

Internal Iliac Artery Occlusion is unnecessary during EVAR

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Relevant Questions

1. Is it safe to sacrifice/overstent arteries?
 - Internal Iliac Artery (1 or 2)
2. Is it safe to preserve/revascularize these arteries?
 - Planning: delay
 - Intra-operative risks: OR time, technical
 - Late risks
3. If the answer to Q2 is „Yes“, should we not always revascularize?
 - Only in patients that would benefit....?

Is it safe to overstent 1 or 2 IIA's?

- Minimal adverse consequences

Rhee et al. Ann Vasc Surg 2002

- Bowel, Pelvic, and Spine ischemia
- Buttock claudication

Engelke et al. J Vasc Interv Radiology 2002

Clarke et al. Eur J Vasc Endovasc Surg 2001

Cynamon et al. J Vasc Interv Radiology 2000

Geraghty et al. J Vasc Surg 2004

→ *Physically Active patients*

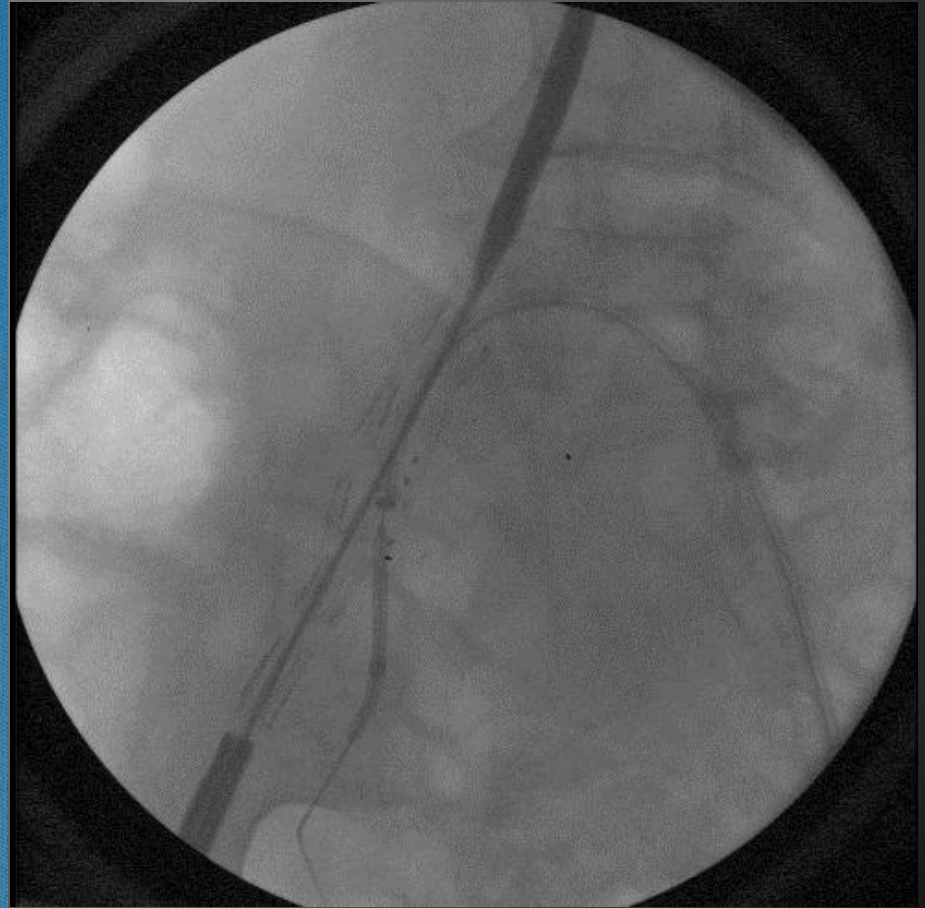
Risk (of intentional occlusion) higher with:

- Concomitant arteriosclerotic disease
 - Contralateral IIA
 - Ipsilateral Profunda femoris
- Contralateral occlusion
- Bilateral intentional occlusion of the IIA

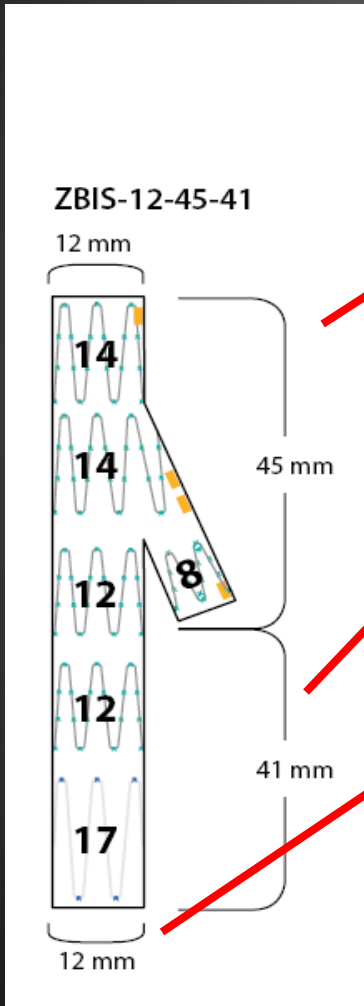
Yano et al. J Vasc Surg 2001

Iliopoulos et al. J Vasc Surg 1989

Device and Technique



Off-the-Shelf device (8 graft sizes)



Shortest possible body

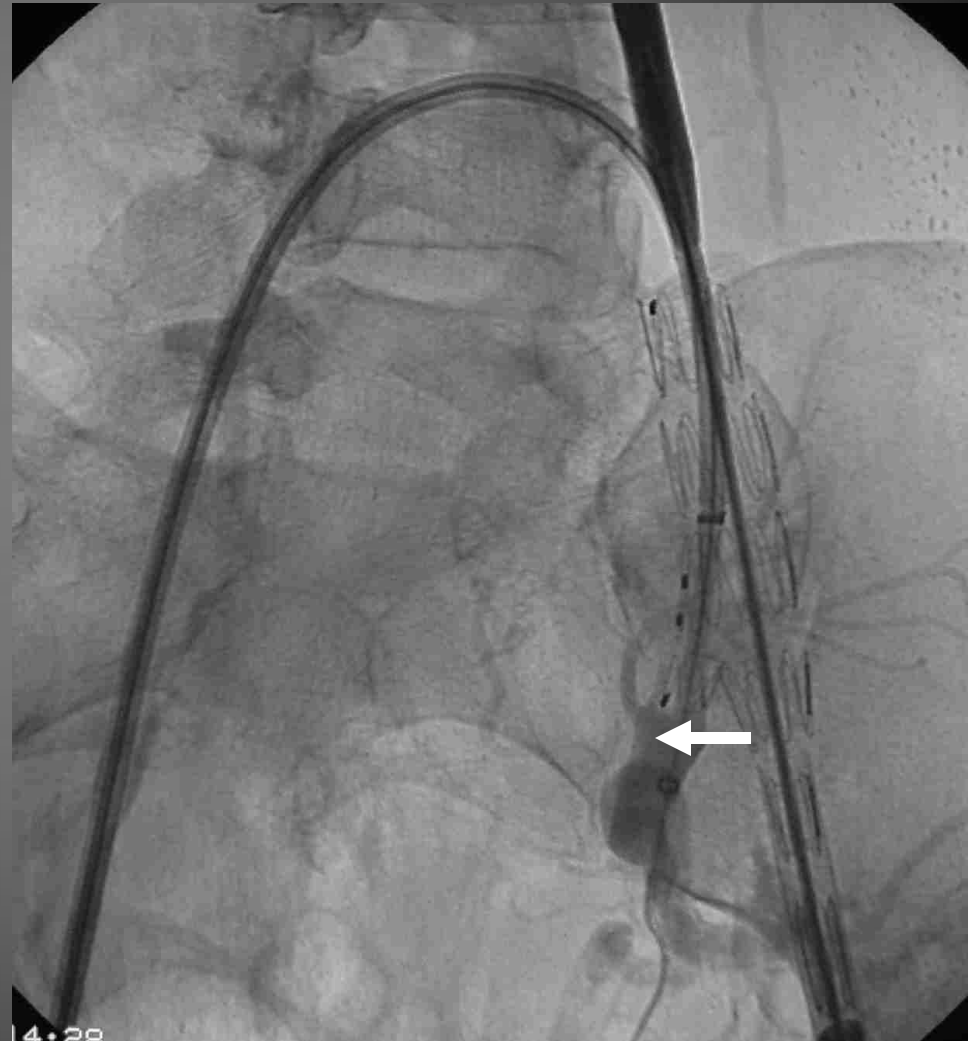
Two stents into the EIA

12mm EIA limb

→ No planning Delays

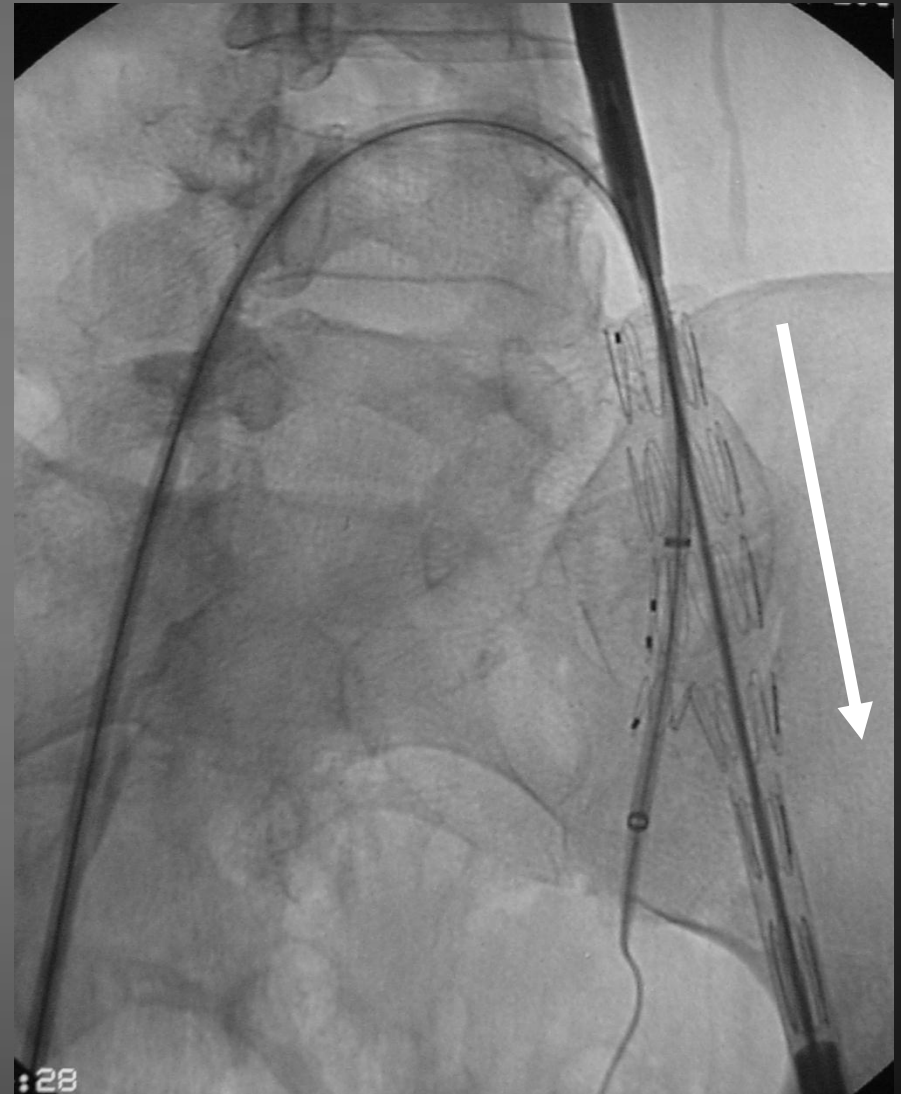
Groningen Technique

- Co-axial
- ANL-1 12F sheath in body IBD
- ANL-1 7F sheath through limb IBD
- Remove preloaded wire



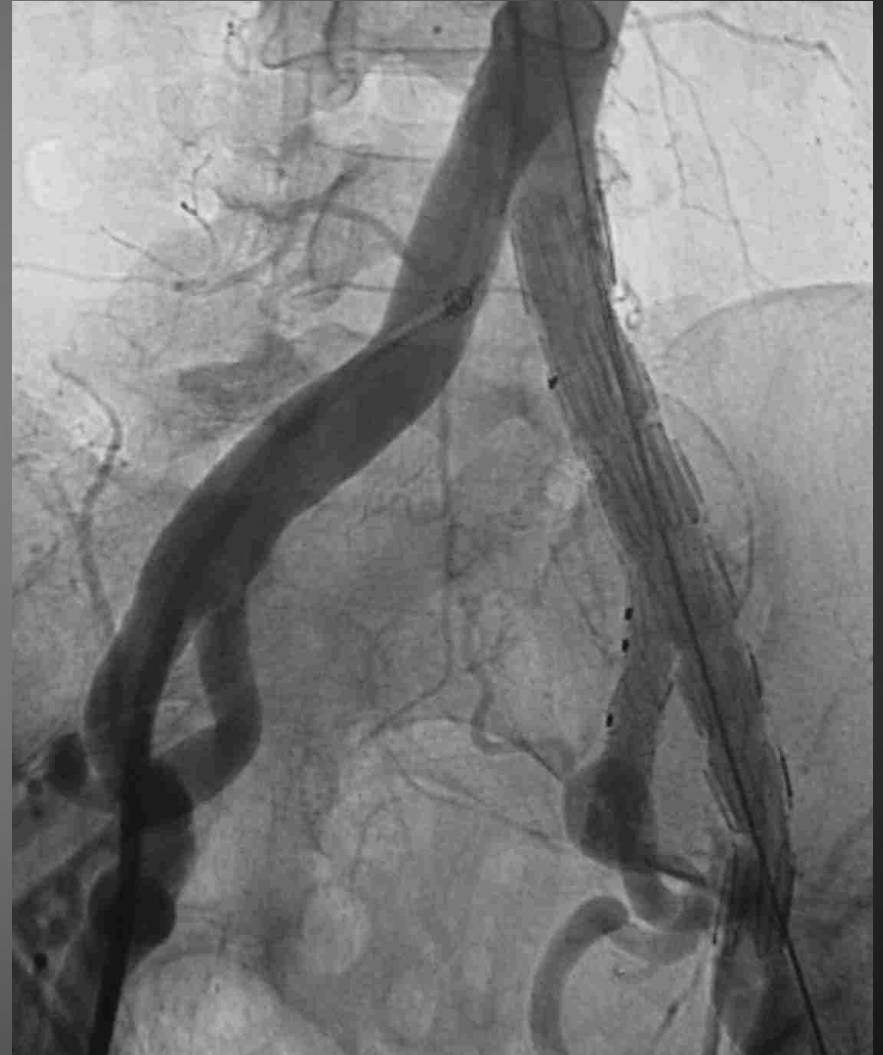
Groningen Technique

- Catheterisation of internal iliac artery
- Stiff wire
- Advance ANL-1 inside the internal iliac artery
- Pull down IBD to reduce the gap



Groningen Technique

- Insertion of bridging stent-graft (safe through the ANL)
- Deployment
- Ballooning



Intra-operative technical risks

- In experienced hands:
 - Expect 30' longer procedure
 - No other additional risks

Contra-indications (anatomical)

- Absolute
 - Internal Iliac artery aneurysm
 - Narrow diameter at level of iliac bifurcation
- Relative
 - Angle of IIA origin
 - Diseased IIA
 - Iliac tortuosity
 - Sharp aortic bifurcation
 - Short common iliac arteries

Implications of Failure

- Immediate/Direct
 - None (occlusion of IIA)
- Late/Indirect
 - Disconnection (Type III endoleak)
 - Occlusion External Iliac Artery....



Complications (in the past...)

	IBD	Occlusions (%)		Disconnections (%)
		IIA	EIA	
Malina	10	1 (10)	1 (10)	1 (10)
Haulon	53	9 (17)	3 (6)	0
Ziegler	46	18 (39)	?	2 (4)
Groningen	33	3 (9)	1 (3)	0

Lessons learned

1. Bridging stentgraft:
 - 16 mm diameter
 - 1.5 stent overlap prox & distal
2. Reline external iliac limb with SE stent in angulation
3. Reline the Atrium in angulation



Results

- Tielliu, Verhoeven et al. JCVS 2009
The role of branched endografts in preserving internal iliac arteries (n=30)
- Verzini, Cao et al. EJVES 2011
100 consecutive IBD cases

Tielliu, Verhoeven, et al.

- Prospective study: 59 AIA evaluated
 - 7 not considered for IBD
 - 25 not suitable for anatomical reasons
 - 27 (52% of evaluated) treated with 30 IBD
- Technical success: 29/30
- Surgical Mortality: 0
- Occlusions:
 - IIA: 3 (9%)
 - EIA: 0
- Disconnections: 0

Verzini, Cao et al.

- Registry: 100 consecutive cases
- Technical success: 95/100
- Surgical Mortality: 0
- Occlusions:
 - IIA: 7
 - EIA: 2
- Disconnections: 1 (iliac branch covered stent)

Conclusions

- Indication
 - Type D aorto-iliac AAA (with impaired collateral flow?)
- Contra-indication
 - Unsuitable IIA
- High Technical success
- Evolution
 - Thinner and more flexible stent-graft limbs (in EIA)
 - Zenith Low profile and flex limbs
 - More flexible bridging stent-grafts
 - New Atrium OTW

Benefits

- Safe way to try to preserve a vessel with a branched graft
- Model for branched grafts
- Only totally Endovascular option

→ Fairly Liberal Use of IBD in active Patients

