

Slow growth rate in a rare isolated external iliac aneurysm

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ABSTRACT

A 91-year-old man was referred for an asymptomatic saccular left external iliac aneurysm. Comorbidities included hypertension, hyperlipidemia, peripheral arterial disease, prior radical prostatectomy with bilateral pelvic lymphadenectomy for prostate cancer, left partial nephrectomy for small renal cell carcinoma, and fundoplication for Barrett's esophagus. Review of prior computed tomography scan of the abdomen revealed that the aneurysm had been present for the last 24 years (measuring 1.6 cm in 1999) with slow growth until 2023 (measuring 2 cm). On surveillance imaging the next year, the maximum diameter had increased to 2.8 cm. He was treated successfully with an endograft limb. Isolated external iliac artery aneurysms are extremely rare, and this single case report supports that these have a very slow growth rate. (J Vasc Surg Cases Innov Tech 2025;11:101791.)

Keywords: External iliac artery aneurysm; Aneurysm; Iliac isolated

External iliac artery (EIA) aneurysms are exceedingly rare.¹ There are fewer than 50 total cases published in literature, and the majority have presented with compressive symptoms or rupture.² Rupture is associated with a high mortality and has been reported at a size as small as 40 mm.¹ There are no reports on the growth rate of these aneurysms, and this case supports literature that suggests that the growth of EIA aneurysm is slow. The patient consented to the publication of this case report.

CASE REPORT

A 91-year-old man was referred for an asymptomatic left external iliac aneurysm. He was previously managed for multifactorial left ankle wounds in 2023 when the ankle-brachial index on the left was 0.75 and ankle pressures were 94 mm Hg. At the time, he underwent a diagnostic angiogram that demonstrated the EIA aneurysm (Fig 1), as well as peripheral arterial disease, calcific popliteal artery occlusion, and reconstitution of the tibial arteries in the mid leg. Comorbidities included hypertension, hyperlipidemia, peripheral arterial disease, prior radical prostatectomy with bilateral pelvic lymphadenectomy for prostate cancer, left partial nephrectomy for small renal cell carcinoma, and fundoplication for Barrett's esophagus. He lived in assisted living, had a good quality of life with family support, and was ambulatory with some limitation owing to ankle and knee pain from prior orthopedic surgery. The wounds healed



Fig 1. Centerline reconstruction of computed tomography images of the abdomen of an external iliac artery (EIA) aneurysm, on retrospective review present in 1999, remained unchanged in size until 2023, with subsequent enlargement.

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with best medical management for peripheral arterial disease and wound care.

Review of prior computed tomography scan of the abdomen revealed that the aneurysm had been present for the last 24 years (since 1999) (Fig 2). The EIA aneurysm enlarged by 2 mm between 1999 and 2005 and another 2 mm between

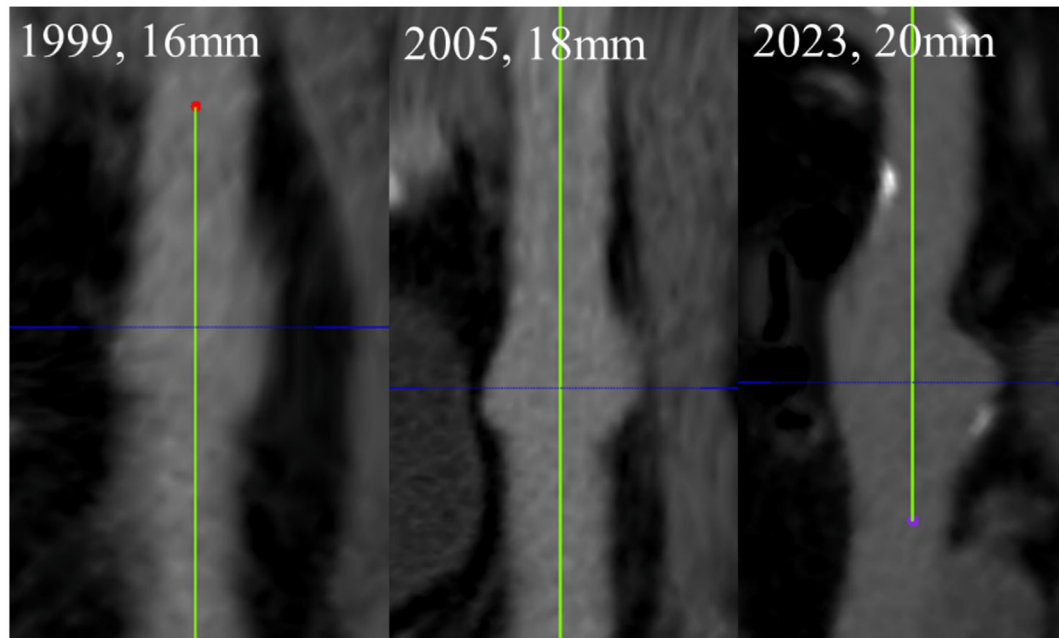


Fig 2. Saccular morphology from intraoperative angiography prior to endovascular repair.

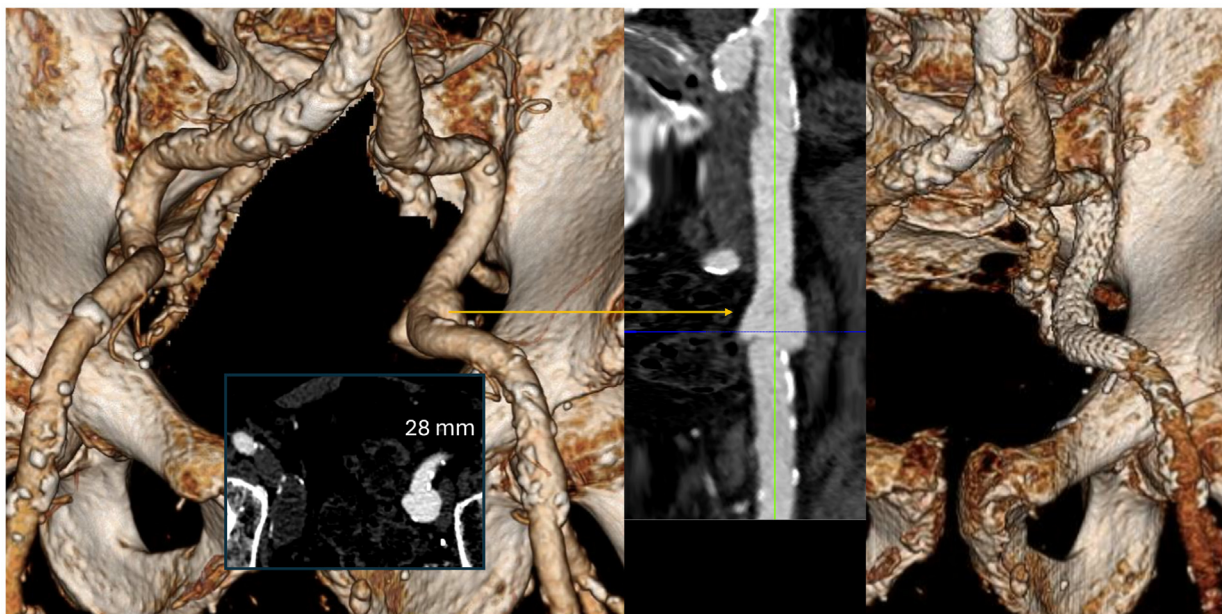


Fig 3. Saccular 2.8-cm external iliac artery (EIA) aneurysm, centerline reconstruction, and endovascular repair with retrograde covered 16 mm × 14.5 mm × 10 mm Gore iliac limb stent graft placement.

2005 and 2023, after which there was more rapid change of 8 mm in the next year (Fig 2). There was no immediate concern for a mycotic etiology.

Thus, on surveillance imaging in 1 year, the maximum diameter had increased to 2.8 cm from 1.6 cm, and was of a saccular morphology. He was referred to vascular surgery, and we advised repair owing to its morphology and continued growth. Aneurysm characteristics were suitable for endovascular repair. Retrograde ipsilateral iliac access was obtained with a

micropuncture needle under ultrasound guidance, initial placement of a 6F sheath for diagnostic angiogram (Fig 3), upsized to a 12F Gore (W. L. Gore & Associates, Flagstaff, AZ) Dryseal sheath for stent deployment. The angiogram demonstrated no concurrent or contralateral aneurysmal disease. He was successfully treated with exclusion of the aneurysm by a covered 16 mm × 14.5 mm × 10 mm Gore iliac limb stent graft (Fig 3). The distal end of the endograft limb was landed 3 cm proximal to the hip joint, and the sheath was withdrawn proximally into the

Table. All published reports on external iliac artery (EIA) aneurysms

Author	Year	Article	Age, years	Sex		Ruptured?	Comorbidities	Location	Size, in, cm	Morphology/etiology	Type of surgery	Prosthesis used for reconstruction
Polat et al	2011	Spontaneous mycotic external iliac artery aneurysm rupture after perforated acute appendicitis in a renal allograft recipient	27	F	Abdominal tenderness and hypotension	No	Renal transplant to R EIA, appendicitis, candida albicans infection, aneurysm developed/ discovered after renal graft was removed, excision and debridement	R EIA	nr	Mycotic	Resection/ligation, femorofemoral bypass	NR
Tanaka et al	2022	Bilateral external iliac artery aneurysm in a young man	31	M	Claudication, hip pain	No	NR	Bilateral EIA	11, 3.5	Fusiform, atherosclerotic	Open repair, resection with tube graft replacement	10, 8 mm PTFE
Mareshwari et al	2023	Isolated external iliac artery aneurysm: a rare case presentation of IgG4-related disease	32	M	Pulsatile mass	No	Smoking	L EIA	8.7	Fusiform, IgG4-related	Open repair, iliofemoral bypass	8 mm polyester graft
Teran et al	1989	Embolomycotic aneurysm of external iliac artery: producing ipsilateral hydronephrosis and venous insufficiency	33	F	Unilateral hydronephrosis and LE edema	No	Step viridans endocarditis	R EIA	15	Mycotic	Resection, extraperitoneal left EIA to right femoral artery bypass with knitted Dacron graft	NR
Salimi et al	2023	Calf arteriovenous malformation presenting as an iliac artery aneurysm: a case report	35	M	Pulsatile mass	No	Varicose veins, AVMs	R EIA	13	Flow related, secondary to lower extremity AVM	None - conservative management	NR
Hirai et al	2023	Anesthetic management of external iliac artery transection in a morbidly obese patient with Klippel-Trenaunay-Weber syndrome: a case report	47	M	Right femoral swelling	No	Klippel-Trenaunay syndrome, status post R femur amputation	R EIA	2	Klippel-Trenaunay syndrome	R EIA transection	NR
Chatzantonis et al	2020	A surprising diagnosis in a young patient with intermittent claudication: symptomatic isolated external iliac artery aneurysm associated with cystic media necrosis	51	M	Right LE claudication	No	Smoking	R EIA	2	Fusiform, cystic medial necrosis	Open repair, resection with tube graft replacement	8 mm Dacron
Desai et al	2013	Arteriojejunal fistula presenting with recurrent obscure GI hemorrhage in a patient with a failed pancreas allograft	54	F	Hematochezia and lightheadedness	Yes	ESRD, T1DM: status post renal and pancreas transplant, diffuse large B-cell lymphoma,	R EIA	NR	EIA-jejunal fistula	Covered stent (iCast 7 mm × 59 mm)	NR
Hussain et al	2019	Giant external iliac artery aneurysm	55	M	Left thigh pain	No	HTN, HLD, status post bilateral inguinal hernia repair	L EIA	7	Atherosclerosis	Open repair, resection with tube graft replacement	10 mm PTFE
Kajikawa et al	1995	Rupture of an external iliac artery aneurysm into the bladder: a case report and review of the literature	58	F	Hematuria	Yes	Uterine cancer; neurogenic bladder; R nephrectomy; status post vesicocoeal fistula closure	R EIA	NR	Mycotic	Open, common iliac-femoral bypass	PTFE
Singh et al	2006	External iliac artery aneurysm and ureteric obstruction in a solitary kidney	64	M	Moderate hydronephrosis in solitary kidney	No	Left nephroureterectomy for RCC; renal failure	R EIA	8.7	NR	Covered stent	NR
van de Luitgaarden et al	2019	External iliac artery aneurysm causing severe venous obstruction	65	M	Left leg swelling	No	NR	L EIA	3.5	Fusiform, atherosclerotic	Excision, tube graft replacement	NR
Shintani et al	2023	Isolated external iliac artery aneurysm with fibromuscular dysplasia	74	M	Incidental finding on postoperative course	No	Gastric cancer	L EIA	3.5	Fibromuscular dysplasia	Ligation, aorto-uni-femoral bypass	8 mm Triplex graft (Terumo)
Smith et al	2011	Iliac artery pseudoaneurysm rupture following excision of an infected hip prosthesis	74	F	Hip pain	Yes	Staphylococcus epidermidis infection with infected total hip arthroplasty	L EIA	3	Mycotic	Open repair, resection and reconstruction	Reversed saphenous vein graft

(Continued on next page)

Table. Continued.

Author	Year	Article	Age, years	Sex		Ruptured?	Comorbidities	Location	Size, in, cm	Morphology/etiology	Type of surgery	Prosthesis used for reconstruction
Tanaka et al	2022	Anaesthetic management of an abdominal aortic aneurysmorrhaphy in Klippel-Trenaunay-Weber syndrome: a case report	74	M	Right lower extremity swelling and pain	No	Klippel-Trenaunay syndrome, AVMs, status post gastrectomy for gastric cancer	R EIA	4.2	Flow related aortoiliac aneurysm	Aneurysmorrhaphy to reduce aortic aneurysm size, no specific mention of EIA	NR
Urdangarain et al	2006	Obstructive anuria secondary to left external iliac artery aneurysm	76	M	Lumbar pain and anuria	No	Solitary kidney	L EIA	NR	NR	Open repair	NR
Kato et al	2009	Ruptured isolated external iliac artery true aneurysm associated with cystic medial necrosis: report of a case	78	F	Right hypogastric pain	Yes	Appendectomy, hysterectomy, hypertension	R EIA	4	Cystic medial necrosis	Open repair, resection and reconstruction	6 mm PTFE
Whittaker et al	2008	Endovascular repair of a primary iliac- cecal fistula presenting with gastrointestinal hemorrhage	85	F	Colicky abdominal pain, bleeding per rectum	No	HTN, status post nephrectomy for pyelonephritis	R EIA	6	Mycotic	Covered stent (12 mm × 30 mm Wallgraft)	NR
Sarafi et al	2024	Ruptured external iliac artery aneurysm: a case report	85	M	Right-sided abdominal pain	Yes	None	R EIA	8	Atherosclerosis	Open repair, resection with tube graft replacement	12 mm Dacron
Ozturk et al	2010	Spontaneous thrombosis of a saccular iliac artery aneurysm induced by overlapping self-expandable metallic stents	NR, 1 patient	NR	NR	No	NR	EIA	NR	Saccular aneurysm	NR	NR
Crivello et al	1986	Isolated external iliac artery aneurysm secondary to cystic medial necrosis	NR, 1 patient	NR	NR	No	Appendectomy	R EIA	NR	Cystic medial necrosis, saccular aneurysm	Ligation, friable vessels	NR
Brunkwall et al	1989	Solitary aneurysms of the iliac arterial system: an estimate of their frequency of occurrence	NR, 1 patient	NR	NR	No	NR	EIA	NR	NR	NR	NR
Karch et al	2000	Adverse consequences of internal iliac artery occlusion during endovascular repair of abdominal aortic aneurysms	NR, 1 patient	NR	NR	No	NR	EIA	NR	NR	NR	NR
Kalko et al	2005	The surgical treatment of arterial aneurysms in Behcet disease: a report of 16 patients	NR, 16 patients	NR	NR	No	NR	EIA	NR	Behçets	Ligation, femorofemoral bypass	NR
Shutze et al	2017	Results of repair of iliac artery aneurysms with the sandwich technique	NR, 2 patients	NR	NR	No	NR	EIA	NR	NR	NR	NR

AVM, Arteriovenous malformation; ESRD, end-stage renal disease; F, female; IgG, immunoglobulin G; HLD, hyperlipidemia; HTN, hypertension; NR, not reported; L, left; LE, lower extremity; M, male; PTFE, polytetrafluoroethylene; R, right; RCC, renal cell carcinoma; T1DM, type 1 diabetes mellitus.

distal EIA for deployment of the endograft limb. He is doing well 8 months postoperatively. Postprocedure computed tomography angiography revealed a good technical result with a patent stent graft and no dissection or endoleak. Further surveillance is planned with yearly arterial duplex examination.

DISCUSSION

Isolated EIA aneurysms are extremely rare, and this patient’s case report who had imaging follow-up over 25 years before repair, supporting that these have a very slow growth rate. The average size of the EIA in the United States is reported to be 6.7 ± 0.7 mm in

men and 6.5 ± 1.9 in women.³ Reports on EIA aneurysm note aneurysm sizes that vary from 3 to 8 cm, and most report a saccular morphology (Table). There are no published reports of the growth rate of EIA aneurysm.¹⁻²² Rupture is reported to a size of 4 cm, so repair at a size of 3 cm seems reasonable. Repair is also indicated if there is growth, saccular morphology, or a symptomatic presentation. Embryologically, the EIA is derived from the iliofemoral system, and the common and internal iliac arteries develop from the sciatic axial artery; this may explain the rarity of aneurysmal degeneration of this artery. Most of the

literature on the subject is from the European Society for Vascular Surgery recommendations for common iliac artery aneurysms that recommend a treatment cut-off for treatment was set at 4 cm.^{23,24} In a systematic review of iliac aneurysms by Charisis et al,²³ only two common iliac artery aneurysms ever reported ruptured when smaller than 4 cm (3.4 cm and 3.8 cm). One of them was found in a cadaver. In the internal iliac artery, which has even smaller diameter, Laine et al²⁵ reported four patients with rupture at smaller than 3 cm and three at smaller than 4 cm. These authors suggest EIA aneurysms could be treated for a diameter of 3.5 cm.

In our patient, the etiology was likely degenerative, and endovascular repair was performed owing to the patient's age and comorbidities. Anatomical criteria, including the location of the aneurysm, which was sufficiently away from the inguinal ligament, allowed a self-expandable stent landing zone conducive to endovascular repair. The average age reported for EIA aneurysm is 58 years (range, 27-85 years) and affects predominantly males. Etiologies include cystic medial necrosis, atherosclerosis, fibromuscular dysplasia, trauma, immunoglobulin G4 disease, and mycotic aneurysms.¹⁻²² Open reconstruction, interposition grafting with polytetrafluoroethylene/Dacron, and endovascular repair (with self-expanding Wallgraft and balloon expandable i-Cast stent grafts) has been reported (Table). Elective repair is safe and effective, with excellent patency. Extraperitoneal rupture of an atherosclerotic aneurysm or fistulization to the bladder or bowel are associated with mortality. Details of the published case reports are listed in Table.

CONCLUSIONS

EIA aneurysms extremely rare and are reported more commonly in males. Based on our case report, the growth rate seems to be slow; however, elective repair is advised to prevent morbidity and mortality owing to rupture. We recommend repair at a size of 3.5 cm, or at any size if symptomatic or enlarging.

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REFERENCES

1. Kato T, Takagi H, Kawai N, Sekido Y, Umemoto T. Ruptured isolated external iliac artery true aneurysm associated with cystic medial necrosis: report of a case. *Surg Today*. 2009;39:705–709.
2. Brunkwall J, Hauksson H, Bengtsson H, Bergqvist D, Takolander R, Bergentz S-E. Solitary aneurysms of the iliac arterial system: an estimate of their frequency of occurrence. *J Vasc Surg*. 1989;10:381–384.
3. Timaran CH, Stevens SL, Freeman MB, Goldman MH. External iliac and common iliac artery angioplasty and stenting in men and women. *J Vasc Surg*. 2001;34:440–446.

4. Crivello MS, Porter DH, Kim D, Critchlow JF, Scoutt L. Isolated external iliac artery aneurysm secondary to cystic medial necrosis. *Cardiovasc Intervent Radiol*. 1986;9:139–141.
5. Terán NA, Gonzalez NM, García L, Gonzalez FE, Rivera HE. Embolomycotic aneurysm of external iliac artery: producing ipsilateral hydronephrosis and venous insufficiency. *Tex Heart Inst J*. 1989;16:51–55.
6. Kajikawa T, Satoh S, Banya Y, Fujioka T, Kubo T. [Rupture of an external iliac artery aneurysm into the bladder: a case report and review of the literature]. *Hinyokika Kiyo*. 1995;41:141–143.
7. Karch LA, Hodgson KJ, Mattos MA, Bohannon WT, Ramsey DE, McLafferty RB. Adverse consequences of internal iliac artery occlusion during endovascular repair of abdominal aortic aneurysms. *J Vasc Surg*. 2000;32:676–683.
8. Ochoa UO, Hermida Pérez JA, Montes de Oca JO. [Obstructive anuria secondary to left external iliac artery aneurysm. Case report]. *Arch Esp Urol*. 2006;59:281–284.
9. Singh C, Raza M, Kouriefs C, Masood S, Bosanac Z, Mufti GR. External iliac artery aneurysm and ureteric obstruction in a solitary kidney. *Emerg Med J*. 2006;23:660.
10. Polat KY, Aydinli B, Keles M, et al. Spontaneous mycotic external iliac artery aneurysm rupture after perforated acute appendicitis in a renal allograft recipient. *Exp Clin Transpl*. 2011;9:211–213.
11. Smith GH, Nutton RW, Fraser SC. Iliac artery pseudoaneurysm rupture following excision of an infected hip prosthesis. *J Arthroplasty*. 2011;26:977.e13–977.e15.
12. Shutze RA, Oglesby W, Lee A, Shutze WP. Results of repair of iliac artery aneurysms with the sandwich technique. *Proc (Bayl Univ Med Cent)*. 2017;30:7–10.
13. Hussain AS, Aziz A. Giant external iliac artery aneurysm. *Ann Vasc Surg*. 2019;58:386.e1–386.e3.
14. van de Luijtgaarden KM, Brehm V. External iliac artery aneurysm causing severe venous obstruction. *Eur J Vasc Endovasc Surg*. 2019;57:739.
15. Chatzantonis G, Schmoll L, Strübing F, Chatzantonis G, Kühner C. A surprising diagnosis in a young patient with intermittent claudication: symptomatic isolated external iliac artery aneurysm associated with cystic media necrosis. *J Vasc Surg Cases Innov Tech*. 2020;6:352–356.
16. Tanaka CM, Matielo MF, Nakamura ET, Tiossi SR. Bilateral external iliac artery aneurysm in a young man. *J Vasc Surg Cases Innov Tech*. 2022;8:57–59.
17. Tanaka Y, Sakamoto SI, Bito H, Sakamoto A. Anaesthetic management of an abdominal aortic aneurysmorrhaphy in Klippel-Trenaunay-Weber syndrome: a case report. *BMC Anesthesiol*. 2022;22:214.
18. Hirai N, Kinoshita H, Kitayama M, Kushikata T, Hirota K. Anesthetic management of external iliac artery transection in a morbidly obese patient with Klippel-Trenaunay-Weber syndrome: a case report. *JA Clin Rep*. 2023;9:18.
19. Maheshwari N, Vaddavalli VV, Abuji K, Savlania A, Nada R. Isolated external iliac artery aneurysm: a rare case presentation of IgG4-related disease. *J Vasc Bras*. 2023;22:e20220119.
20. Salimi J, Atieh A, Ftouni Y. Calf arteriovenous malformation presenting as an iliac artery aneurysm: a case report. *Int J Surg Case Rep*. 2023;113:109082.
21. Shintani Y, Hiromatsu S, Yamada K, et al. Isolated external iliac artery aneurysm with fibromuscular dysplasia. *Ann Vasc Dis*. 2023;16:69–72.
22. Sarafi M, Hatami D, Ansari K, Rast M. Ruptured external iliac artery aneurysm: a case report. *Int J Surg Case Rep*. 2024;121:109964.
23. Charisis N, Bouris V, Rakic A, Landau D, Labropoulos N. A systematic review on endovascular repair of isolated common iliac artery aneurysms and suggestions regarding diameter thresholds for intervention. *J Vasc Surg*. 2021;74:1752–1756.e1.
24. Wanhainen A, Van Herzele I, Bastos Goncalves F, et al. Editor's Choice – European Society for Vascular Surgery (ESVS) 2024 clinical practice guidelines on the management of abdominal aorto-iliac artery aneurysms. *Eur J Vasc Endovasc Surg*. 2024;67:192–331.
25. Laine MT, Björck M, Beiles CB, et al. Few internal iliac artery aneurysms rupture under 4 cm. *J Vasc Surg*. 2017;65:76–81.

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