

Balloon-expandable Stent-grafts Versus Internal Iliac Component for Endovascular Repair of Iliac Artery Aneurysms with Gore Iliac Branch Endoprosthesis

Joshua Davis, Rohan Basu MD, Raghu Motaganahalli MD,
Andres Fajardo MD



TCT®

TRANSCATHETER
CARDIOVASCULAR
THERAPEUTICS®

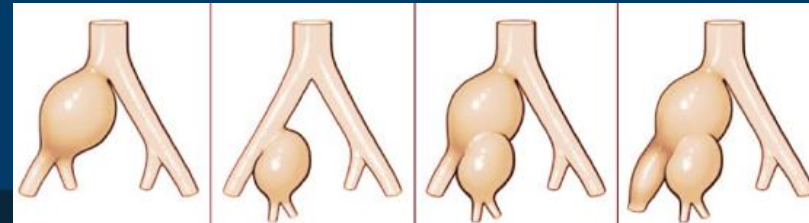
Disclosure of Relevant Financial Relationships

Joshua Davis, Rohan Basu MD, and Raghu Motaganahalli MD DO NOT have any financial relationships to disclose.

My co-author, Andres Fajardo MD, is an advisor for Cook Medical but does not receive direct personal financial remuneration

Management of Iliac Artery Aneurysms

- **Iliac Artery Aneurysms (IAA)** are a relatively uncommon condition characterized by dilation of Iliac Artery over 1.5 cm with repair indicated after dilation to around 3-4 cm
 - Associated with Abdominal Aortic Aneurysm
- Traditionally, treatment of iliac artery aneurysms required open surgery, however endovascular management has increased
- Initial endovascular management of IAA required sacrifice of internal iliac artery through coverage or coil embolization
 - This can increase complications such as pelvic ischemia



Endovascular Approach to Iliac Artery Aneurysms using Iliac Branch Device

- The **Gore Excluder Iliac Branch Prosthesis (IBE)** is a commercially available FDA approved device to treat IAA while preserving blood flow to the internal iliac artery
- Limitations of the Gore IBE internal iliac component (IIC), include having to utilize specific size for distal Iliac with only 3 available diameters
- Balloon-expandable covered stents (BES) can replace the IBE internal iliac component (IIC), allowing a greater variety of working diameters, lengths, and delivery options



Objectives

- This study was conducted to determine the safety and efficacy of utilizing Balloon-expandable covered stents instead of the Internal Artery Component in patients treated for Iliac Artery Aneurysms using the Gore Iliac Branch Endoprosthesis
- Primary Outcomes: Mortality and Reintervention
- Secondary Outcomes: Technical Outcomes and Complications

Research Methods

- We reviewed a prospectively maintained database of all Iliac Artery repairs using the Iliac Branch Device at a single institution from April 2016 to December 2023
- 112 patients with eighteen months of follow-up were included in the study
 - 81 patients were treated using the IBE with Internal Iliac Component
 - 31 patients were treated using the IBE with Balloon Expandable Stents (Viabahn VBX)
- Statistical Analysis was performed in R studio (v. 4.4.0)

Preprocedural Characteristics

- No **major** difference in comorbidities
- Predominantly Male
- Predominantly Elderly
- BES group did have **lower** BMI

	BES n = 31	IIC n = 81	P Value
Age (years)	71.0 +/- 10.7	69.4 +/- 7.9	0.275
Male Sex	30 (96.8%)	80 (98.8%)	1.000
Body Mass Index	27.2 +/- 4.9	31.4 +/- 6.8	0.003
Charleston Comorbidity Index	4.7 +/- 2.0	4.3 +/- 1.9	0.201
Coronary Artery Disease	17 (54.8%)	38 (46.9%)	0.590
Prior Myocardial Infarction	4 (12.9%)	14 (17.3%)	0.775
Hypertension	29 (93.5%)	73 (90.1%)	0.843
COPD	7 (22.6%)	20 (24.7%)	1.000
Presence of Abdominal Aortic Aneurysm	31 (100%)	73 (90.1%)	0.160

Anatomic Details of Iliac Aneurysms

- Iliac Aneurysm location predominantly in **Common Iliac Artery**
- Maximum Size of aneurysm did **not differ** between treatment groups

	BES n = 31	IIC n = 81	P Value
Aneurysm Location			0.408
Common Iliac	24 (77%)	59 (73%)	0.810
External Iliac	0 (0%)	0 (0%)	
Internal Iliac	2 (6%)	2 (2%)	0.306
Bifurcation/Multiple	5 (16%)	20 (25%)	0.449
Maximum Size (mm)	33.9 +/- 12.9	35.7 +/- 10.4	0.401

Periprocedural Outcomes

- Operative Time and Contrast Volume were **increased** in BES group
- No statistical difference in Technical Success
- Trend towards more open access in BES group

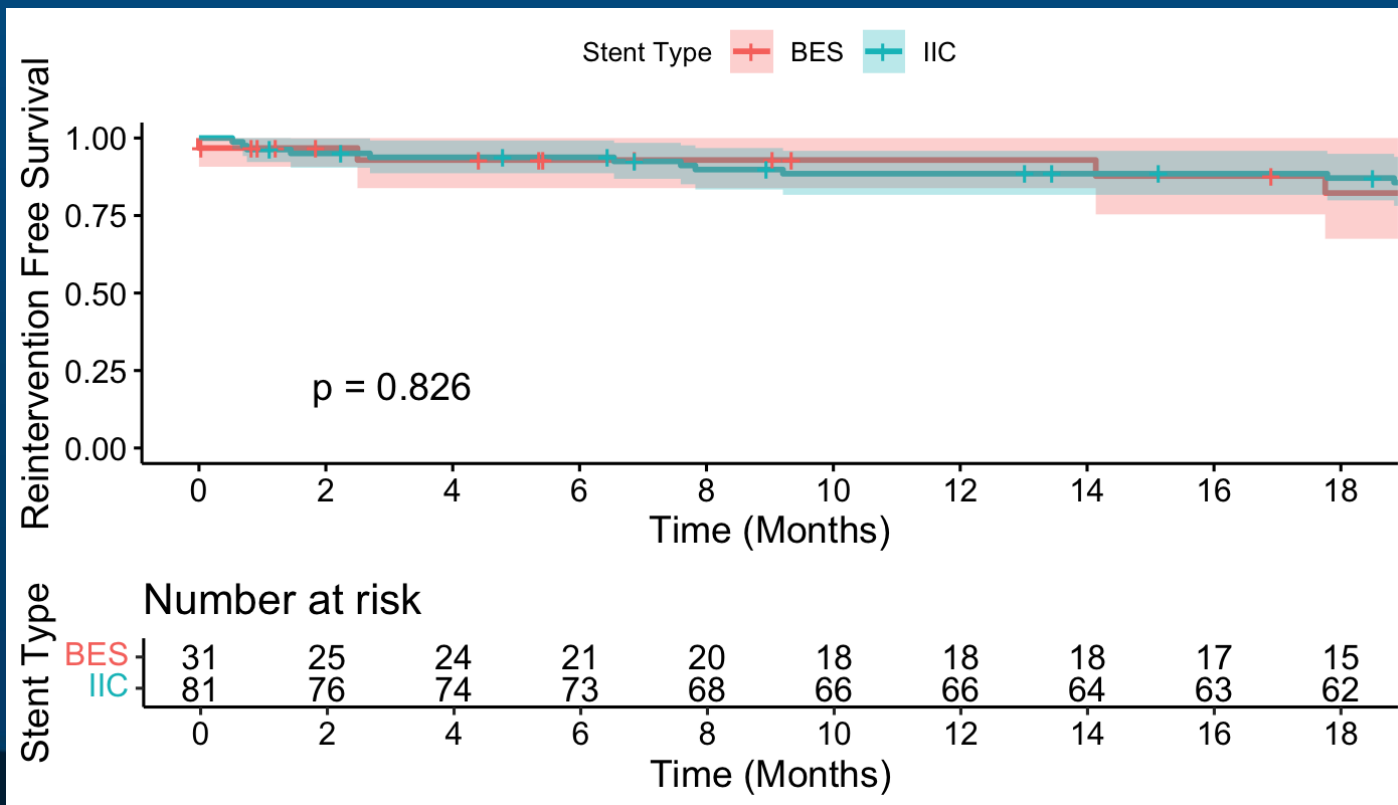
	BES n = 31	IIC n = 81	P Value
Technical Success	31 (100%)	72 (88.9%)	0.122
Estimated Blood Loss (mL)	155.6 +/- 103.1	179.9 +/- 216.8	0.713
Operative Time (min)	192.1 +/- 61.2	164.9 +/- 59.9	0.024
Fluoroscopy Time (min)	46.2 +/- 18.5	44.5 +/- 20.3	0.468
Radiation (mGy)	2692.2 +/- 1711.5	2300.2 +/- 1839.0	0.300
Contrast Volume (mL)	96.3 +/- 37	77.0 +/- 32	0.008
Ipsilateral Groin Percutaneous Access	25 (80.6%)	76 (93.8%)	0.081
Contralateral Groin Percutaneous Access	26 (86.7%)	77 (96.3%)	0.096
IBE Endoleak	5 (16.1%)	4 (4.9%)	0.112

18 Month Postprocedural Primary Outcomes

- Patient in BES group required a femoral endarterectomy at access site
- Patients in IIC group required reintervention due to iliac limb occlusion, migration of components, and graft explant and aortoiliac bypass

	BES n = 31	IIC n = 81	<i>P</i> Value
Mortality	1 (3.2%)	3 (3.7%)	1.000
IBE Specific Reintervention	1 (3.2%)	3 (3.7%)	1.000

Kaplan-Meier Estimate of Reintervention Free Survival by Internal Iliac Artery Component Used



18 Month Postprocedural Secondary Outcomes

- All BES IBE endoleaks were type 2
 - No endoleaks were observed at junction of BES component and internal iliac portion of the IBE
- IIC IBE endoleaks included a type 2 endoleak and a type 1b endoleak

	BES n = 31	IIC n = 81	P Value
Target Vessel Thrombosis	0	3 (3.7%)	0.559
Target Vessel Stenosis	0	1 (1.2%)	1.000
Limb Ischemia	1 (3.2%)	3 (3.7%)	1.000
Pelvic Ischemia	0	0	
Migration	0	1 (1.2%)	1.000
IBE Endoleak	3 (9.7%)	2 (2.5%)	0.123

Summary of Results

- Preprocedural characteristics did not differ between groups other than **lower** BMI in BES group
- Anatomic Details of Iliac Aneurysm did not differ
- Periprocedural outcomes reveal **increased** Contrast Volume and Operative Time in BES cases potentially suggestive of increased technical complexity
- 18-month mortality and need for reintervention did **not differ** between BES and IIC groups
 - There were **no** increased endoleaks or technical complications between BES and IIC groups

Conclusions

- BES other than the IBE IIC are a **viable alternative** to treat internal iliac arteries for endovascular repair of Iliac Artery Aneurysms with **equivalent** mid-term postprocedural outcomes
- Balloon-expandable stents may be used to treat anatomy that does not accommodate normal IIC components in patients with small or diseased internal iliac arteries
- This study is limited by only reviewing repairs performed at a single institution and only 18 months of postprocedural follow-up