Management of Iliac Artery Aneurysms

Dr. Schneider discusses best practices for dedicated iliac branch devices, factors influencing decisions regarding available treatment options, bridging stent selection, how prior EVAR affects decision-making, and future directions.

With Darren B. Schneider, MD

How has the availability of dedicated branched endografts affected your approach to iliac artery aneurysm management?

The availability of dedicated iliac branch devices (IBDs) has fundamentally redefined the standard of care for iliac artery aneurysm management. Preservation of hypogastric artery perfusion should be the default strategy during endovascular aneurysm repair (EVAR) whenever anatomically feasible. The morbidity of hypogastric sacrifice, particularly buttock claudication and sexual dysfunction, is common, and pelvic ischemia can be devastating in select cases. These are clinically meaningful complications that directly affect quality of life.

Before commercially available IBDs, preservation required physician-modified grafts, parallel techniques, or other off-label strategies. Although effective in experienced hands, those approaches added complexity and variability. Modern branched platforms now provide reproducible, purpose-built solutions supported by robust long-term data. Five-year outcomes from prospective multicenter trials demonstrate excellent durability and safety for both commercially available devices. In the Gore Excluder iliac branch endoprosthesis (IBE; Gore & Associates) study, 5-year data showed sustained patency, freedom from secondary interventions, and high rates of hypogastric preservation.[1] Similarly, the PRESERVE II pivotal trial of the Zenith branch iliac system (ZBIS; Cook Medical) reported durable branch patency and low reintervention rates at 5 years.[2]

Given these data, routine coil embolization of a patent hypogastric artery in anatomically suitable patients is increasingly difficult to justify.

In your current practice, how do you decide between available endovascular device options for treating common iliac artery aneurysms? What factors influence your approach?

Device selection is anatomy-driven and individualized. Currently, the two FDA-approved platforms available in the United States are the Gore Excluder IBE and the ZBIS. Neither device is universally superior; each has advantages depending on patient-specific factors. Key considerations for each device include:

- **Access vessel profile.** The Gore IBE utilizes a 16-F delivery sheath, whereas the ZBIS is in a 20-F sheath. In patients with small, calcified, or diseased iliac access vessels, a lower-profile delivery system may be advantageous.
- **Renal-to-bifurcation distance.** The Gore IBE requires a longer working length from the lowest renal artery to the iliac bifurcation (generally at least 165 mm). In patients with short aortoiliac segments, this may limit feasibility.
- **Prior EVAR limb diameter (type Ib endoleak).** In limb revision cases, the diameter of the existing iliac limb is an important consideration. The smaller proximal diameter (12 mm) of the ZBIS is better suited for revising smaller-diameter limbs. In contrast, the Gore IBE has a larger proximal diameter (23 mm), which may not be appropriate for revision of smaller-diameter limbs.
- **Tortuosity.** In severely tortuous iliac anatomy, the flexibility of the Gore IBE platform can improve deliverability and conformability.[3]
- **Aortic aneurysm anatomy.** In patients with an aortic aneurysm, device platform selection is also based on the anatomy of the proximal aortic neck and is not an isolated iliac decision.

Do you have a preference for bridging stents, and why? Balloon-expandable versus self-expanding?

Bridging stent selection is also dependent on anatomy and access. For on-label Gore IBE cases, I typically use the dedicated self-expanding internal iliac component of the modular system that was studied in the pivotal trial.

In cases with concomitant iliac stenosis, calcification, or challenging access, balloon-expandable covered stents (eg, VBX [Gore & Associates] or iCast [Getinge, distributed by Cook Medical]) offer lower-profile delivery options with excellent radial strength for simultaneous treatment of occlusive disease.

When extending distally into hypogastric branches, I often employ a hybrid strategy utilizing a self-expanding covered stent distally to accommodate tortuosity and a balloon-expandable stent proximally to achieve precise overlap and sealing with the IBD.

How does prior EVAR impact your decision-making? Are there unique pitfalls?

In the setting of prior EVAR, IBD placement is most commonly performed to treat type Ib endoleaks. The guiding principle remains hypogastric preservation, but there are specific technical considerations when working within an existing bifurcated endograft, including:

- **Navigating the prior EVAR bifurcation.** Internal iliac limb delivery often requires working around the flow divider of the existing EVAR device. I typically advance a 12-F DrySeal sheath (Gore & Associates) from contralateral femoral access across the bifurcation over a femoral-femoral through-wire. This can be performed without applying downward traction to the prior graft, using a technique described by Tenorio et al.[4]
- **Ipsilateral looped through-wire techniques.** An ipsilateral looped through-wire strategy can also facilitate delivery of the internal iliac limb from ipsilateral femoral access when navigating the prior EVAR bifurcation from contralateral access is problematic.[5]
- **Dimensional constraints.** If the IBD internal iliac cuff must reside within a prior iliac limb, that limb generally must be ≥ 16 mm to accommodate both the internal and external iliac components of the IBD without compression. In smaller-diameter limbs, a minimum of 25 mm between the distal end of the prior limb and the hypogastric origin is typically required. Failure to respect these constraints can result in limb compression and thrombosis.

What factors determine which internal iliac branch to land in?

Distal extension into internal iliac branches is required when the main internal iliac artery is aneurysmal. In most patients, the posterior division—often the superior gluteal artery—is the preferred target, as it is usually the largest internal iliac branch, and preserving it is protective against buttock claudication.[6]

If sexual function preservation is a primary concern and anatomy is favorable, targeting an anterior division branch may be appropriate.

In bilateral repairs, some operators preserve the posterior division on one side and anterior on the other, although comparative data are limited.

Finally, when extending into an internal iliac branch, nontarget large branches should be embolized to prevent retrograde endoleak.

Is there ever a role for parallel grafting? When is coil embolization appropriate?

Parallel grafting now occupies a limited but important niche when hypogastric preservation is desired but anatomy is unsuitable for commercially available IBDs. Examples include:

- A common iliac lumen too small to accommodate an IBD
- Saccular iliac aneurysms
- Chronic dissections with compressed true lumen
- Revision of small-diameter EVAR limbs

However, with contemporary IBD platforms available and techniques to expand their applicability, the need for parallel grafting has decreased dramatically. Intentional coil embolization and hypogastric coverage remain appropriate only when anatomy is prohibitive and the internal iliac artery is severely diseased or not a suitable branch target. However, given contemporary device performance and 5-year durability data, hypogastric preservation should be attempted in the vast majority of anatomically suitable patients.

How do you see iliac artery aneurysm management evolving?

IBDs have already shifted the paradigm toward routine hypogastric preservation. Future evolution will likely include lower-profile delivery systems, improved trackability and conformability in tortuous anatomy, integrated EVAR limbs with built-in iliac bifurcations, and expanded size matrices.

Importantly, iliac branch technology is increasingly integrated into complex aortic reconstruction. In thoracoabdominal and fenestrated/branched EVAR cases, preservation of pelvic perfusion is critical, especially in

patients at risk for spinal cord ischemia (SCI). In this broader context, IBDs are not only merely adjuncts for iliac aneurysms, they are also essential components of a comprehensive SCI prevention strategy. ■

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