Management of the hypogastric artery during EVAR

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Disclosure of interest

Professional fees
Educational grants
Research grant

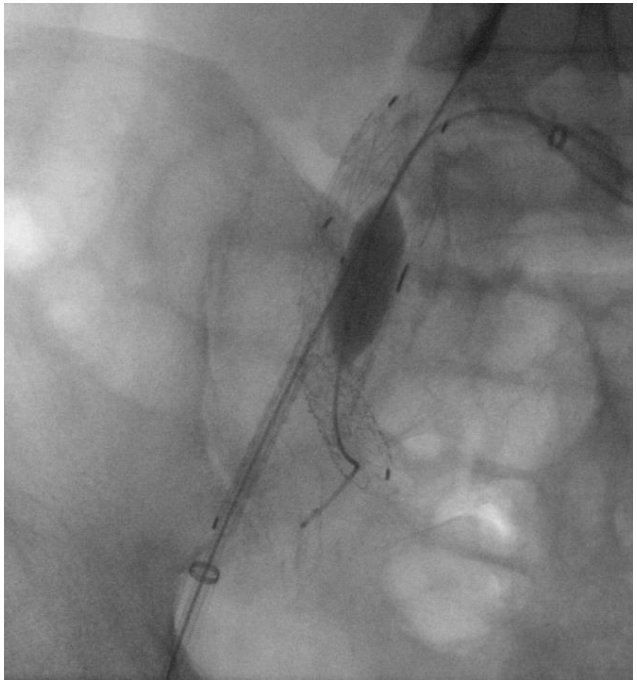
Case selection

Hypogastric coverage

with embolisation
without embolisation

Hypogastric preservation

Surgery
CIA landing
Branched iliac devices



What is the evidence?

LiVES

Hypogastric coverage

Advantages

(Almost) universally feasible

Technically simple in most cases

Cheap

Disadvantages

(Usually) irreversible

Complications

Buttock claudication

Sexual dysfunction
Type II endoleak
Colonic ischaemia
Buttock necrosis
Ischaemic lumbar plexopathy
Spinal cord ischaemia

Buttock claudication

After hypogastric coverage

Study/year [ref. no.]	No. of patients	Buttock claudication (%)	Sexual dysfunction (%)
Mehta 2001	107	17 (16)	7/73 (10)
Yano 2001	103	21 (20)	–
Rhee 2002	49	14 (29)	–
Schoder 2001	46	21 (46)	5/20 (25)
Criado 2000	39	5 (13)	–
Mehta 2004	32	5 (16)	2/18 (11)
Razavi 2000	32	9 (28)	2/16 (13)
Lee 2000	27	5 (19)	–
Lee 2001	23	9 (39)	–
Lyden 2001	23	7 (30)	–
Karch 2000	22	7 (32)	–
Kritpracha 2003	20	9 (45)	–
Wolpert 2001	18	8 (44)	–
Engleke 2002	16	4 (25)	–
Tefera 2004	13	4 (31)	–
Arko 2004	12	6 (50)	–
Linn 2002	12	6 (50)	5/11 (45)
Wyers 2002	11	5 (45)	–
Total	605	162/605 (27)	21/146 (14)

Rayt et al., 2008

LiVES

Claudication after hypogastric coverage

2008-2016

17 publications – sample size: 13-101

Early (n. = 729)	Persistent (n. = 741)
201 (28% - 95%CI = 25-31%)	**126** (17% - 95%CI = 14-20%)

No difference between:

coverage vs embolisation
coils vs vascular plugs
unilateral vs bilateral coverage

No QoL data

Hypogastric coverage

To embolise or not to embolise?

No need to embolise if

Distal CIA “landing zone”

Diseased hypogastric artery

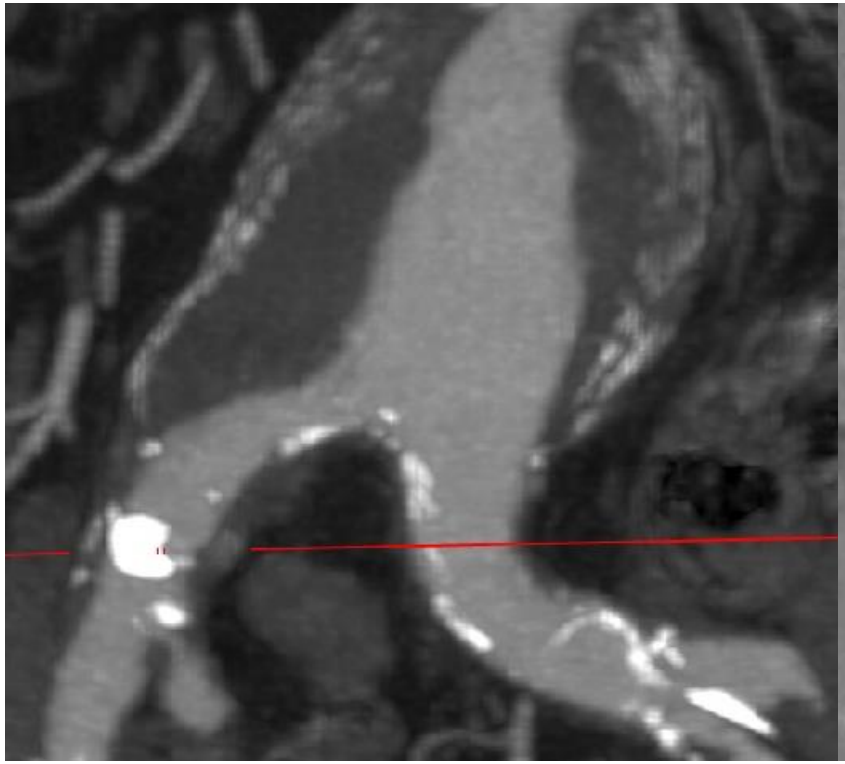
Ostial hypogastric stenosis

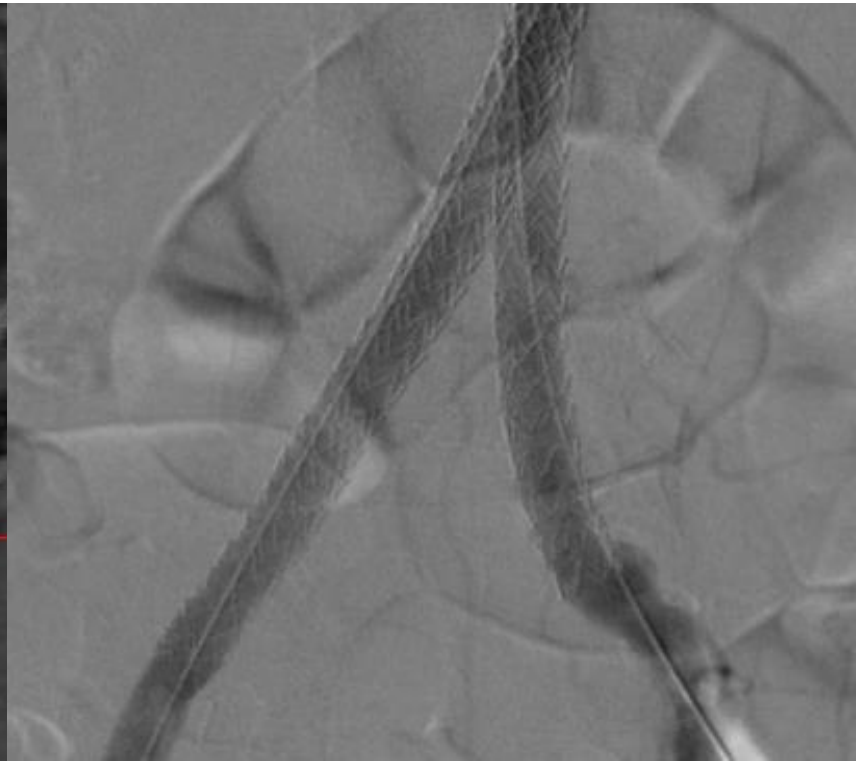
Sealing ring at CIA origin

Using Nellix

Hypogastric coverage

Nellix





Hypogastric preservation

External iliac to hypogastric bypass or transposition

Invasive

Universally available

Alternative to IBD/IBE

Not of historical interest only

Outcome after concomitant unilateral embolization of the internal iliac artery and contralateral external-to-internal iliac artery bypass grafting during endovascular aneurysm repair

Akihiro Hosaka, MD, Masaaki Kato, MD, Ippei Kato, MD, Shingo Isshiki, MD, and **Nobukazu Okubo, MD,** *Osaka, Japan*

JVS, 2011

Hypogastric preservation

CIA landing

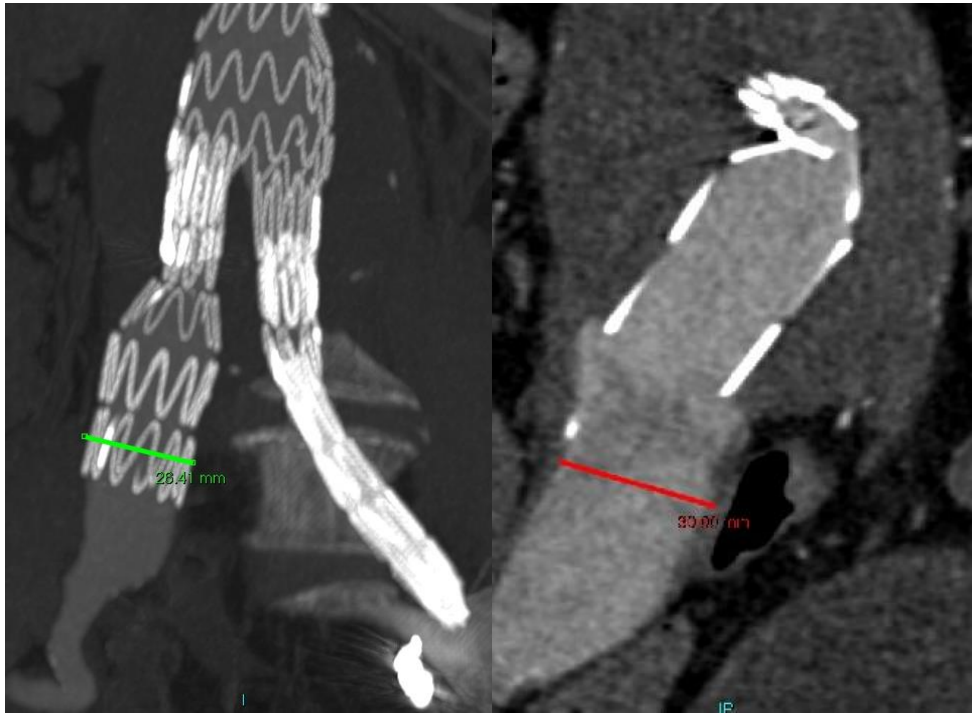
Easy and quick

On IFU for up to 35 mm CIA Ø (Nellix)

Increased risk of type Ib endoleak

Secondary intervention

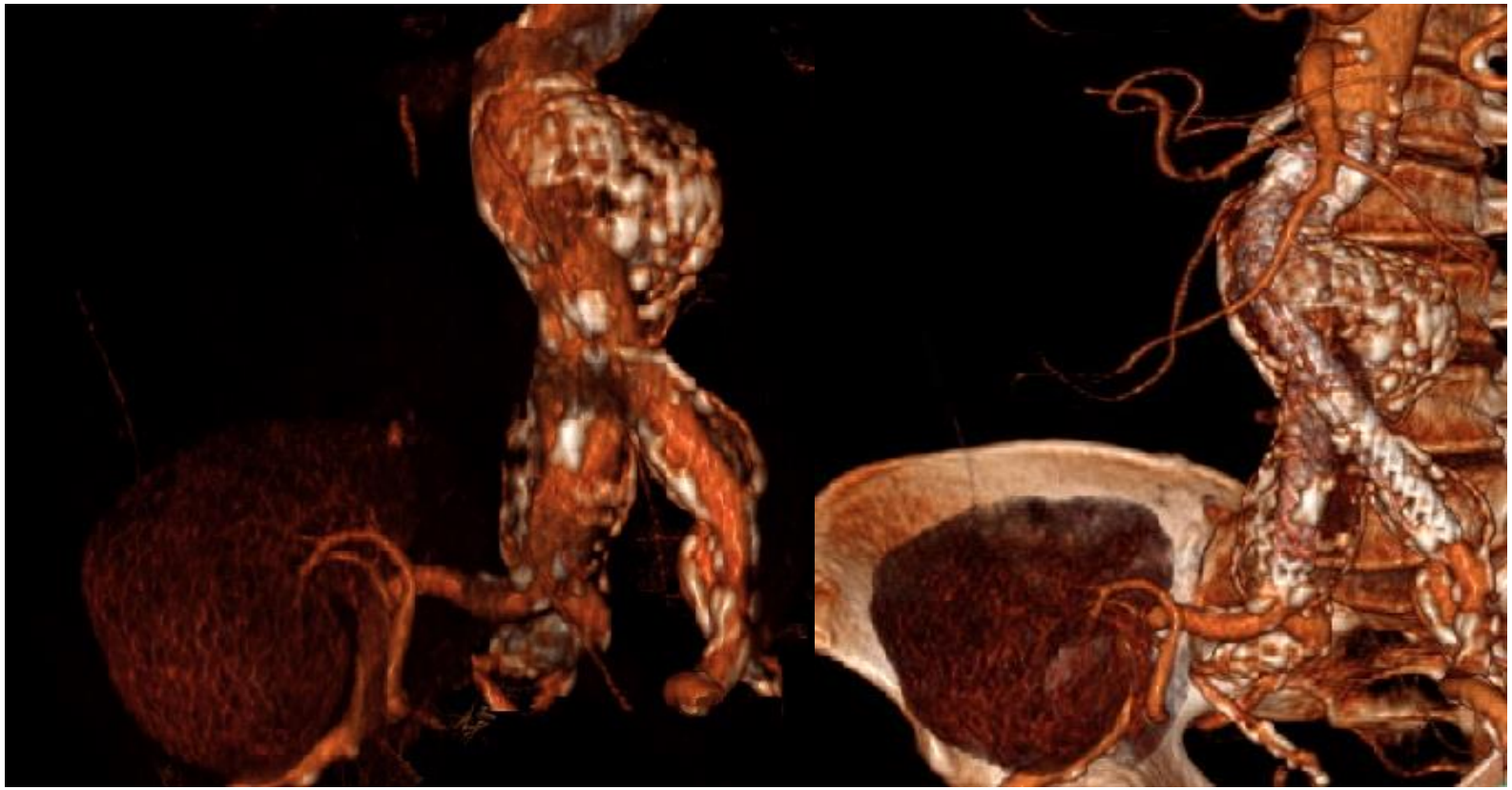
SGVI score: CIA diameter significant predictor of poor outcome



Karthikesalingam et al. BJS 2013
Hobo et al. JEVT, 2008

Hypogastric preservation

CIA landing



A deliberate compromise

Hypogastric preservation

Branched grafts

Hypogastric preservation

Iliac branched devices

Anatomical limitations

Narrow CIA lumen

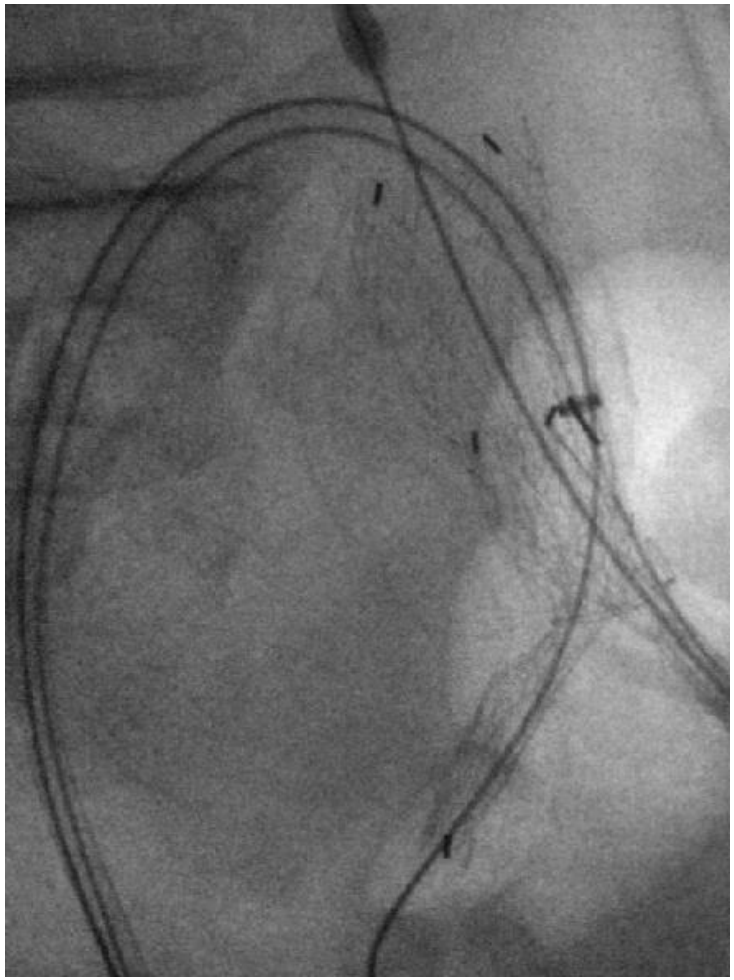
Lack of hypogastric landing zone

Short CIA

Tortuous EIAs

Only 20-60% of patients are suitable[1,2]

GORE IBE may have wider applicability than Cook ZBIS[2]



[1] *Gray et al., EJVES, 2015*
[2] *Pearce et al., Ann Vasc Surg 2015*

Hypogastric preservation

ZBIS iliac branched device (IBD)

Endovascular Aneurysm Repair with Preservation of the Internal Iliac Artery Using the Iliac Branch Graft Device

A. Karthikesalingam [a], R.J. Hinchliffe [a,*], P.J.E. Holt [a], J.R. Boyle [b], I.M. Loftus [a], M.M. Thompson [a]

EJVES, 2010

7 studies – 196 cases

Variable clinical and anatomical criteria
Technical success: 85-100%
Buttock claudication prevented in all but 1
3 endoleaks
5 EIA occlusions
12/24 late IBD occlusion (50% claudication)

Hypogastric preservation

ZBIS iliac branched device (IBD)

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]

EJVES, 2012

33 isolated iliac aneurysms
Technical success: 95%
No perioperative deaths
Follow up 1-60 months
Buttock claudicatio in 4
3 “iliac” endoleaks
2 x Ib
1 x III

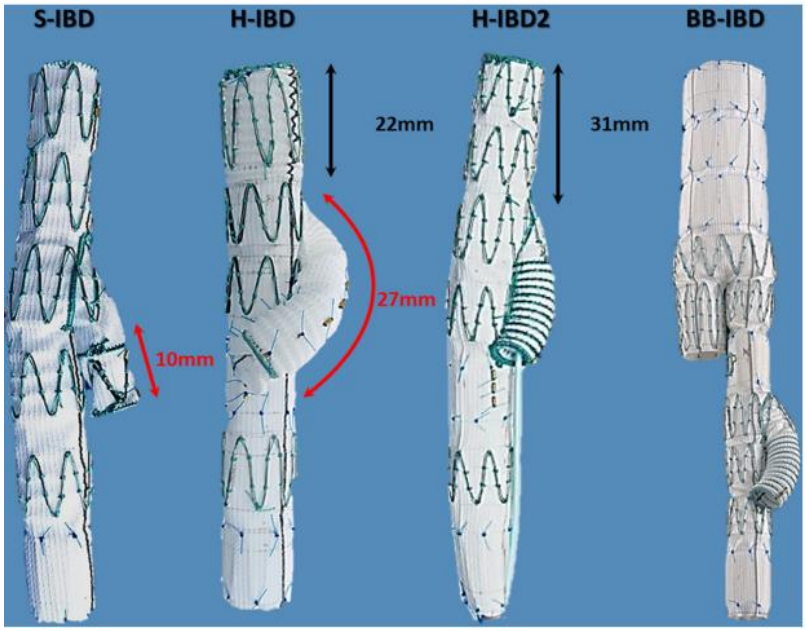
Hypogastric preservation

Straight and helical iliac branched devices (IBD)

Endovascular repair of aortoiliac aneurysmal disease with the helical iliac bifurcation device and the bifurcated-bifurcated iliac bifurcation device

Shen Wong, MD, Roy K. Greenberg, MD, Chase R. Brown, BS, Tara M. Mastracci, MD, James Bena, MS, and Matthew J. Eagleton, MD, *Cleveland, Ohio*

JVS, 2013



130 patients

51% during FEVAR
Technical success: 94%
5/9 failures: IIA ostial stenosis
1 perioperative death (MI)
Follow up 1-72 months
Branch patency: 81.8% at 5 y
Claudication in 5/7 late occlusions
4 “iliac” endoleaks

LIVES

Hypogastric preservation

IBE device

4 studies – 81 cases

No deaths
1 failure of deployment
2 type Ib endoleaks
2/51 early claudication
No persistent claudication

LiVES

IBD vs hypogastric coverage

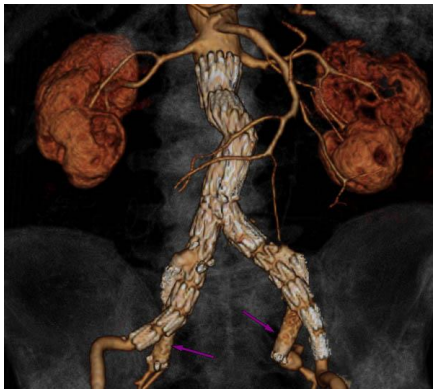
1 year outcome

	23 x IBD		37 x coverage		
Patients	*N*	*%*	*N*	*%*	P
Unrelated mortality	1	4	3	7	1
Reinterventions	0	–	2	5	.1
Iliac endoleak	1	4	7	19	.1
Pelvic ischemia	1	4	8	22	.1
Iliac diameter decrease	7	30	13	35	.8
Iliac limb occlusion	0	–	1	3	1

Verzini et al., JVS, 2008

IBD vs hypogastric coverage

3 month outcome



	Claudicants
Unilateral hypogastric occlusion (n. = 77)	27 (35%)
Unilateral IBD (n. = 4)	0
Bilateral hypogastric occlusion (n . = 6)	2 (33%)
Unilateral hypogastric occlusion + contralateral IBD (n. = 20)	11 (55%)*

*all ipsilateral to hypogastric occlusion

Taudorf et al, JVIR, 2014

My take on the evidence

Hypogastric coverage results in a 15-20% risk of persistent buttock claudication

The risk of sexual dysfunction due to hypogastric coverage is unknown

Patients with suitable anatomy can be safely treated with iliac branched devices

EIA-IIA bypass/transposition is a potential alternative to iliac branched devices

Comparative data on iliac preservation vs coverage is poor

I would offer unilateral or bilateral iliac preservation, if feasible, to active patients, who want to minimise the risk of post-EVAR buttock claudication