



Case sharing: TYPE 1B ENDOLEAKS

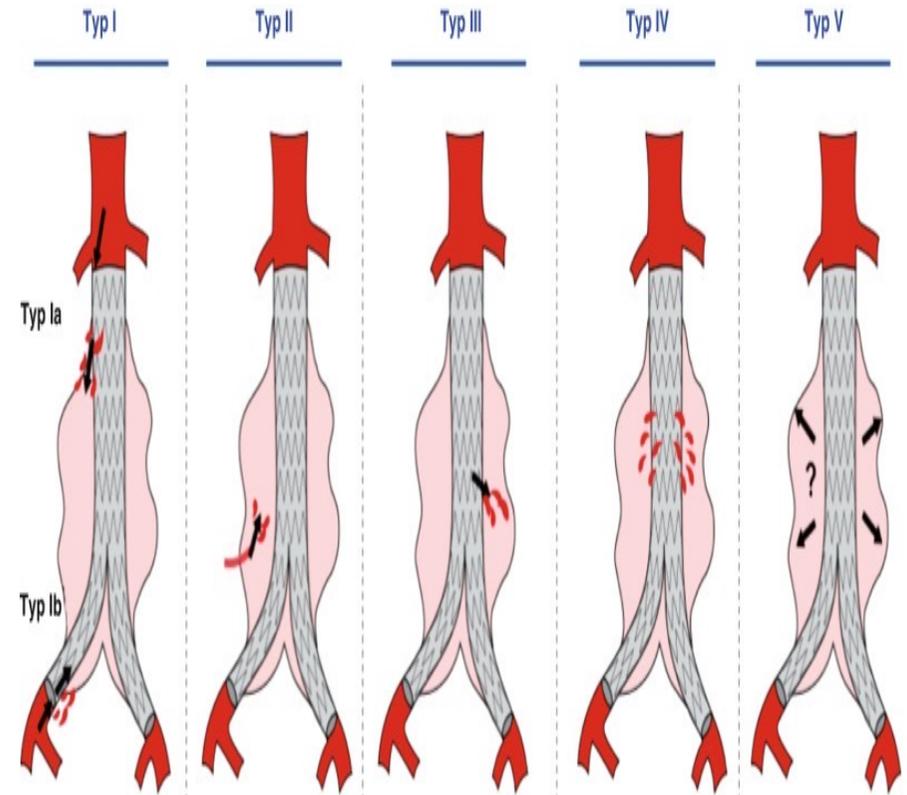
Le Duc Tin, MD, Ph.D.

Vascular Surgery Dept, Cho Ray Hospital,
HCMC, Vietnam



INTRODUCTION

- The use of endovascular stent grafts to prevent rupture of abdominal aortic aneurysm (AAA) is predicated on elimination of arterial perfusion from the aneurysm sac.
- Exclusion of the AAA from the arterial circulation eliminates arterial pressure and thereby prevents aneurysm growth and rupture¹.
- Continued arterial perfusion of the aneurysm sac may occur, however, after endovascular AAA repair.
- This persistent perfusion has been termed “endoleak” and has been observed in 15% to 21% of clinical trials involving commercially produced endovascular stent grafts ^{2, 3}.



INTRODUCTION

RICK FACTORS

- **Diameter and Length of the Distal Seal Zone**

- Similar to as in the proximal sealing zone, snug apposition of the graft and artery over a length of 10 to 15 mm is required to achieve an adequate seal.

- **Iliac Remodeling**

- Over 50% of T1b endoleak occur within 6 months of the index operation for an EVAR ¹

- Recent studies have outlined that both landing zones and iliac arteries are subjected to the outward radial force of the graft, potentially leading to T1b endoleaks ^{1, 2, 3}

- The rate of iliac artery expansion/remodeling is greatest in the first 6 months at nearly a rate of 1 mm/month ²

- **Limb Retraction**

- Limb retraction occurs when the distance between the iliac bifurcation and the distal edge of the last seen has increased by ≥ 5 mm.

Rick factor summary

Large common iliac arteries (> 16 mm) ¹

Short iliac sealing zone (< 10 mm) ¹

Tortuosity of iliac axes ³

Aneurysm sac > 65 mm in diameter ¹

Iliac endografts with a diameter > 24 mm ¹

1. Bianchini Massoni C, Perini P, Tecchio T, Azzarone M, de Troia A, Freyrie A. A systematic review of treatment modalities and out-comes of type Ib endoleak after endovascular abdominal aneu- rysm repair. Vascular 2018;26(01):90–98

2. Tsilimparis N, Dayama A, Ricotta JJ II. Remodeling of aortic aneurysm and aortic neck on follow-up after endovascular repair with suprarenal fixation. J Vasc Surg 2015;61(01):28–34

3. Coulston J, Baigent A, Selvachandran H, Jones S, Torella F, Fisher R. The impact of endovascular aneurysm repair on aortoiliac tortu- osity and its use as a predictor of iliac limb complications. J Vasc Surg 2014;60:585–589



TREATMENT

- **Endovascular extension procedure:**

- **Limb Extension with Possible Internal Iliac**

Embolization: The most common treatment of T1b is limb extension with or without embolization of the internal iliac artery → the new distal seal zone.

- **Iliac branched Device:** The goal is to reduce the risk of complications from bilateral hypogastric artery embolization such as buttock necrosis, bowel ischemia, ischemic colitis, and sexual dysfunction.

- **AUI:** There are cases where is contraindicated due to anatomical restrictions: inadequate length to extend into the external iliac artery, possible thrombus or calcification.

ESVS guideline: 2019.

Recommendation 86

In patients with Type I endoleak after endovascular abdominal aortic aneurysm repair, re-intervention to achieve a seal, primarily by endovascular means, is recommended

Class	Level	References
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I	B	[554,553]
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553. Schlosser FJ, Gusberg RJ, Dardik A, Lin PH, Verhagen HJ, Moll FL, et al. Aneurysm rupture after EVAR: can the ultimate failure be predicted? Eur J Vasc Endovasc Surg 2009;37:15e22.

554. Fransen GA, Vallabhaneni Sr SR, van Marrewijk CJ, Laheij RJ, Harris PL, Buth J. Rupture of infra-renal aortic aneurysm after endovascular repair: a series from EUROSTAR registry. Eur J Vasc Endovasc Surg 2003;26:487e93.





TREATMENT



- **Coil embolization procedure:**

- The patient underwent a coil embolization procedure, which was done through percutaneous arterial access.
- The coil was deployed in the collateral vessel at its origin from the aneurysm sac.

- **Open repair:**

- T1b endoleaks can be managed endovascularly and do not routinely require open surgical repair.





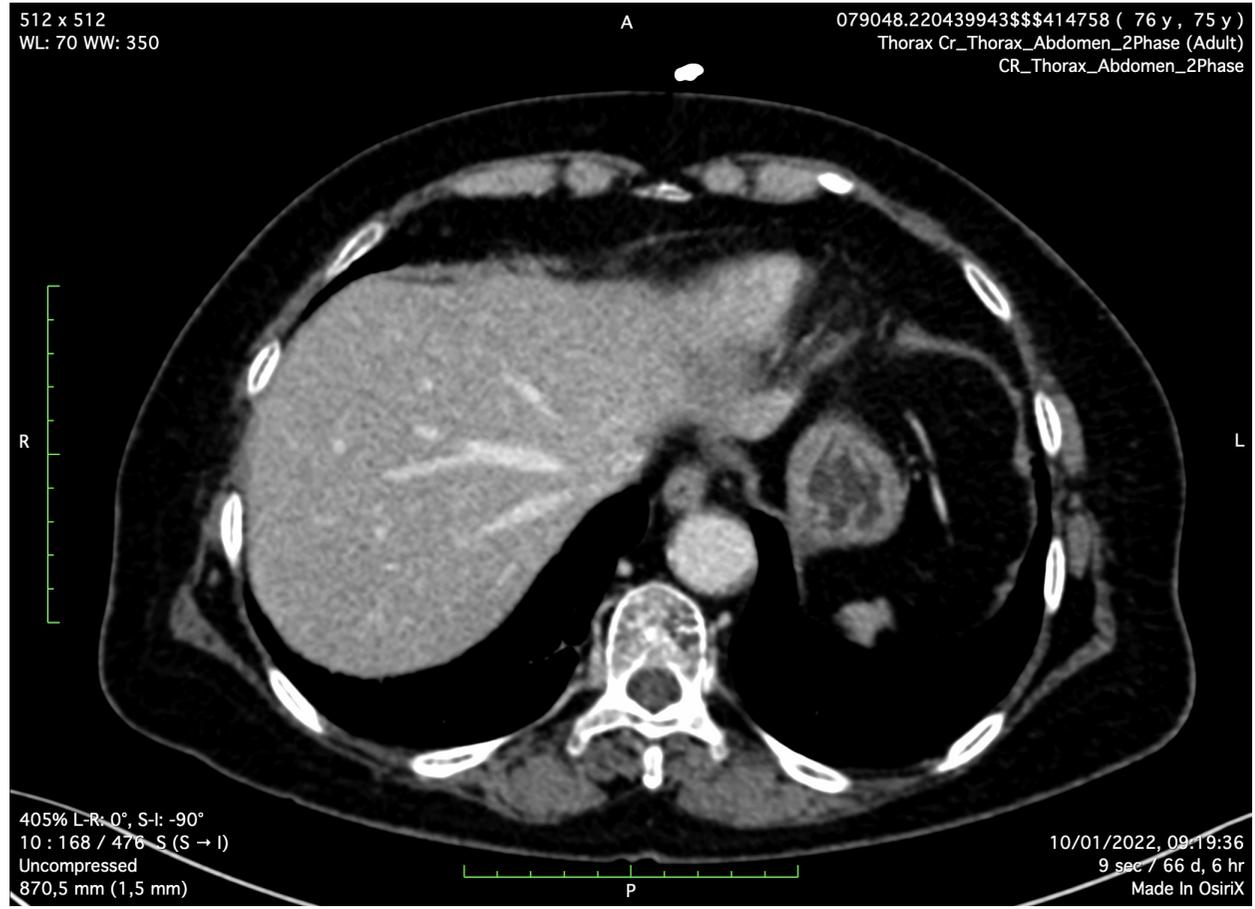
CASE REPORT



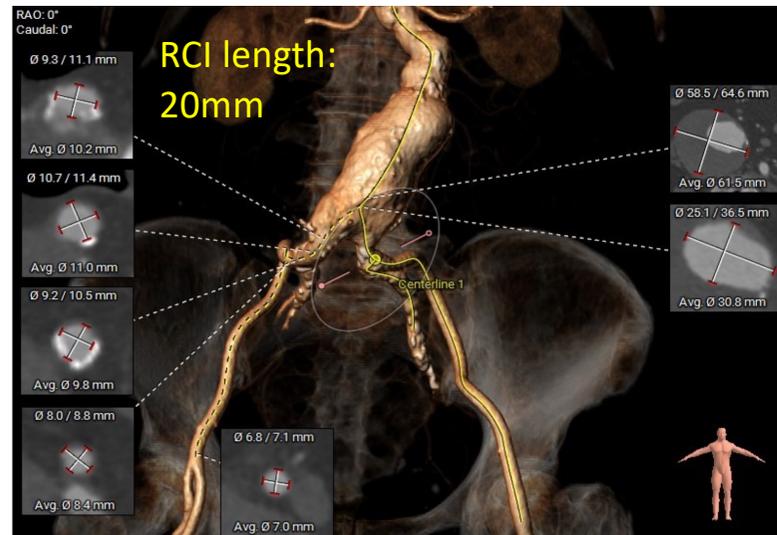
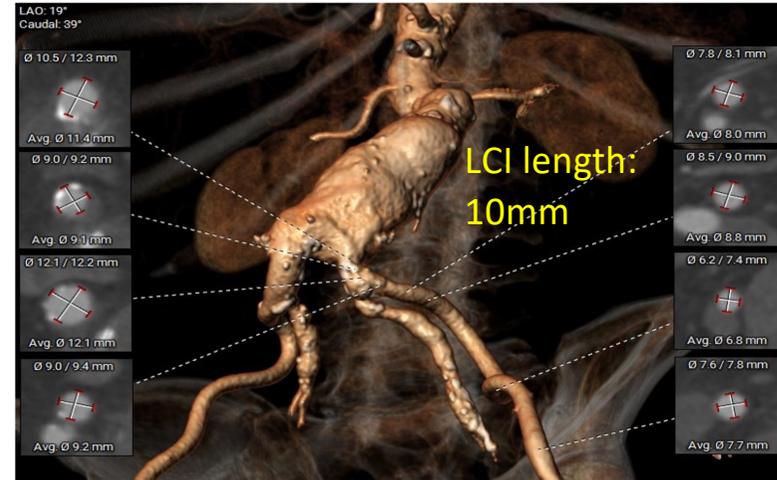
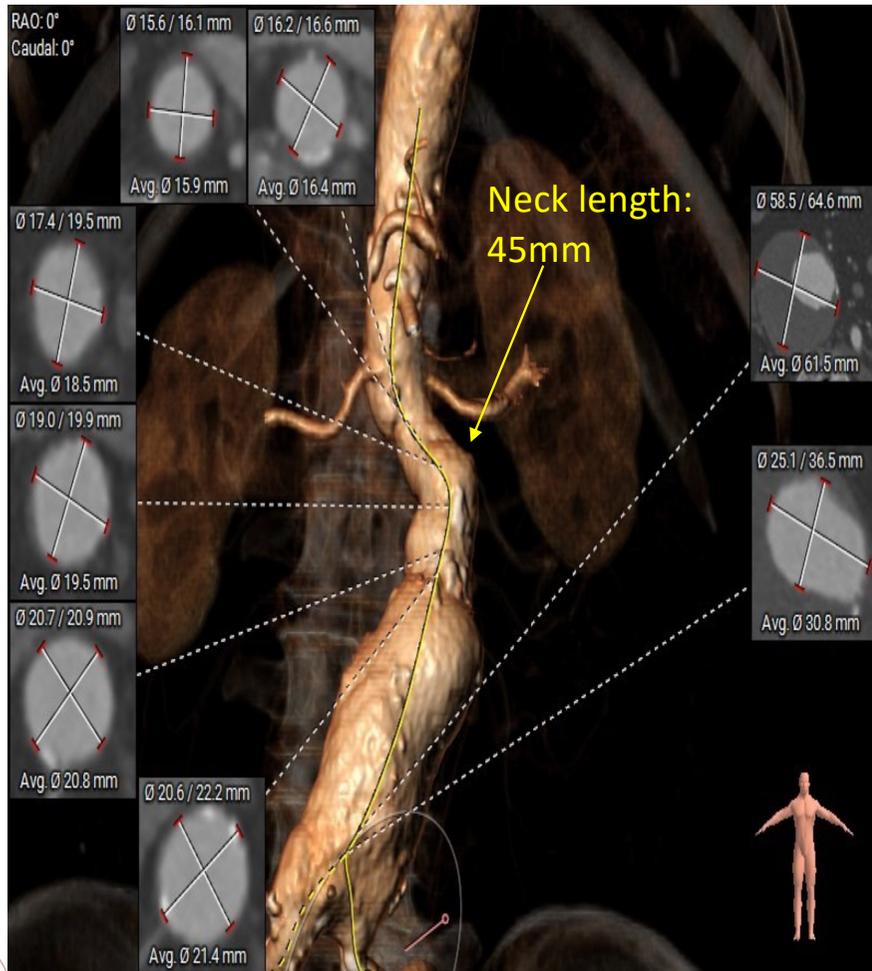
- Female, 75 yrs., Chief complaint: pained middle of the abdomen.
- History: hypertension.
- Examination:
 - Deep, constant pain in the belly area to back pain.
 - A pulse near the belly button with the aneurysm.



CT Scan

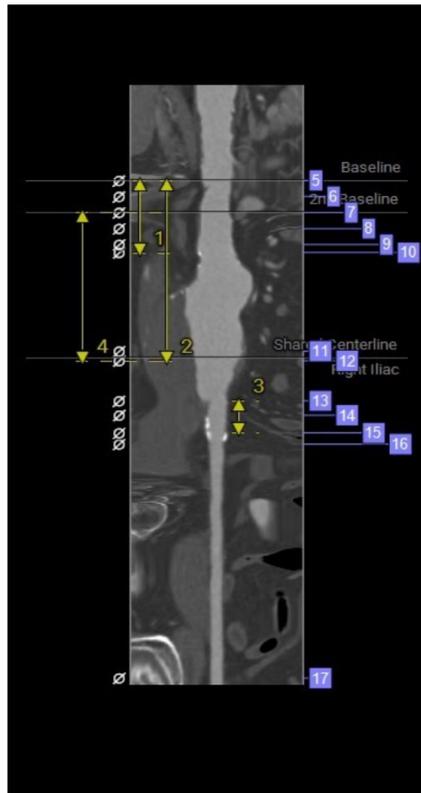


Measurement



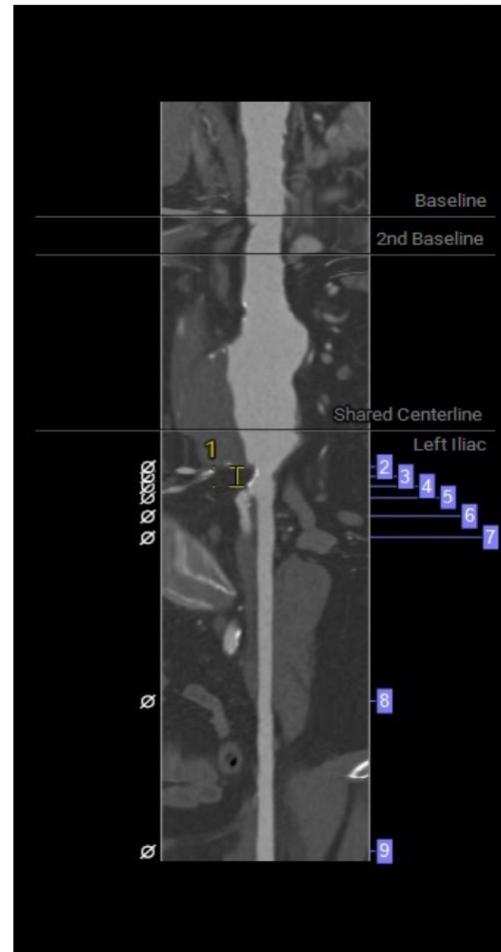
Plan

Stretched Vessel - Right Iliac		
ID Type	Label	Value
1	Vessel Length Length 194	45.0 mm
2	Vessel Length Length 196	113.0 mm
3	Vessel Length Length 198	20.0 mm
4	Vessel Length Length 204	93.0 mm



Diameters		
ID Distance	Label	Value
5	0.0 mm Min. Ø	16.2 mm
	Max. Ø	16.6 mm
	Avg. Ø	16.4 mm
6	10.0 mm Min. Ø	15.6 mm
	Max. Ø	16.1 mm
	Avg. Ø	15.9 mm
7	20.0 mm Min. Ø	17.4 mm
	Max. Ø	19.5 mm
	Avg. Ø	18.5 mm
8	30.0 mm Min. Ø	19.0 mm
	Max. Ø	19.9 mm
	Avg. Ø	19.5 mm
9	40.0 mm Min. Ø	20.7 mm
	Max. Ø	20.9 mm
	Avg. Ø	20.8 mm
10	45.0 mm Min. Ø	20.6 mm
	Max. Ø	22.2 mm
	Avg. Ø	21.4 mm
11	107.0 mm Min. Ø	58.5 mm
	Max. Ø	64.6 mm
	Avg. Ø	61.5 mm
12	113.0 mm Min. Ø	25.1 mm
	Max. Ø	36.5 mm
	Avg. Ø	30.8 mm
13	138.0 mm Min. Ø	9.3 mm
	Max. Ø	11.1 mm
	Avg. Ø	10.2 mm
14	147.0 mm Min. Ø	10.7 mm
	Max. Ø	11.4 mm
	Avg. Ø	11.0 mm
15	158.0 mm Min. Ø	9.2 mm
	Max. Ø	10.5 mm
	Avg. Ø	9.8 mm
16	165.0 mm Min. Ø	8.0 mm
	Max. Ø	8.8 mm
	Avg. Ø	8.4 mm
17	311.0 mm Min. Ø	6.8 mm
	Max. Ø	7.1 mm
	Avg. Ø	7.0 mm

Stretched Vessel - Left Iliac		
ID Type	Label	Value
1	Vessel Length Length 199	10.0 mm



Diameters		
ID Distance	Label	Value
2	130.0 mm Min. Ø	10.5 mm
	Max. Ø	12.3 mm
	Avg. Ø	11.4 mm
3	135.0 mm Min. Ø	9.0 mm
	Max. Ø	9.2 mm
	Avg. Ø	9.1 mm
4	140.0 mm Min. Ø	12.1 mm
	Max. Ø	12.2 mm
	Avg. Ø	12.1 mm
5	146.0 mm Min. Ø	9.0 mm
	Max. Ø	9.4 mm
	Avg. Ø	9.2 mm
6	156.0 mm Min. Ø	7.8 mm
	Max. Ø	8.1 mm
	Avg. Ø	8.0 mm
7	167.0 mm Min. Ø	8.5 mm
	Max. Ø	9.0 mm
	Avg. Ø	8.8 mm
8	252.0 mm Min. Ø	6.2 mm
	Max. Ø	7.4 mm
	Avg. Ø	6.8 mm
9	330.0 mm Min. Ø	7.6 mm
	Max. Ø	7.8 mm
	Avg. Ø	7.7 mm

Comments:

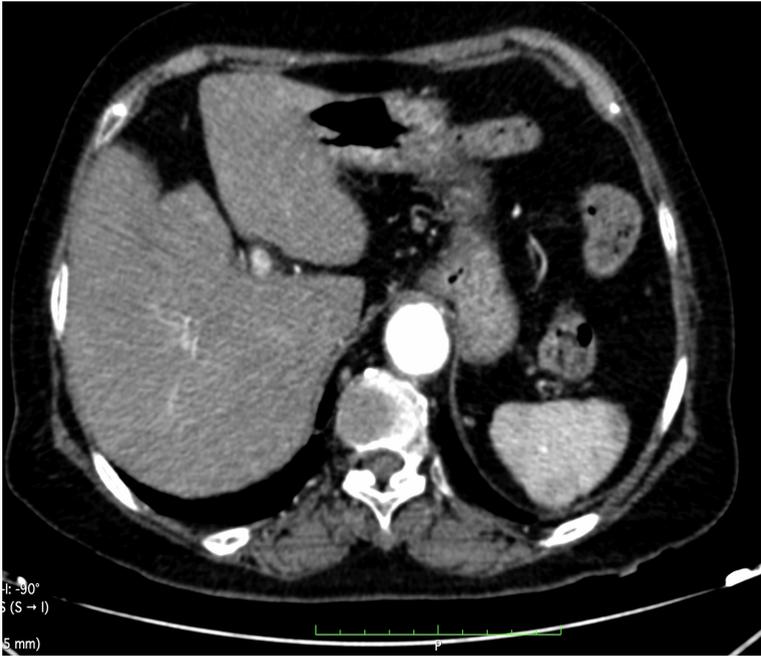
ENDOVASCULAR

Stent graft:

- Main: 25x14x103 mm
- R: 16x13x93 mm
- L: 16x10x124 mm
- Vas plug (LIIA):
Amplatz 10 mm



AFTER 6 MONTHS

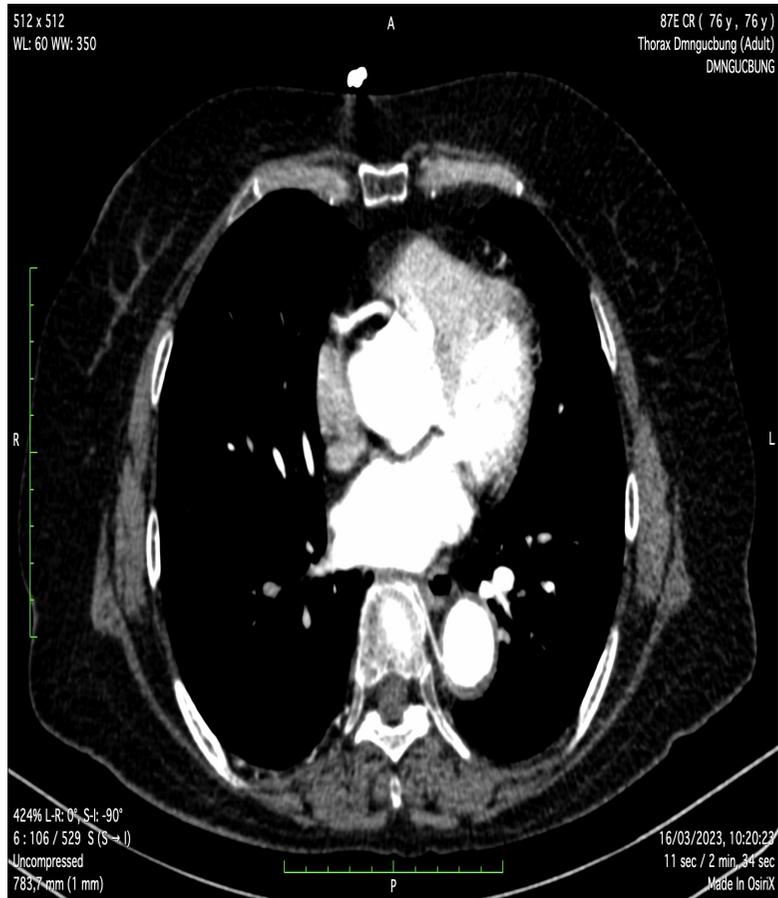


REINTERVENTION

- R: 16x10x156 mm
- Right internal iliac artery occlusion: open surgery



Post-Reintervention





DISCUSSION



- **Risk factors :**
 - Tortuosity of iliac axes.
 - Aneurysm sac > 65 mm in diameter.
- **Oversize:** 30% at R-CIA
- **Open repair:** do not routinely require open surgical repair.





CONCLUSION



- T1 Endoleaks can frequently be treated by secondary endovascular interventions.
- In addition, both treatment and prevention of T1 endoleaks have a high success rate, with low complication and endoleak recurrence.





THANK YOU FOR YOUR ATTENTION

