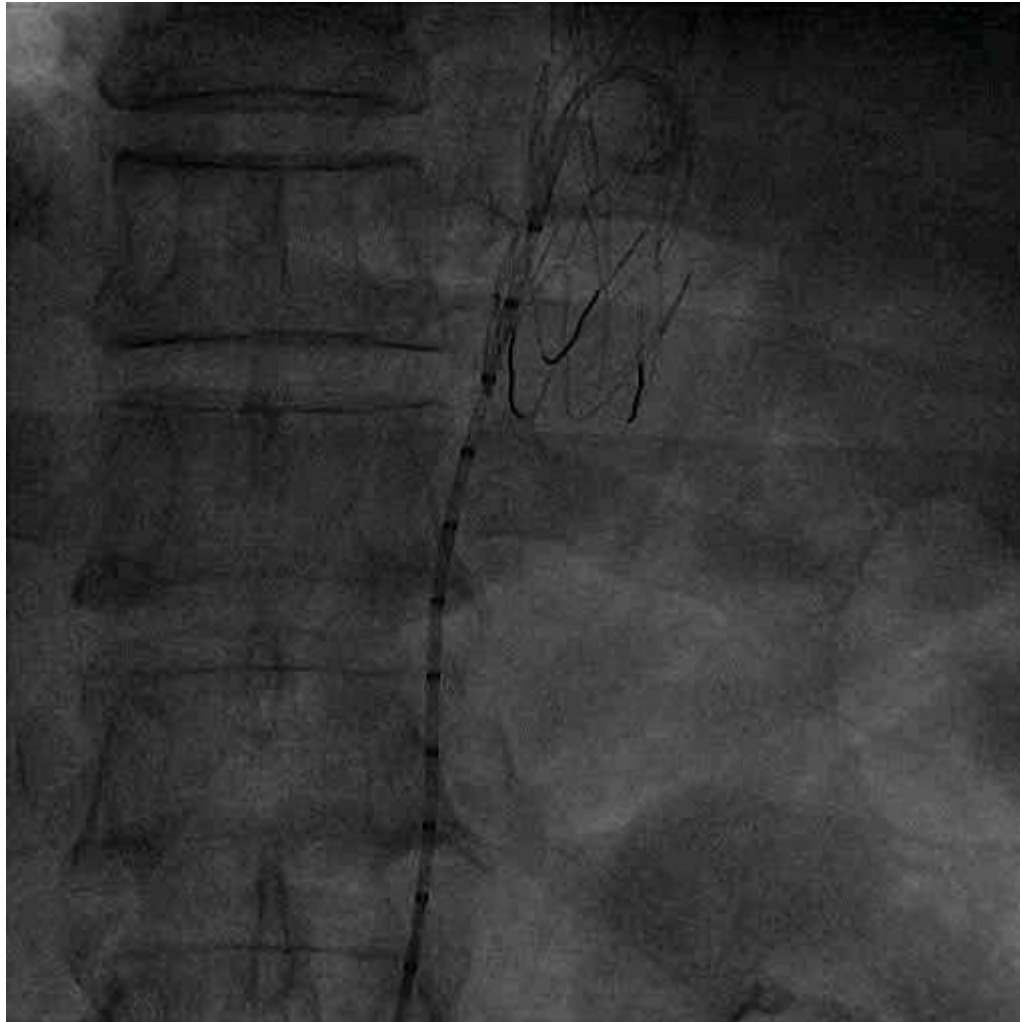
# Aortic Stent Graft for Malperfusion



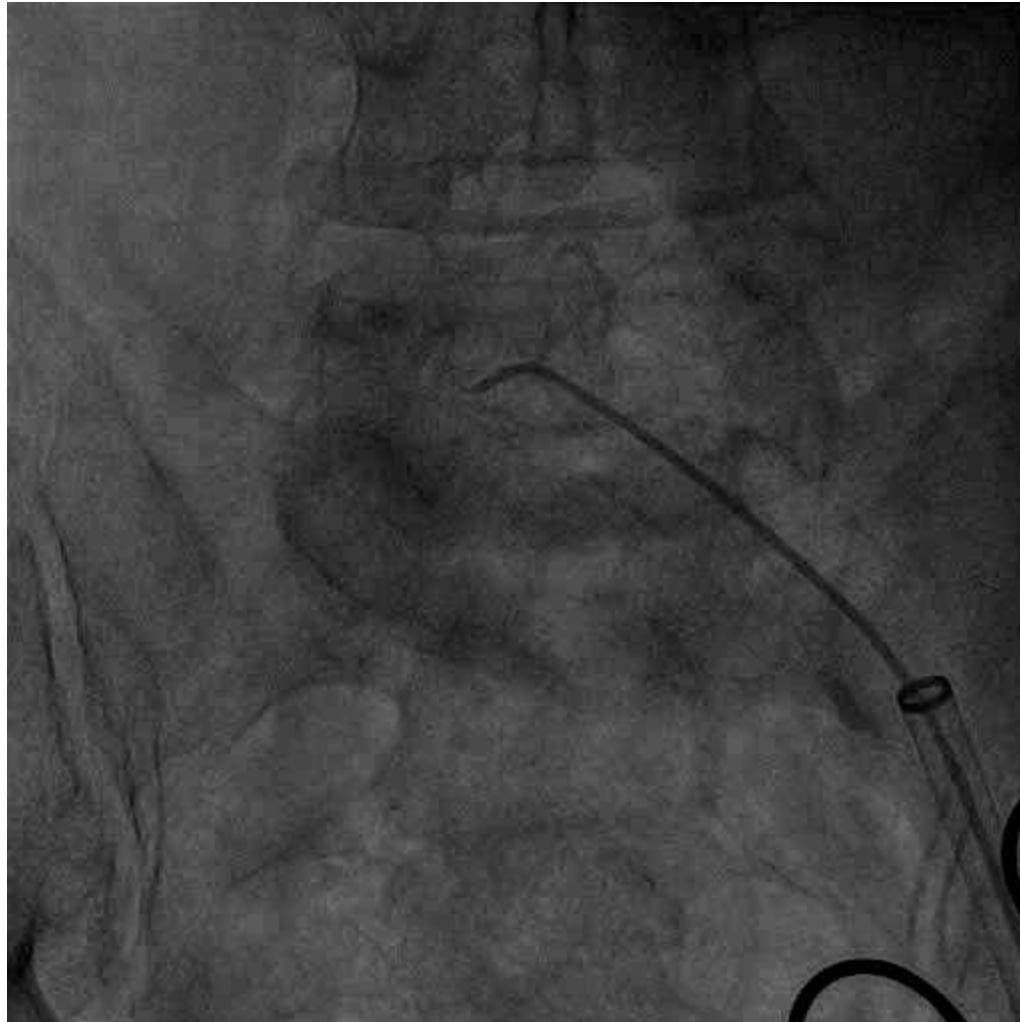
# **Aortic Stent Graft for Malperfusion**



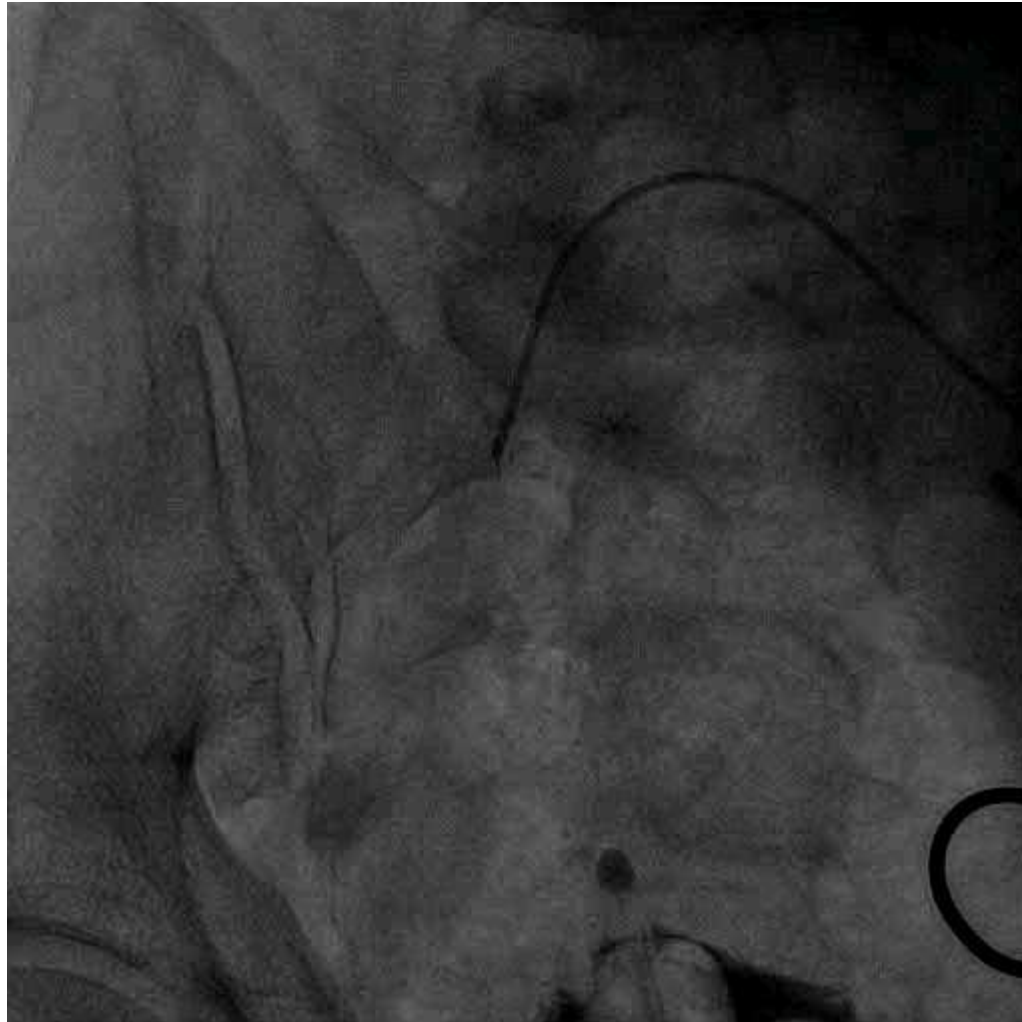
# Aortic Stent Graft for Malperfusion



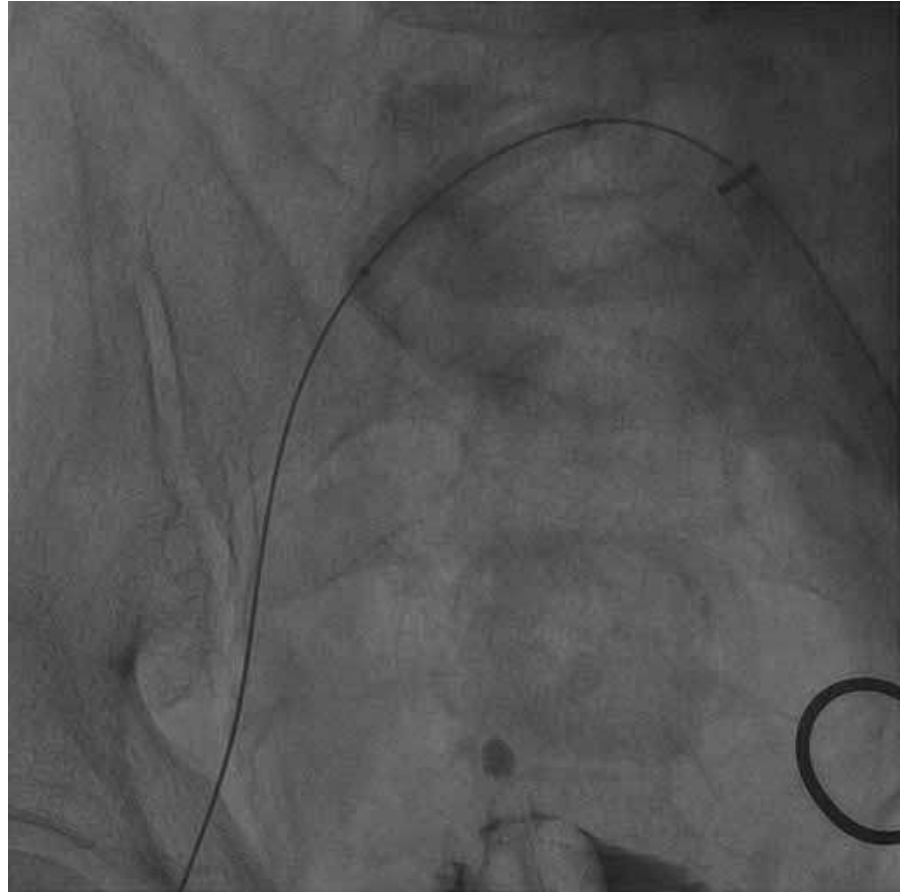
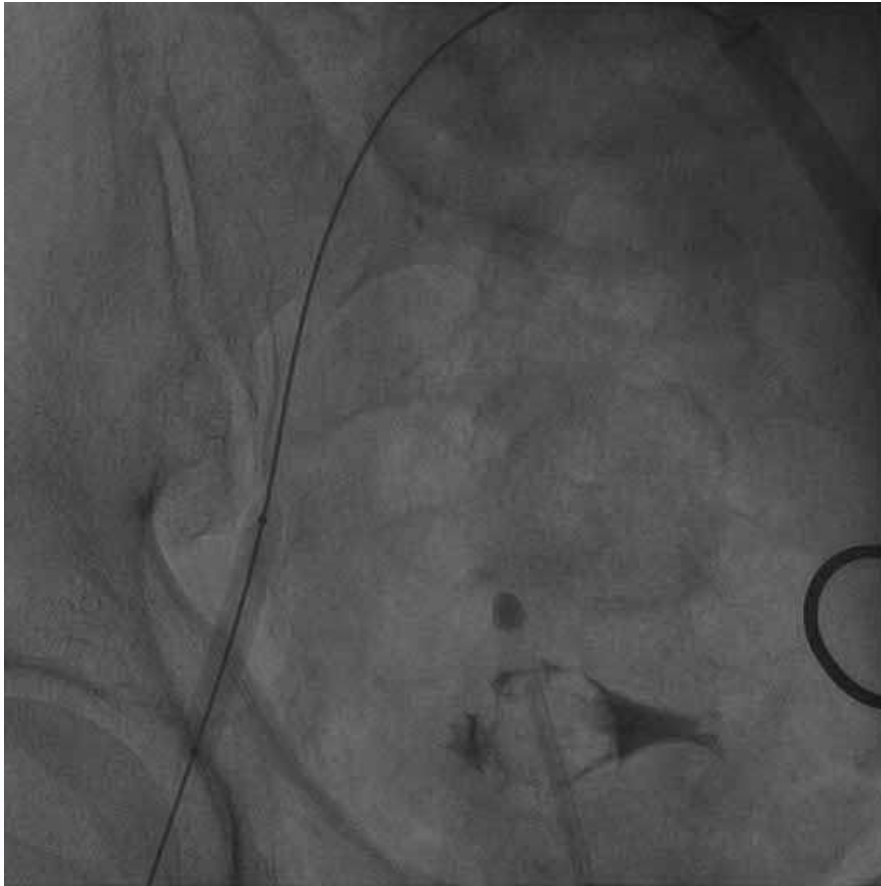
# Right Iliac Stenting for Malperfusion



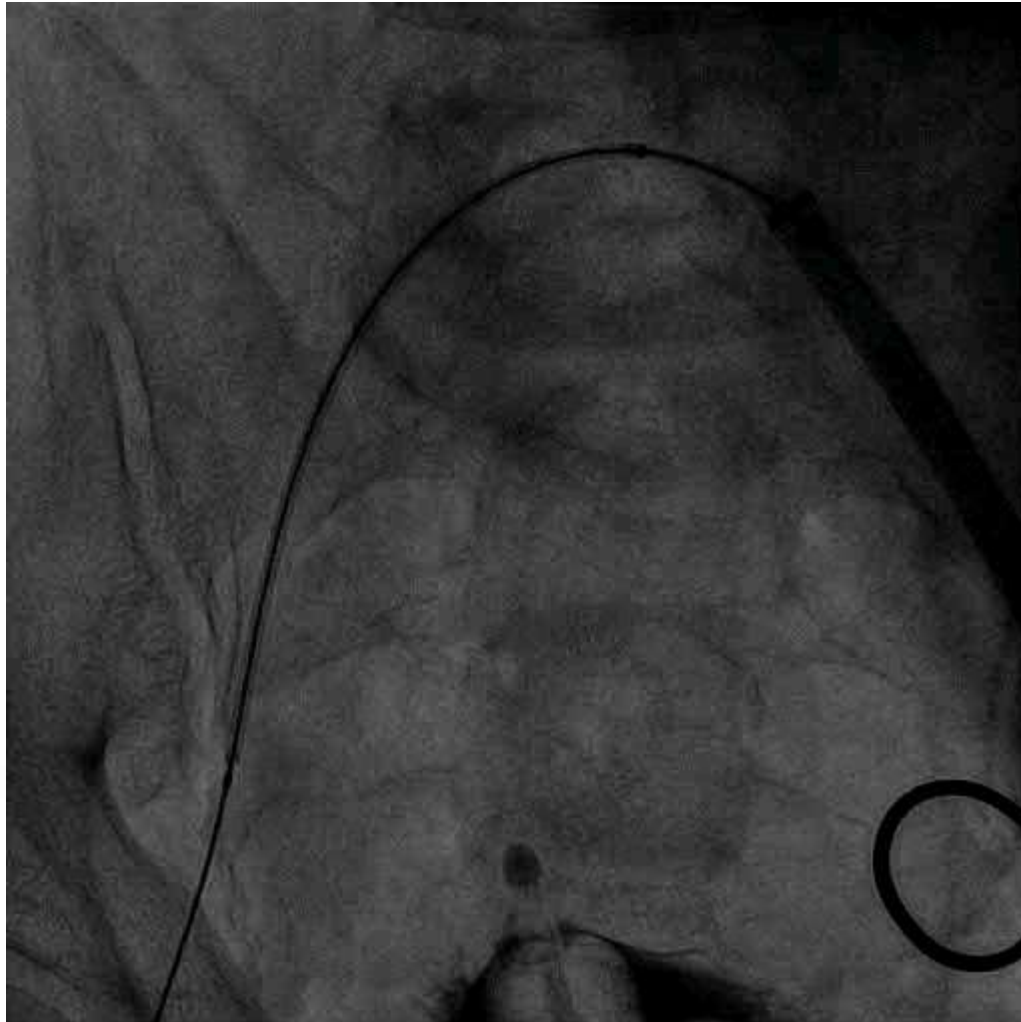
# Aortic Stent Graft for Malperfusion



# Right Iliac Stenting for Malperfusion



# Right Iliac Stenting for Malperfusion



# **Chimney Aortic Stent Graft with Renal, Iliac Artery Stenting for Malperfusion Syndrome**



# Endovascular Treatment for complicated type B aortic dissection with malperfusion syndrome : Pusan National University Data



**Table 1. Clinical outcomes**

Patient No.	15
Male Gender	13 (86.7%)
Mean age	54.3±14.2
Technical success	100% (15/15)
Mortality	6.6% (1/15)
Neurologic complication	1 (TIA)
Procedure related complication	4 (CIN), 3 (anemia)
Aortic dissection type	
AD type A	3
AD type B	11
Intramural hematoma, type B	1
Treating lesion (N=19)	
Celiac artery stenting	3
Renal artery stenting	6
Iliac artery stenting	6
Common carotid artery stenting	2
Left subclavian artery stenting	1
Distal abdominal aorta stenting	1

## Malperfusion syndrome involved in

celiac artery 4  
superior mesenteric artery 1  
renal artery 6  
iliac artery 6  
common carotid artery 2  
left subclavian artery 1

## Management

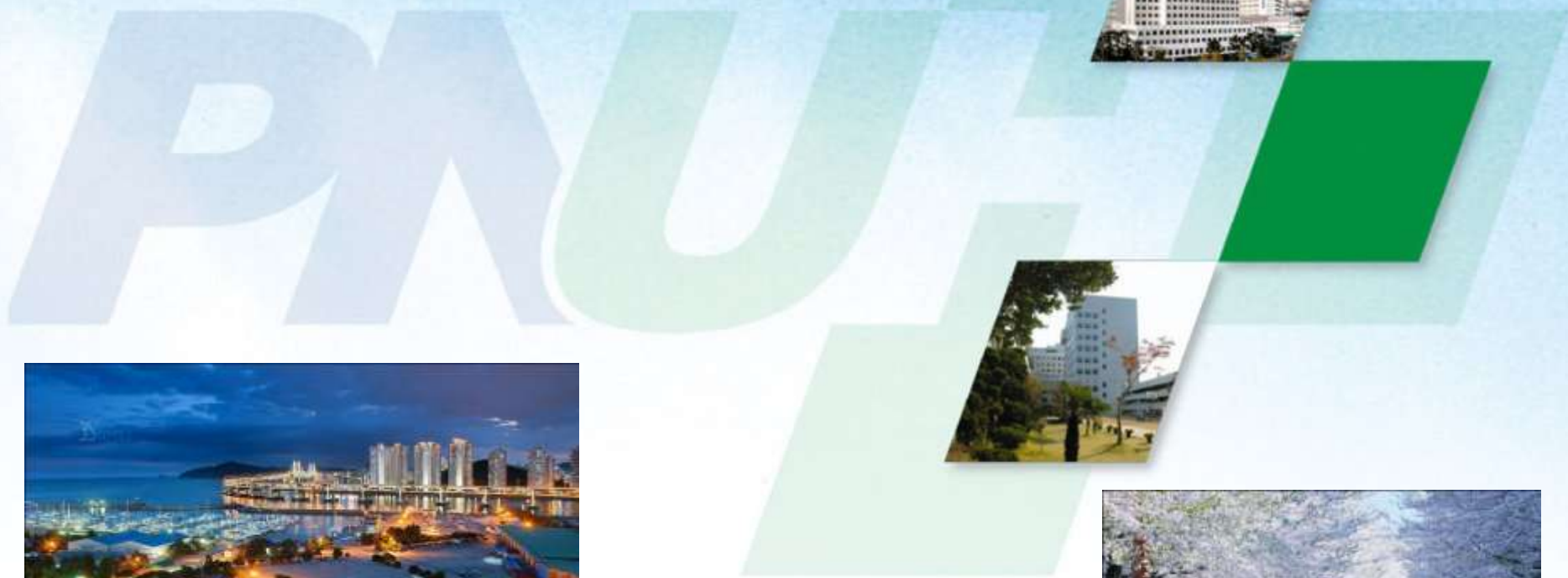
aortic stent graft 7  
selective stenting 19 arteries  
fenestration 1

Technical success : 100%(15/15).  
Mortality rate : 6.6%(1/15)  
Follow up duration: 17.2 (0.4-37.7 mon)

# Endovascular Treatment in Ruptured Type B AD

## : Pusan National University Data

Clinical outcomes for Ruptured aortic dissection, n=7	
Technical success	71.4%
Cumulative events	
Death	1 (14.3%)
Aorta related death	0
Secondary intervention	0
Major stroke/Paraplesia	1 (14.3%)
Secondary endoleak	1 (14.3%)



**Thank you for your attention**