



# Endovascular Treatment of Concurrent Bilateral Common and Internal Iliac Artery Aneurysms with Preserved Pelvic Circulation: Bilateral Iliac Branch Devices with Opposing Single Division Internal Iliac Artery Sparing

Ramsey Al-Hakim, MD, Libby Watch, MD, and Alex Powell, MD

## ABSTRACT

An 83-year-old man with bilateral common iliac artery aneurysms (right, 3.0 cm; left, 2.7 cm), bilateral internal iliac artery aneurysms (right, 3.4 cm; left, 2.6 cm), and an abdominal aortic aneurysm (3.8 cm) was treated with an aortobi-iliac stent graft and bilateral iliac branch devices. The internal iliac components were extended into opposing posterior (left) and anterior (right) divisions of the internal iliac artery using stent grafts. Computed tomography angiography demonstrated that all aneurysms decreased or were stable in size with patent stent grafts at 1 month. The patient was asymptomatic without complications of pelvic ischemia at the last clinical follow-up at 6 months.

## ABBREVIATIONS

AAA = abdominal aortic aneurysm, CIA = common iliac artery, IIA = internal iliac artery

Endovascular treatment of concurrent abdominal aortic and common iliac artery (CIA) aneurysms with internal iliac artery (IIA) sparing has been made technically feasible with the advent of iliac branch devices such as the GORE EXCLUDER Iliac Branch Endoprosthesis (W.L. Gore & Associates, Inc, Flagstaff, Arizona) (1). However, these devices require adequate sealing in the IIA and thus have limitations in the setting of an IIA aneurysm. For example, the GORE EXCLUDER Iliac Branch Endoprosthesis instructions for use require an IIA diameter between 6.5 mm and 13.5 mm. Although IIA occlusion is an acceptable treatment option, this technique is associated with significant risks (2–10). The most common complication reported

with IIA embolization is gluteal claudication, with estimated rates from pooled clinical data of 28% and 42% after unilateral and bilateral IIA embolization, respectively (6). Other associated complications include erectile dysfunction (17%) and colonic ischemia (3.4%) (6). Anatomic and technical limitations frequently make IIA sparing very difficult, if not impossible, during endovascular treatment. Surgical options are also available but are more invasive and sometimes require complex reconstructions, including translocating the IIA to the external iliac artery or combining an aorto-unilateral iliac stent graft, femorofemoral bypass, and external iliac-to-IIA endograft to preserve 1 hypogastric artery (11,12). This report describes endovascular treatment of bilateral CIA and IIA aneurysms with a modified technique using bilateral iliac branch devices with extension of the internal iliac components into opposing anterior and posterior divisions of the IIA to preserve pelvic circulation.

## CASE REPORT

An 83-year-old man presented with incidentally discovered bilateral CIA and IIA aneurysms (right CIA diameter, 2.6 cm; left CIA diameter, 2.7 cm; right IIA diameter, 3.4 cm; left IIA diameter, 2.0 cm) and an infrarenal

From the Miami Cardiac & Vascular Institute, Baptist Hospital of Miami, 8900 N Kendall Drive, Miami, FL 33176. Received July 20, 2017; final revision received October 26, 2017; accepted October 29, 2017. Address correspondence to R.A.-H.; E-mail: [ramsey.hakim@gmail.com](mailto:ramsey.hakim@gmail.com)

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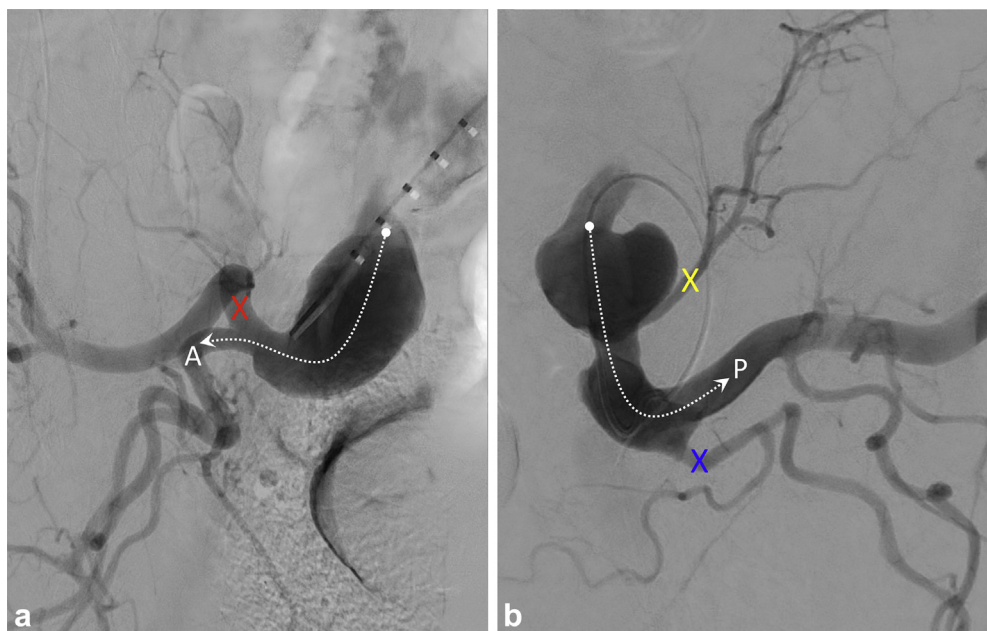
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**Figure 1.** Pelvic angiogram demonstrates bilateral CIA aneurysms (arrows) and bilateral IIA aneurysms (arrowheads). A 3.8-cm AAA with mural thrombus was also identified on CT performed before the procedure.

abdominal aortic aneurysm (AAA) measuring 3.8 cm. Given the complexity of required intervention for the 5 aortoiliac aneurysms, the initial management was conservative with serial imaging. However, repeat computed tomography (CT) performed 1 year later demonstrated an increase in size of multiple aneurysms, including the right CIA aneurysm increasing to 3.0 cm and the left IIA aneurysm increasing to 2.6 cm. The patient was physically active and denied any symptoms of claudication. An initial diagnostic angiogram was performed to delineate the complex pelvic anatomy for procedural planning (**Fig 1**). Subsequent angiograms were obtained with coil embolization of an aberrant left iliolumbar artery arising from the left IIA and coil embolization of a diminutive anterior division of the left IIA, successfully isolating the posterior division of the left IIA as the only branch arising from the left IIA (**Fig 2a, b**).

Bilateral Gore 16-F sheaths (W.L. Gore & Associates, Inc) were placed through surgical cutdowns 4 weeks later. The patient was administered peripheral intravenous heparin with an activated clotting time goal > 200 seconds throughout the procedure. Embolization of the posterior division of the right IIA artery was performed using an 8-mm AMPLATZER Vascular Plug 4 (St. Jude Medical, Inc, St. Paul, Minnesota), isolating the anterior division of the right IIA artery as the only branch arising from the right IIA (**Fig 2a**). A 23 mm × 14.5 mm × 10 cm GORE EXCLUDER Iliac Branch Endoprosthesis was advanced into the right iliac artery and deployed. The internal iliac gate was cannulated, and an 8-mm-diameter × 5-cm-long GORE VIABAHN Endoprosthesis (W.L. Gore &



**Figure 2.** Bilateral IIA ipsilateral oblique angiograms. **(a)** Right IIA angiogram demonstrates an IIA aneurysm extending to the bifurcation. The posterior division of the right IIA (red X) was occluded with an AMPLATZER Vascular Plug 4; the anterior division of the right IIA (white A) was spared as the extension target for the right iliac branch device internal iliac component (arrow) using a GORE VIABAHN Endoprosthesis. **(b)** Embolization of an aberrant iliolumbar branch from the left CIA (yellow X) and the anterior division of the left IIA (blue X) was performed with coils; the posterior division of the left IIA (white P) was spared as the extension for the left iliac branch device internal iliac component (arrow) using a GORE VIABAHN Endoprosthesis.

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