Case Report

Endovascular Repair of a Common Iliac Pseudoaneurysm and Aortic Ectasia in a Patient with Horseshoe Kidney and Pancreatitis: A Case Report

Abdullah Fakhro[1], Nilay Shah[2], T.L. Barnes[3]

[1]Department of Surgery, Cooper University Hospital, New Jersey, United States of America; [2]Department of Surgery Mayo Clinic Arizona, Arizona, United States of America; [3]Department of Surgery, Virtua Memorial Burlington County, New Jersey, United States of America
Correspondence to: Nilay Shah, 5777 E Mayo Blvd, Phoenix, AZ 85054, Tel: +1 (602) 680 8780, Email: shah.nilay1@mayo.edu

Article history

Received: 22 December 2012
Accepted: 17 February 2013
Available online: 17 June 2013

Provenance and Peer Review

Unsolicited and Peer-reviewed

Keywords

Common Iliac Aneurysm
Horseshoe Kidney
Pancreatitis
Endovascular Repair
Blood vessel Prosthesis
Covered Stent
Kidney disease

Abstract

We present the first case of 45 year-old male with an incidental non-symptomatic right common iliac artery pseudoaneurysm with concomitant aortic ectasia in the setting of severe alcoholic pancreatitis and a horseshoe kidney diagnosed by CT and MRA. Such findings would have posed significant difficulty during an open approach precluding safe surgical repair. Therefore, an exclusion endovascular repair of the pseudoaneurysm was employed using a unibody bifurcated endovascular aortic stent-graft to good results. Although not without their complications, endovascular stent-grafts may be life saving to patients who are not candidates for conventional surgical repair. We describe the diagnosis alongside our technique of endovascular repair.

Introduction

Endovascular approaches to repairing various arterial pathologies have become increasingly popular with largely positive results over the last decade.[1] The evolution and development of the various endovascular stent-grafts for abdominal aortic aneurysm exclusion, along with improved stent-graft delivery systems have substituted the conventional surgical repair for life-threatening aortic disease.[2]

About 0.09% of the population have isolated iliac artery anerysms.[3] However, the association of such aorto-iliac disease with horseshoe kidney (HSK) occurs in about 1 in every 400 people (0.15% to 0.8) people.[4,5] The HSK may pose a threat to open approaches.[6] In addition; pancreatitis alone poses a perilous risk for open surgery, with dismal prognosis.[7] Despite their low rupture rates, especially when under 3 cm, patients with iliac artery disease are best offered elective repair to minimize mortality as a standard of care.[8] With their favorable mortality and morbidity figures, and minimal renal complications, endovascular approaches to aorto-iliac pathology should be opted over open surgical techniques especially in the presence of such comorbidities.

To our knowledge, we report the first case of incidental right common artery (CIA) iliac pseudoaneurysm with concomitant aortic ectasia and HSK in a patient with severe alcoholic pancreatitis. The patient's aorto-iliac disease was treated successfully using a unibody bifurcated endovascular aortic stent-graft to good results.

Presentation of Case

A 45-year-old African American male presented to the emergency department with a week history of severe epigastric abdominal pain and protracted emesis in the setting of alcohol abuse. He is a copious smoker with a history of alcoholic pancreatitis, otherwise no other history of note. Initial laboratory investigations showed a hypookalaemia (2.9 mEq/L) with an elevated liver injury profile (Alkaline Phosphatase 144 IU/L, AST 44 IU/L, ALT 25 IU/L) and a raised amylase and lipase (145 IU/L and 1283 IU/L respectively). Electrocardiogram showed T wave inversions in leads V3 to V6, however, cardiac troponins, echocardiography, and persantine stress tests showed no evidence of definite ischemia or infarction. He had an ejection fraction of 37%.

Computed tomography (CT) of the abdomen showed an HSK and bilateral extrarenal pelvis.

There was prominence of the pancreatic duct. A 5 cm rounded, hypo-attenuated mass was seen inferior to the aorto-iliac bifurcation, suspicious for a right CIA pseudoaneurysm. Further testing with Magnetic Resonance Angiography (MRA) showed Gadolinium enhancement of a patent 3.5 cm x 3.5 cm x 4.0 cm pseudoaneurysm of the distal segment of the right CIA with partial thrombosis. The pseudoaneurysm neck measured 1 cm. Neither MRA nor CT demonstrated rupture of the pseudoaneurysm.

With its attending risk of rupture and in the setting of alcoholic pancreatitis, and a CT finding of HSK which preclude safe surgical repair, the patient was offered and elected to undergo endovascular repair.

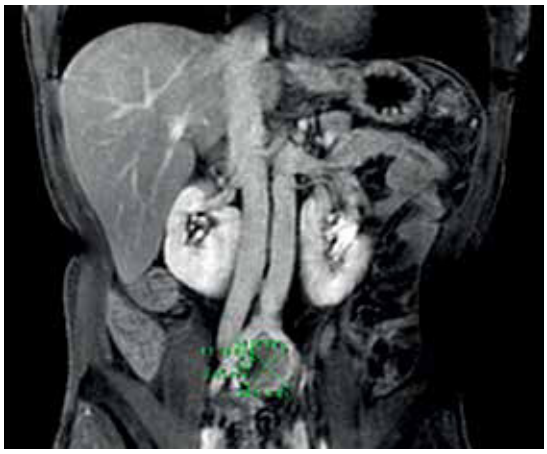

Fig 1 Computerized Tomography Abdomen showing the HSK with extrarenal pelvis. A rounded hypoattenuated mass is seen inferior to the aortoiliac bifurcation susipicious for a right common iliac artery pseudoaneurysm.

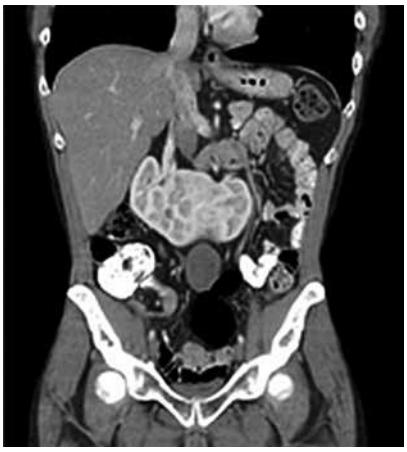

Fig 2 Magnetic Resonance Tomography showing a patent right common iliac pseudoaneurysm with Gadolinium enhancement.

Procedure

After general endotracheal anesthesia and under sterile conditions, initial percutaneous technique was performed through the distal external iliac artery above the inguinal ligament under sonographic guidance. Needle arteriotomy was made followed by catheter placement to allow initial selective arteriography of the right common iliac artery from the external iliac artery and via a pigtail graded catheter into the abdominal aorta. The findings confirmed a pseudoaneurysm arising from the midsegment of the CIA. The right CIA was widened up to 12 mm. Both CIAs were short at 3 cm before the iliac bifurcation. The internal iliacs were small bilaterally.

The abdominal aorta measured 2 cm with an incidental dilatation and ectasia of the distal segment to a diameter of 2.5 cm. Note was made of the HSK which was well perfused through patent renal arteries.

Due to the dilation of the right CIA, and the short size of vessel, it was felt that complete exclusion of the pseudoaneurysm could be sufficiently obtained through conventional simple endovascular covered stent. After 6000 IU of heparin, the decision was then made to employ a unibody bifurcated endovascular aortic stent-graft (Endologix™, Irvine, California, USA) to cover the distal 2/3rd of the aorta to a site about 2/3rd along the CIA. The stent-graft was deployed without complications. Imaging at completion showed persistence of the pseudoaneurysm, which did not appear to be from the covered area of the iliac origin of the pseudoaneurysm, but was from collateral flow from the right internal iliac artery. It was, therefore, decided to deploy a covered tapered stent extending to the proximal external iliac artery, excluding the right internal iliac artery. This was followed by balloon angioplasty.

This corrected the pseudoaneurysm while preserving the left CIA and both renal arteries. The ectatic portion of the distal aorta was also covered safely. A patch angioplasty using bovine pericardium was utilized to close the right external iliac artery. There were palpable pulses in femoral, popliteal, and foot pulses bilaterally after the procedure.

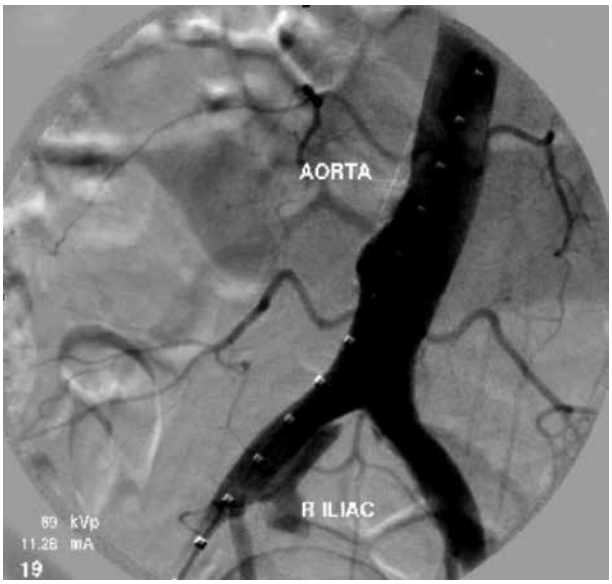

Fig 3 Digital Subtraction Angiography depicting an ectatic distal aorta short common iliac arteries with a right common iliac artery pseudoaneurysm. A silhouette of the HSK is seen with patent renal arteries.

Discussion

To our knowledge, we report the first case of incidental right CIA pseudoaneurysm with concomitant aortic ectasia and HSK in a patient with severe alcoholic pancreatitis. In this case, access from the right femoral artery, using a simple covered iliac stent, may not have adequately excluded the pseudoaneurysm proximally; hence a bifurcated aortic stent was employed.

Since Parodi's first successful endovascular exclusion of an abdominal aortic aneurysm (AAA), transfemoral endovascular approaches have become popular for the repair of various arterial pathologies.[9] Endovascular treatment of iliac pseudoaneurysms has evolved from the use of endovascular stents alone,[10] to grafted stents,[11] and stents in combination with coils.[12] Covered stents were also employed with promising results.[13] Collectively, these approaches have spared patients the traditional surgical excision and artery repair of conventional treatments. Those procedures are often long and complicated, some involving lateral suture for narrow necked

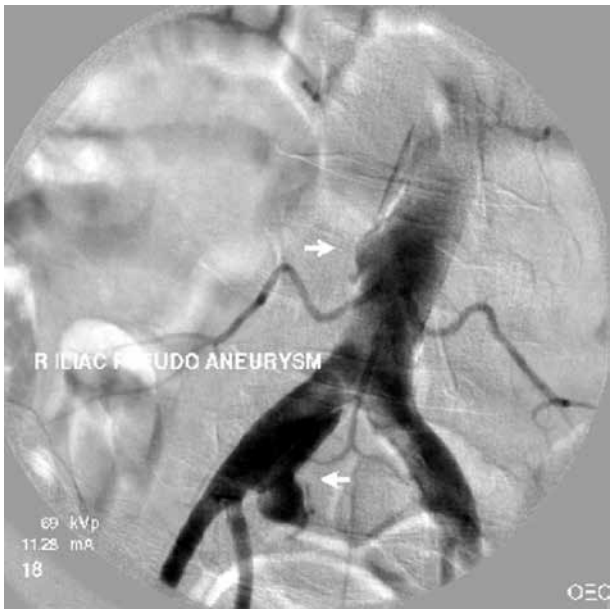

Fig 4 Angiography depicting an ecstatic distal aorta to 2.5 cm and short common iliac arteries with a right common iliac pseudoaneurysm.

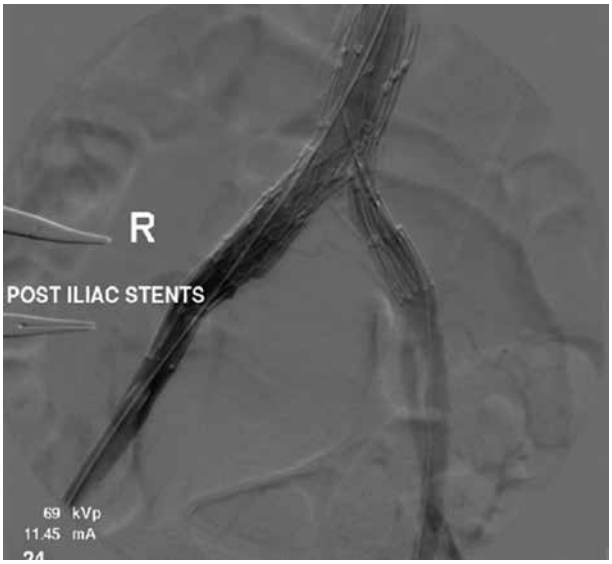

Fig 5 Digital Subtraction Angiography post procedure showing a corrected right common iliac artery pseudoaneurysm, covered aortic ectasia and preserved Left common iliac artery.

aneurysms, patch angioplasty, or interposition graft for those with wider necks.

Although horseshoe kidneys are rare, pre-operative assessment of renal anatomy and its vasculature by various imaging modalities is crucial to avoid post-intervention renal compromise. In this case, the size of the pseudoaneurysm and the pre-operative anatomic studies favored an endovascular repair. When faced with aorto-iliac disease and an HSK, it is crucial to amend the diseased artery without compromise in renal function.

Endovascular repair is an attractive option to treat patients with isolated CIA pseudoaneurysms in the presence of anatomical hindrances that would preclude safe surgical repair, such as an HSK. It offers a minimally invasive procedure which minimizes the cardio-respiratory stress seen in open surgery. With its low morbidity and mortality figures, and short hospital stays, endovascular treatments of life-threatening aorto-iliac disease should always be sought as a primary modality of therapy.

Ethical approval

Consent was obtained from patient detailed in this report.

Conflict of interest

No conflicts of interest have been declared by the author.

Authors contribution

AF – Performed surgery, drafting manuscript, final approval.

NS – Assisted manuscript draft, critical revision, final approval.

TB – Performed surgery, project supervision, critical revision, final approval project, revision of manuscript.

Funding

No funding source declared by the authors.

1 Gravereaux EC, Marin ML. Endovascular repair of diffuse atherosclerotic occlusive disease using stented grafts. Mt Sinai J Med 2003;70:410–7.
2 Carpenter JP, Garcia MJ, Harlin SA, et al. Contemporary results of endovascular repair of abdominal aortic aneurysms: effect of anatomical fixation on outcomes. J Endovasc Ther 2010;17(2):153–62.
3 Brunkwall J, Hauksson H, Bengtsson H, Bergqvist D, Takolander R, Bergentz SE. Solitary aneurysms of the iliac arterial system: an estimate of their frequency of occurrence. J Vasc Surg 1989;10:381–4.
4 Bomalaski MD, Gardner AL, Madison DL. Aortic surgery complicated by horseshoe kidney. Indiana Med 1988;81(8):688–93.
5 Saadi EK, Dussin LH, Moura Ld, Zago AJ. Endovascular repair of an abdominal aortic aneurysm in patient with horseshoe kidney: a case report. Rev Bras Cir Cardiovasc 2008;23(3):425–8.
6 Ezzet F, Dorazio R, Herzberg R. Horseshoe and pelvic kidneys associated with abdominal aortic aneurysms. Am J Surg 1977;134(2):196–8.
7 Dervenis C, Johnson CD, Bassi C, et al. Diagnosis, objective assessment of severity, and management of acute pancreatitis. Int J Pancreatol 1999;25:195–200.
8 McCready RA, Pairolero PC, Gilmore JC, Kazmier FJ, Cherry KJ Jr, Hollier LH. Isolated iliac artery aneurysms. Surgery 1983;93:688–93.
9 Parodi JC, Palmaz JC, Barone HD. Transfemoral intraluminal graft implantation for abdominal aortic aneurysms. Ann Vasc Surg 1991;5:491–9.
10 Lugmayr H, Hartl P, Schwarz C, Zisch R. Stent implantation in solitary aneurysm of the common iliac artery. Dtsch Med Wochenschr 1993;118(14):499–502.
11 Marin ML, Veith FJ, Panetta TF, et al. Transluminally placed endovascular stented graft repair for arterial trauma. J Vasc Surg 1994;20(3):466–73.
12 O'Brien CJ, Rankin RN. Percutaneous management of large-neck pseudoaneurysms with arterial stent placement and coil embolization. J Vasc Interv Radiol 1994;5(3):443–8.
13 Klonaris C, Verikokos C, Avgerinos ED, Bellos J, Katsargyris A, Liapis CD. Stent-graft repair of isolated iliac aneurysms with wide or ectatic necks with use of inverted zenith device legs. J Vasc Interv Radiol 2009;20(3):403–6.