Preservation of internal iliac artery (IIA) flow has been previously evaluated in the literature. In that sense, placement of iliac branch devices (IBDs) represents one of the most popular endovascular options when anatomically feasible. The first paper reporting the results of the pErformance of Iliac branch devices for aneurysms (pELVIS) Registry included 575 patients undergoing 650 IBD implantations with ZBIS (Cook Medical) or Gore (WL Gore & Associates) IBDs. This retrospective analysis of prospectively collected data by prearranged protocols of the first six European vascular centres (Münster, Florence, Rome, Thessaloniki and Perugia) was published in 2017 and it showed good mid-term patency (at 32.6±9.9 months clinical follow-up) with a low reintervention rate (7.3%). In this same year, universities in Lille, Hamburg and Leipzig joined the registry. The aim of this report is to provide the latest long-term evidence and to evaluate the performance of IBDs in challenging conditions outside their normal usage.

Instructions for Use for Iliac Branch Device

The recommendations for IBDs refer to the length and diameter of the external iliac artery (EIA), the IIA and the common iliac artery (CIA). Generally, uniform artery length of the EIA, IIA and CIA should be more than 20 mm, 10 mm and 50 mm, respectively, while the IIA diameter should not exceed 11 mm to be acceptable for proper sealing (4–11 mm for ZBIS IBDs from Cook Medical; 6.5–13.5 mm for Gore IBD).

In 2010, Karthikesalingam et al. published an overview of the morphological suitability of patients with aortoiliac aneurysms for the use of commercially available IBDs. The majority of the people in this patient group were not fully compliant with selection criteria for IBD deployment according to the published guidelines by expert vascular surgeons nor the device manufacturer noting that the most common single anatomical challenge for IBD use was an aneurysmal IIA (AIIA). Other common limitations for IBD use are the presence of short (<50 mm) or narrow CIA, or the presence of ostial IIA disease.

Co-existing Internal Iliac Artery Aneurysm

There are several difficulties to ensuring an adequate sealing zone when there is a co-existing AIIA. If the IBD branch diameter is 8 mm, an 8-mm balloon-expandable covered stent which varies in length between 22–59 mm needs to be employed. Consequently, an IIA diameter of more than 12 mm would be associated with an inadequate distal seal. Therefore, in case of a coexisting AIIA, sealing into the posterior trunk or one of the main IIA branches is needed to guarantee adequate sealing. However, this would create a diameter discrepancy between the IBD branch (posterior trunk) and the IIA branch used for distal landing. Hence, more than one bridging device should be used to seal the device and achieve better docking.

The presence of AIIA can be associated with a higher incidence of type I endoleak, stenosis or thrombosis of the branch. In addition, the available stent grafts have different features and performance, especially in angulated IIA. To our knowledge, there are only two published series with fewer than 20 patients each that describe the use of IBD in co-existing AIIAs. The Münster group described a
Peripheral Artery Disease

Iodine contrast medium were significantly reduced in patients of iodine contrast medium were significantly reduced in patients who had coiling and plugging. This stresses that IBD had better results, especially in young patients.

**Conclusion**

The pELVIS Registry is the largest multicentre, retrospective analysis of the use of IBD to treat iliac and aortoiliac aneurysms. The results are promising with good outcomes in terms of safety, feasibility and midterm patency. The most common single anatomical challenge for IBD use is the presence of aneurysmal IIA. The registry’s findings about the treatment of concomitant aneurysmal lesion of the IIA artery will provide significant information about the performance of IBDs for this specific clinical presentation.

The fact that most of the type I endoleaks and occlusions appeared during the follow-up period highlighted the importance of radiological surveillance with annual CT angiographies and restricting the use of duplex scanning, especially in obese patients. Within the pELVIS Registry, all cases with occluded IIA (11/650 IBDs [1.6%]) were asymptomatic with patent contralateral IIA. Therefore, no reinterventions were required to recanalise the occluded IIA. A meta-analysis comparing IBD with coiling or plugging the IIA and extension to the EIA showed higher risk for gluteal claudication for the patients who had coiling and plugging. This stresses that IBD had better results, especially in young patients.

**Additional pELVIS Registry collaborators**

Münster, Germany: Martin Austermann.
Florence, Italy: Walter Dorigo; San Camillo Forlanini.
Rome, Italy: Piergiorgio Cao, Ciro Ferrer, Tor Vergata, Arnaldo Ippoliti, Matteo Barbante.
Thessaloniki, Greece: Georgios A Pitoulas.
Perugia, Italy: Fabio Verzini, Gianbattista Parlani, Gioele Simonte.
Hamburg, Germany: Tilo Kölbel, Nikolaos Tsiilimparis.
Lille, France: Stephanie Haulon.
Leipzig, Germany: Daniela Branzan, Andrej Schmidt.


