

Iliac Branched Grafting

Tips & Tricks



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Disclosures

- William Cook Europe/Cook Inc.
 - Consultant & Research Grants
- Atrium
 - Consultant
- *Siemens*
 - *Consultant*
- *Gore*
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Why to preserve an IIA?
(with an IBD)

Unilateral and bilateral hypogastric artery interruption during aortoiliac aneurysm repair in 154 patients: a relatively innocuous procedure.

Mehta M¹, Veith FJ, Ohki T, Cynamon J, Goldstein K, Suggs WD, Wain RA, Chang DW, Friedman SG, Scher LA, Lipsitz EC.

- 154 pts
 - Bilateral/Unilateral IIA Interruption
 - No buttock necrosis, colon ischemia, death
 - Buttock claudication in 12%
 - Bilateral vs Unilateral IIA Interruption (NS difference)
- IIA Interruption: relatively benign?

Buttock claudication and erectile dysfunction after internal iliac artery embolization in patients prior to endovascular aortic aneurysm repair.

Rayt HS¹, Bown MJ, Lambert KV, Fishwick NG, McCarthy MJ, London NJ, Sayers RD.

- 18 Studies, 634 pts
 - Bilateral/Unilateral IIA Interruption
- Buttock claudication: 28%
 - After unilateral IIA interruption: 31%
 - After bilateral IIA interruption: 35% (NS)
- Erectile dysfunction: 17%

→ IIA Interruption not really benign...

Outcome after Interruption or Preservation of Internal Iliac Artery Flow During Endovascular Repair of Abdominal Aorto-iliac Aneurysms

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Eur J Vasc Endovasc Surg (2016) ■, 1–14

- Systematic review
- 57 Articles
 - 30 on IIA Interruption (1468 pts)
 - 27 on IIA Preservation (816 pts)

Conclusion: Unilateral or bilateral IIA occlusion during EVAR seems to carry a substantial risk of significant ischemic complications in nearly one quarter of patients. Bilateral IIA occlusion was related to a significantly higher rate of BC. IIA preservation techniques represent a significant improvement in the treatment of aorto-iliac

*Decision-making and techniques
in hypogastric artery revascularization*

P. GEISBÜSCH¹, N. ATTIGAH¹, A. HYHLIK-DÜRR¹, M. HAKIMI¹, M. MÜLLER-ESCHNER², D. BÖCKLER¹

IIA Preservation

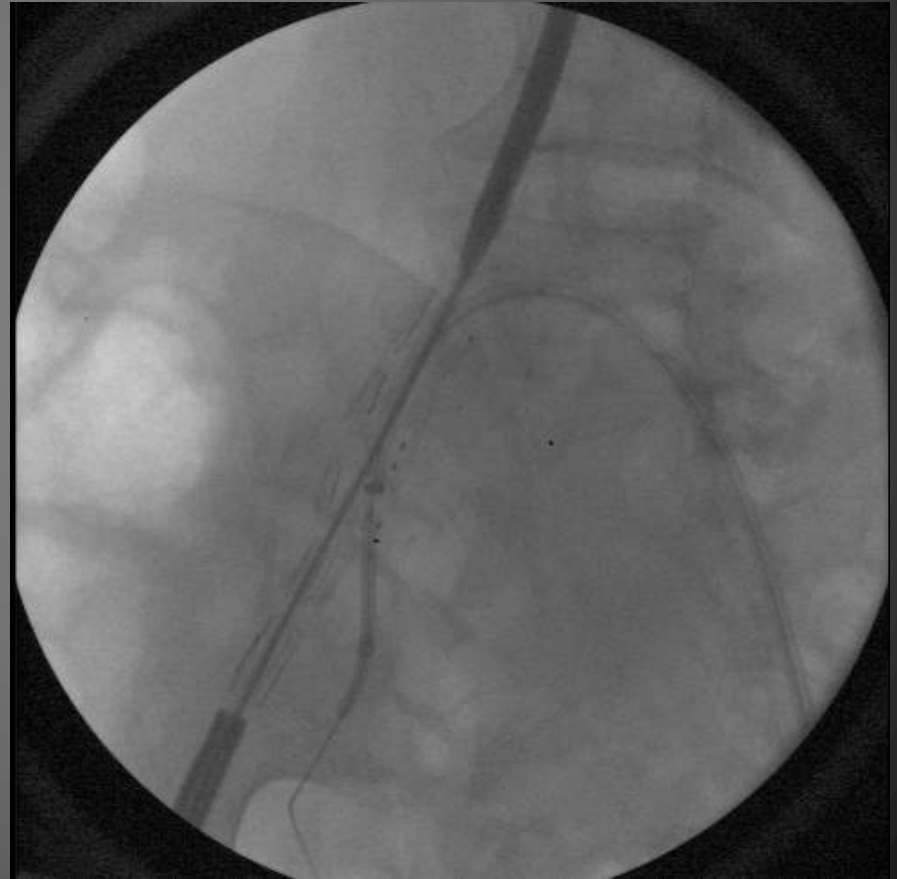
- Young, physically & sexually active pts
- Contralateral IIA stenosis/occlusion
- Previous TAAA surgery (↑ paraplegia risk)
- Impaired collateral circulation from IMA

Bilateral IIA Preservation



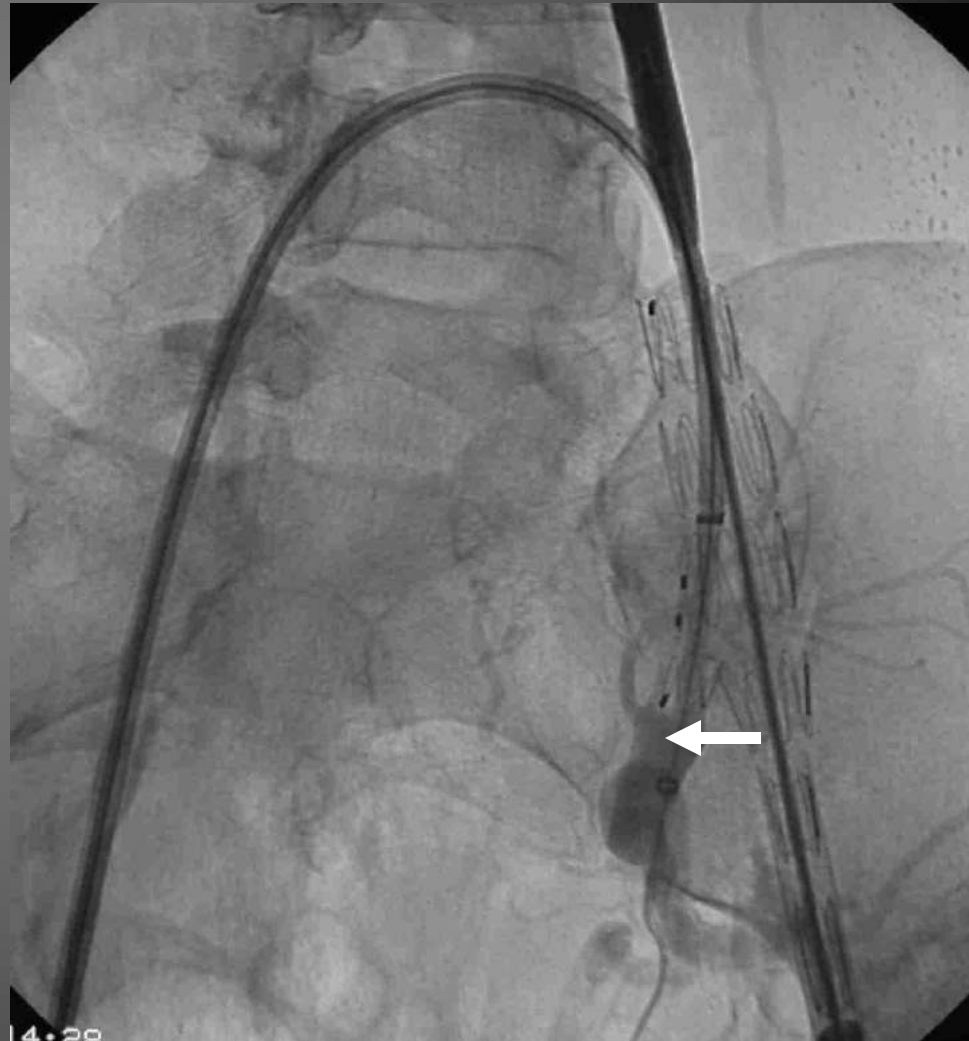
- No established indications...
 - Indication discussed before?
 - Why not?
 - Do both in the hope to save one?

Iliac Branched Device (IBD) Cross-Over Technique



Cross-over Technique

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



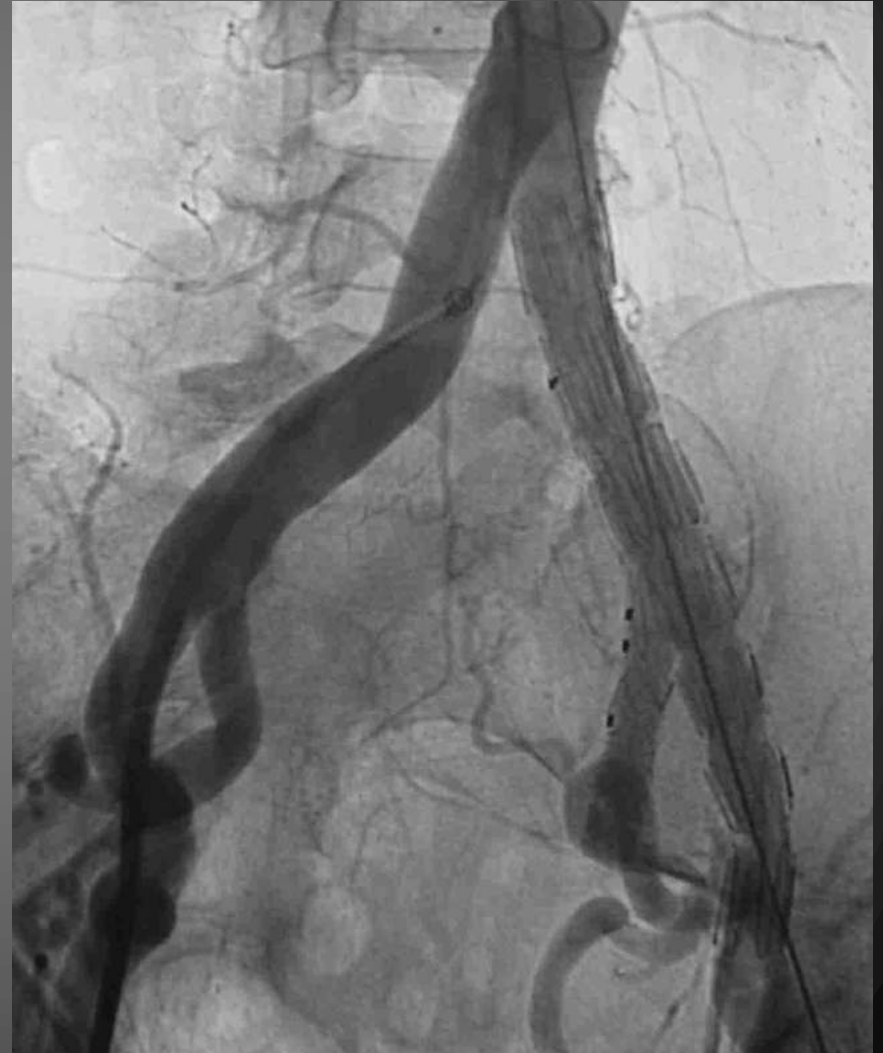
Cross-over Technique

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



Cross-over Technique

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



Alternative Technique

- Axillary Access
 - Prior EVAR
 - Short CIA
 - Sharp aortic bifurcation



Bilateral IBD Technique Options

- Femoral Access
 - Via X-over (x2)



Bilateral IBD Technique Options

- Axillary Access
 - Previous EVAR
 - Short CIA
 - Sharp aortic bifurcation



Bilateral IBD Technique

Axillary Access

- Extra Requirements
 - Stable upper access
 - (12F ANL)
 - Long Sheath 7F/8F
 - Longer catheters/shafts
 - Bridging Stents
 - Balloons



IBD Technique

Anatomical Contraindications

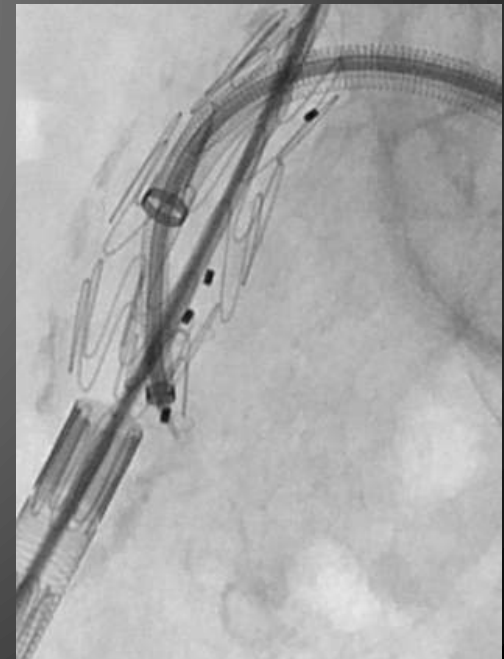
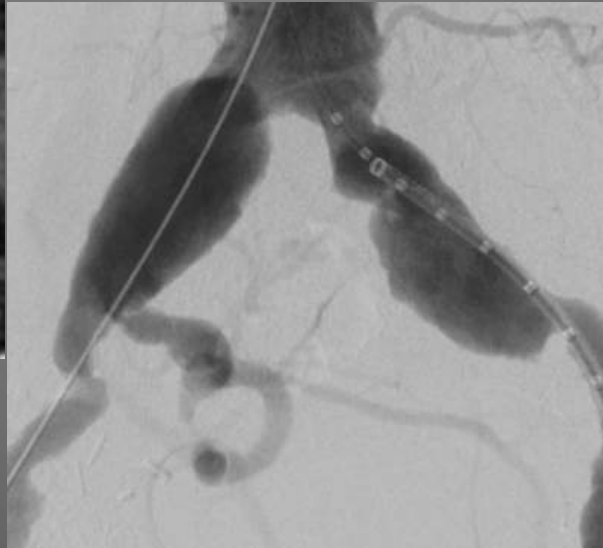
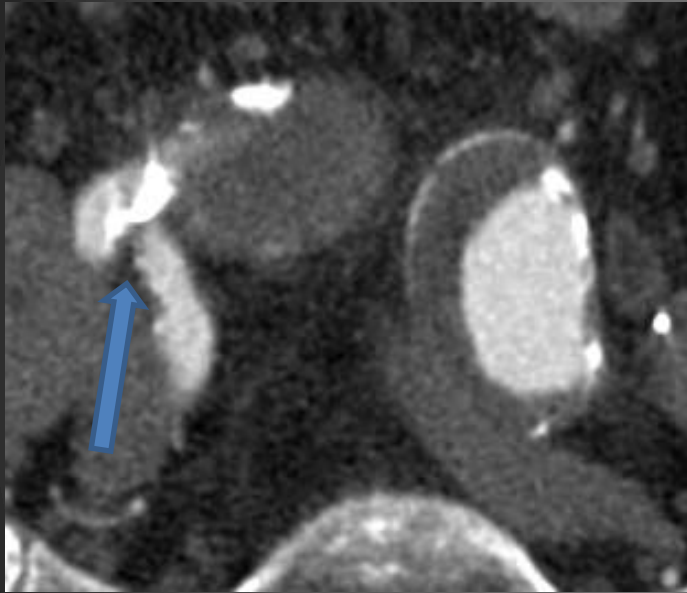
- Absolute
 - Aneurysm of the IIA
 - Narrow diameter at level of iliac bifurcation
- Relative (not with upper access)
 - Sharp aortic bifurcation
 - Short CIAs
 - Previous EVAR

IBD Nuremberg Series

- January 2010 – September 2017
- 124 IBDs, 95 pts
 - 29 Bilateral IBDs
- Perioperative Outcomes
 - 30d Mortality: 0
 - Technical Success: 119/124 (96%)
 - 4 IIA Catheterisation Failures, 1 IIA Branch Occlusion

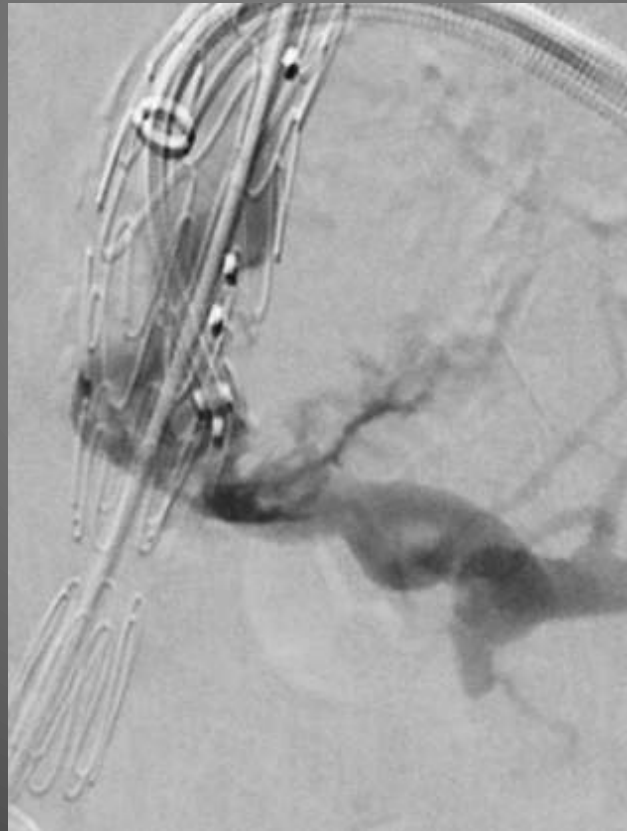
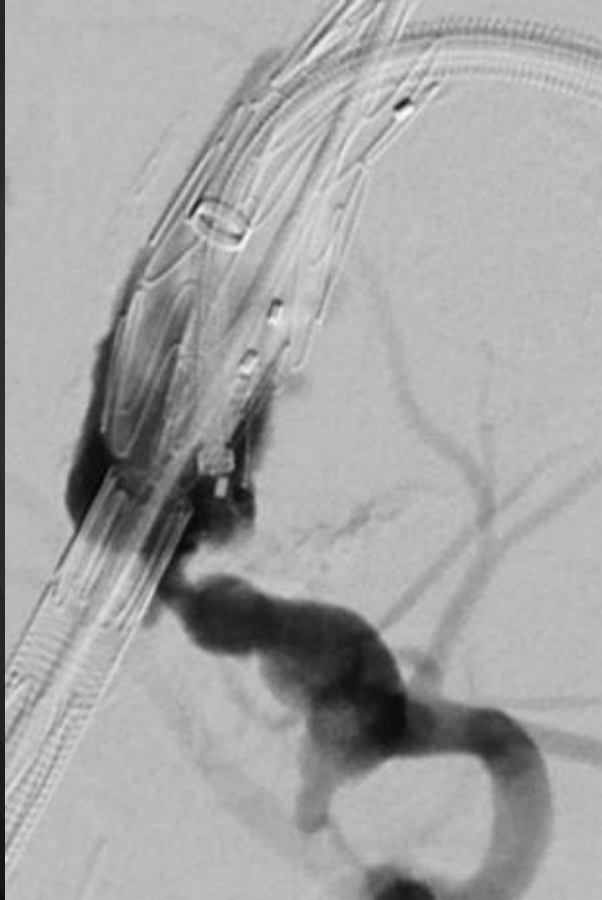
Catheterization Failure

Calcified-stenosed IIA origin - Narrow iliac bifurcation



Catheterization Failure

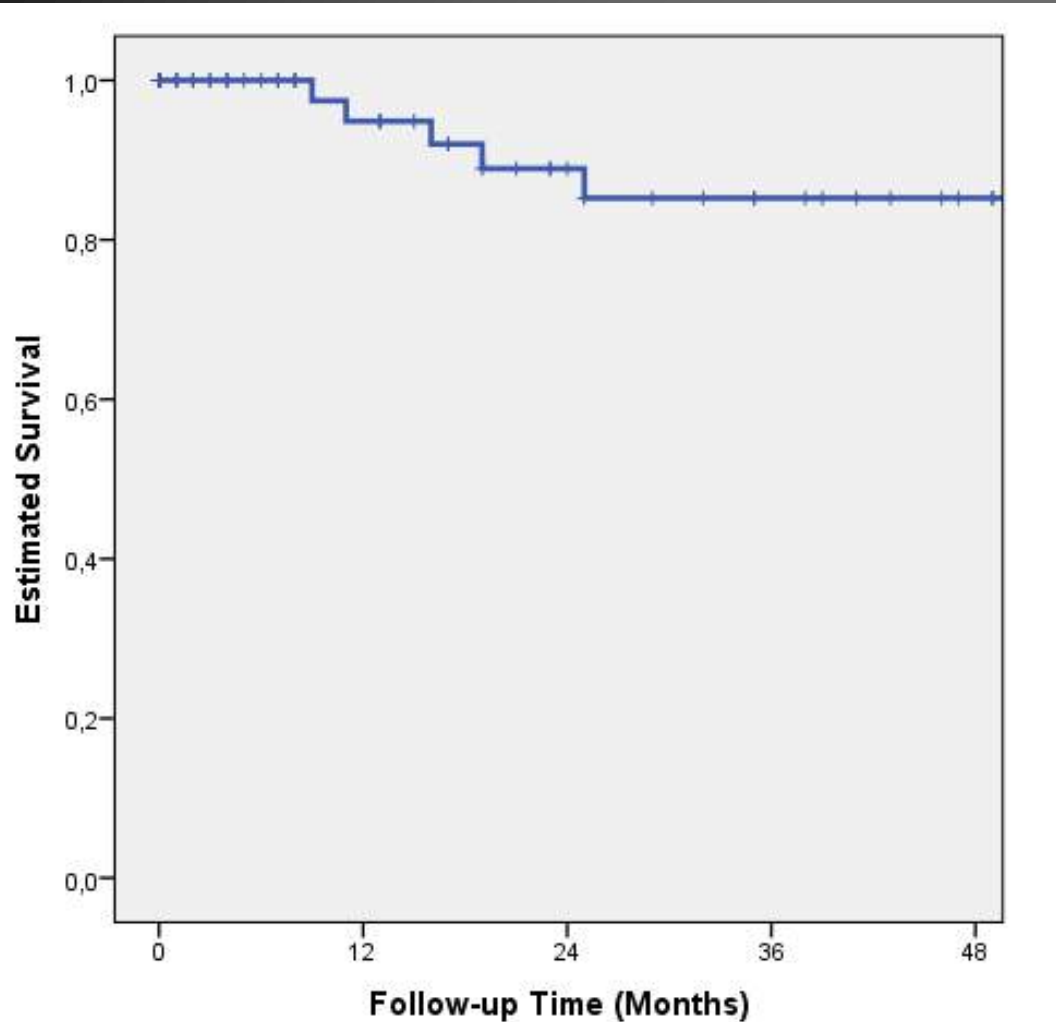
Calcified-stenosed IIA origin - Narrow iliac bifurcation



Follow-up

Mean: 18.3 ± 15 months

Survival



- 96.8% \pm 2.2% @ 1 year
- 90.3% \pm 4.2% @ 3 years

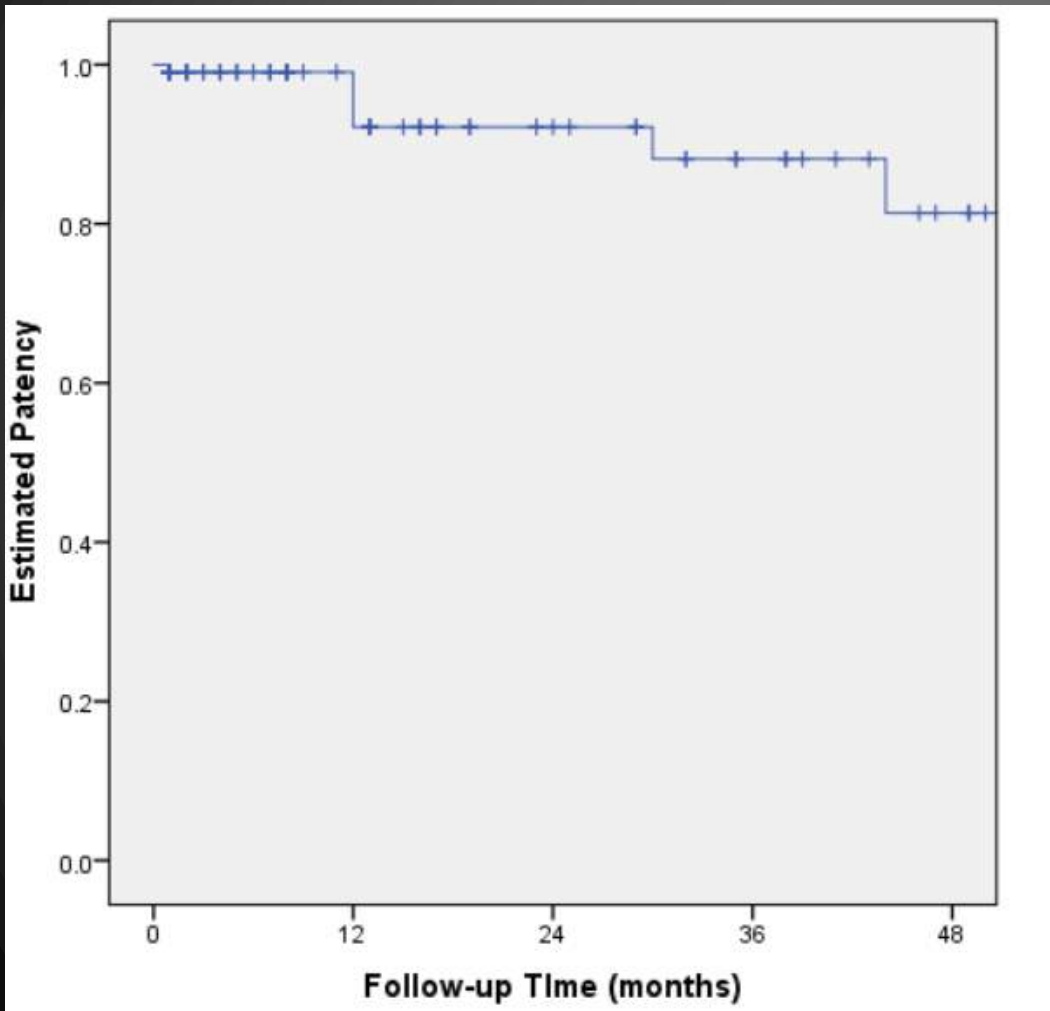
No IBD Related Mortality

IIA Branch Occlusion

- N=6 (4.8%)
 - All asymptomatic

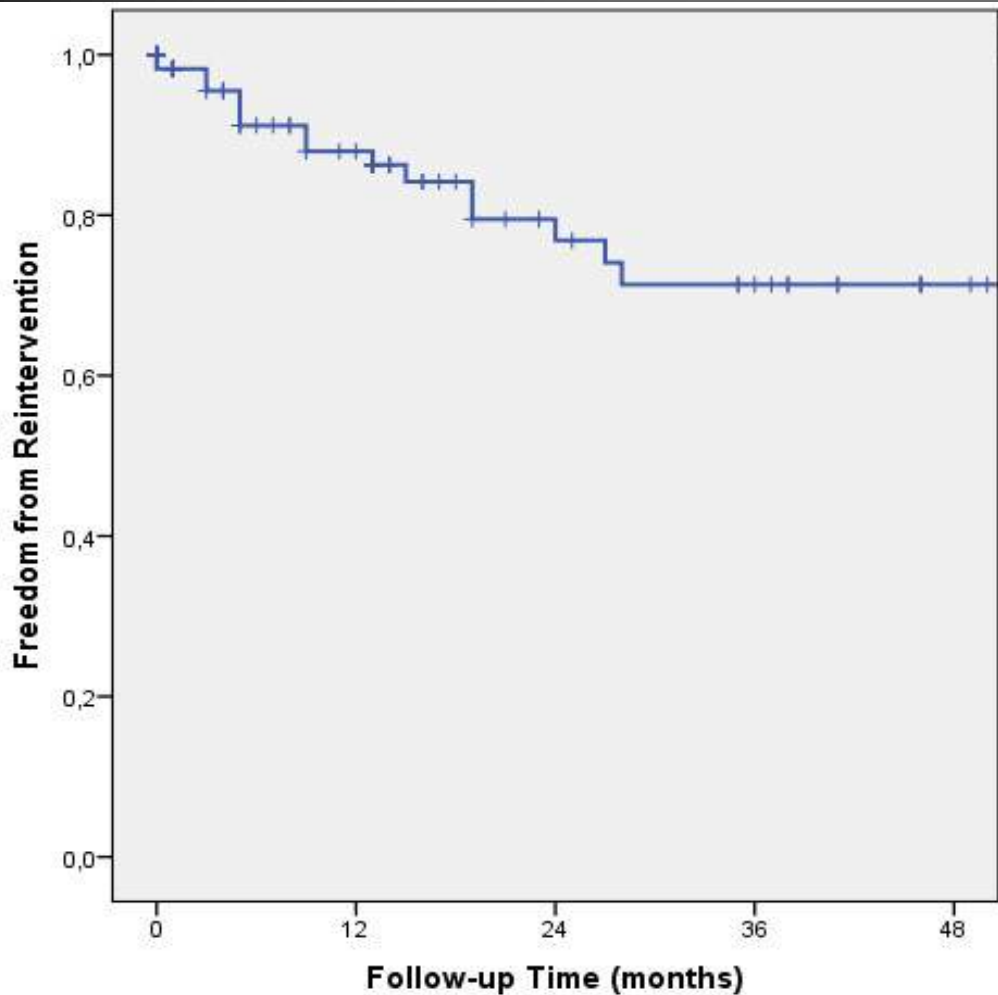


IIA Branch Patency



- $95.8\% \pm 3.1\%$ @ 1 year
- $84.7\% \pm 6.9\%$ @ 3 years

Freedom from Reintervention



- $88\% \pm 3.9\%$ @ 1 year
- $71.4\% \pm 6.6\%$ @ 3 years

Reinterventions

- N=11 (8.9%)
 - EIA Relining: N=4
 - IIA Stent Extension/Relining: N=4
 - 3 Type Ib Endoleak, 1 Type III Endoleak
 - EIA Thrombectomy: N=2
 - Fem-Fem Bypass: N=1
 - Occlusion EIA

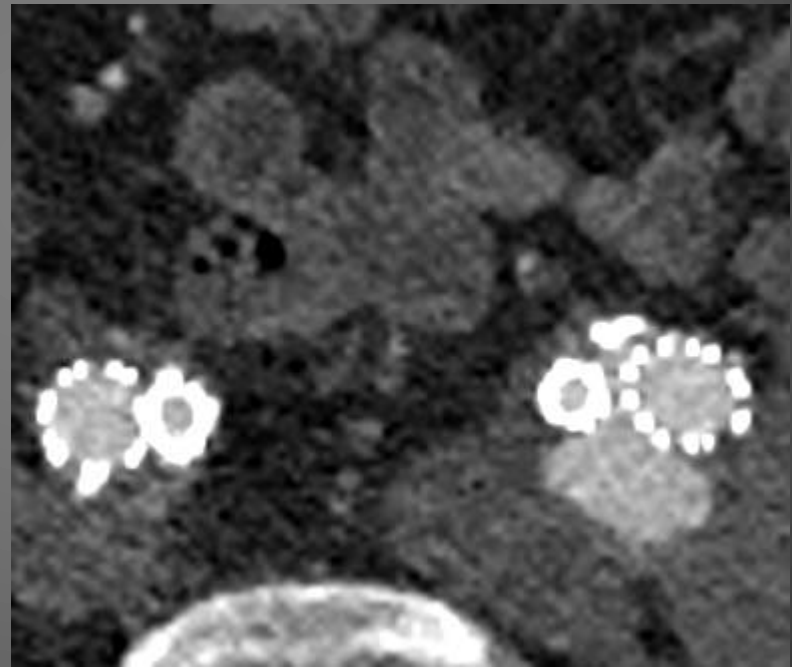
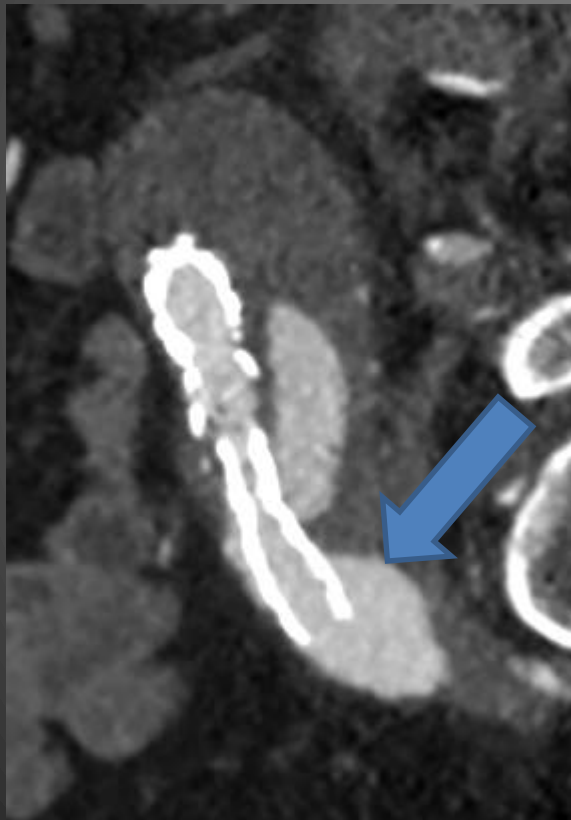
Bilateral IBD Nuremberg Series

- 29 pts with Bilateral IBD (Axillary access in 12 pts)
 - Bilateral IBD in 1 Stage: N=24
 - Second IBD later: N=5
- Early Outcomes
 - 30d Mortality: 0
 - Overall Technical Success: 55/58 (95%)
 - 2 IIA Catheterisation failures, 1 IIA Branch Occlusion

Bilateral IBD Nuremberg Series

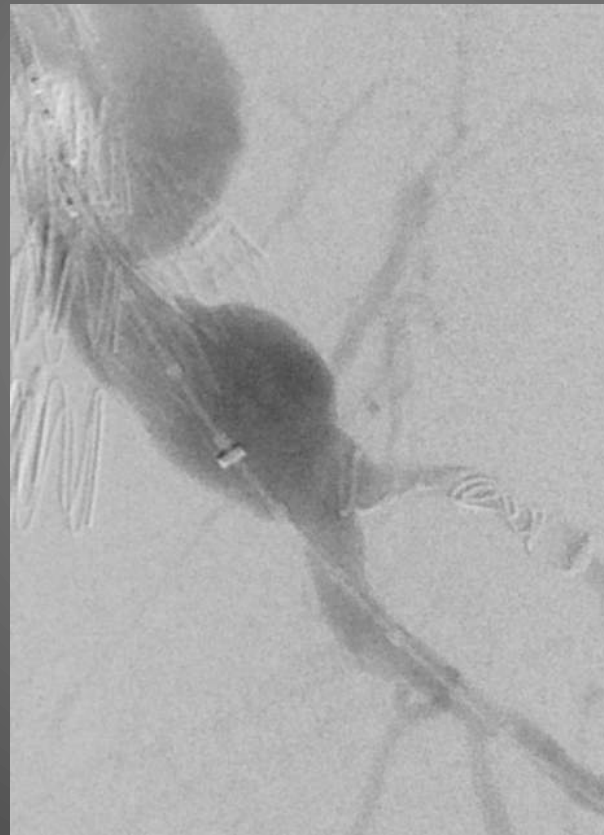
- Late Events: N=6
 - IIA Branch occlusion: N=4
 - Unilateral: N=2
 - Bilateral: N=1
 - Endoleak: N=2
 - Extension (Advanta V12)
 - Extension in IIA branch + coiling second branch
- Remark: all 3 patients with occlusion asymptomatic...

Endoleak



Endoleak Treatment

Extension + IIA Branch coiling (Axillary Access)



Literature

Long-term Results of Iliac Aneurysm Repair with Iliac Branched Endograft:
A 5-Year Experience on 100 Consecutive Cases[☆]

G. Parlani^a, F. Verzini^a, P. De Rango^{a,*}, D. Brambilla^a, C. Coscarella^b, C. Ferrer^b, P. Cao^b

^aUnit of Vascular and Endovascular Surgery, Hospital S. Maria della Misericordia, Perugia, Italy

^bUnit of Vascular Surgery, Hospital S. Camillo-Forlanini, Rome, Italy

European Journal of Vascular and Endovascular Surgery 43 (2012) 287–292

- 2006-2011, 2 Centers (Italy)
- 100 pts with unilateral IBD
 - Technical success: 95%
 - 30-day mortality: 0

Follow-up

Median 21 months (1-60 months)

- Iliac Endoleak: N=3 (3%)
- IIA branch patency:
 - 91.4% at 1 and 5 years
 - Buttock claudication: N=4 (4%)
- Freedom from Reintervention
 - 90% at 1 year, 81.4% at 5 years
 - IBD: Persistent Aneurysm Exclusion in 5 years
 - Low need for Reintervention (?)

Literature

[J Endovasc Ther.](#) 2016 Nov 17. pii: 1526602816679132. [Epub ahead of print]

Endovascular Treatment of Common Iliac Artery Aneurysms With an Iliac Branch Device: Multicenter Experience of 140 Patients.

[Jongsma H¹](#), [Bekken JA²](#), [Bekkers WJ²](#), [Zeebregts CJ³](#), [van Herwaarden J⁴](#), [Hoksbergen A⁵](#), [Cuypers P⁶](#), [de Vries JP⁷](#), [Verhagen HJ⁸](#), [Fioole B²](#).

- 2004-2015, 7 Centers (The Netherlands)
- 140 patients, 162 IBDs
 - Technical success: 96.9%
 - 30-day mortality: 1.4%

Follow-up

Mean 26.6 ± 24.1 months

- IIA branch Occlusion: N=15 (9.3%)
 - Buttock claudication: N=6 (3.7%)
- Reinterventions: N=17 (12.1%)
- Freedom from Reintervention
 - 75.9% (95% CI 59.7%- 86.3%) at 5 years

→ IBD: Safe & Effective

→ Need for Reintervention in >10%, mostly endovascular

ESVS2016-1665

Lesson Learned with the Use of Iliac Branch Devices: 10 Year Results in 150 Consecutive Patients

G. Parlani ^{1,*}, G. Simone ¹, L. Farchioni ¹, G. Isernia ¹, E. Cieri ¹,
M. Lenti ¹, P. Cao ², F. Verzini ¹

¹ *Unit of Vascular Surgery, Santa Maria della Misericordia Hospital, University of Perugia, Perugia, Italy*

² *GVM Research and Care, Cotignola and Rome, Italy*

- 2006-2016, 2 Centers (Italy)
- 150 pts, 155 procedures
 - 133 Cook IBD, 22 Gore IBE
 - Technical success: 96%
 - 30-day mortality: 0


Follow-up

Mean 41.6 ± 3.6 months

- Iliac Endoleak: N=7 (4.5%)
- IIA branch patency:
 - 93.3% at 5 years, 89.2% at 10 years
- Freedom from Reintervention
 - 82.7% at 5 years, 69.8% at 10 years
- No Rupture, No related Mortality
 - IBD: High Patency Rates up to 10 years
 - Need for Reintervention

Secondary Procedures Following Iliac Branch Device Treatment of Aneurysms Involving the Iliac Bifurcation: The pELVIS Registry

Konstantinos P. Donas, MD^{1,2}, Mirjam Inchingolo, MD^{1,2}, Piergiorgio Cao, MD³, Carlo Pratesi, MD⁴, Giovanni Pratesi, MD⁵, Giovanni Torsello, MD^{1,2}, Georgios A. Pitoulis, MD, PhD⁶, Ciro Ferrer, MD³, Gianbattista Parlani, MD⁷, and Fabio Verzini, MD⁷, on behalf of the pELVIS Registry collaborators

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- 2005-2015, 6 European Centers
 - 575 pts, 650 IBDs/IBEs
 - Mean radiological F/U: 29.8 ± 21.1 months
 - IIA Patency: 95.1% at 8 years
 - Freedom from reintervention (for occl. & Type I endoleak: 85.7% at 8 years
- IBD: ↓ Incidence of reintervention in mid-term

Conclusions

- IBD appears to work well in the longer term...
 - Good IIA Branch Patency
 - Low Endoleak rate
 - Late Mortality: not IBD related
 - Acceptable need for reintervention
 - Mostly Endovascular...
- IBD via axillary access frequently usefull...

Conclusions

Tips and Tricks

- Learn a Safe Technique
- Choose Suitable Internal Iliac Arteries!
 - Catheterization
 - Sealing
- Learn Axillary Approach
 - To overcome relative contra-indications
 - Bilateral IBD
- Reline (with SE Stent) where needed!