

Endovascular Treatment of Celiac Artery Aneurysm with a Covered Stent: Case Presentation and Review of the Literature

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Objectives: Celiac artery aneurysm is one of the rarest visceral arterial aneurysms (<5% of cases). Management has traditionally involved open repair (aneurysmorrhaphy or ligation) to prevent its rupture, which is thought to occur approximately 15%-20% of cases. Endovascular options, including embolization, percutaneous thrombin injection, and aortic and celiac axis stent grafting have been described in the literature. Herein, we present the successful repair of an asymptomatic celiac artery aneurysm involving endovascular aneurysm repair of the celiac axis and coil embolization of the splenic and left gastric arteries.

Methods: Preoperative planning involved fine-cut computed tomographic angiography reformatted using TeraRecon software (TeraRecon, Inc, Foster City, Calif) to accurately size the proposed endograft. Endovascular repair was performed through a left brachial approach (6F system) involving micro coil embolization (Cook Medical, Inc, Bloomington, Ind) of the splenic and left gastric arteries, and placement of a Viabahn stent graft (W. L. Gore and Associates, Inc, Flagstaff, Ariz) from the origin of the celiac axis landing into the common hepatic artery. A review of the literature was performed.

Results: Initial arteriogram (Fig 1) revealed the celiac aneurysm and completion arteriography (Fig 2) demonstrated successful exclusion of the celiac aneurysm without evidence of endoleak. The patient was discharged postoperative day 1 in excellent condition, with normal liver function tests. Follow-up at three months revealed complete exclusion of the aneurysm by duplex imaging. A PUBMED literature search revealed the most common endovascular approach was coil embolization of the aneurysm (six cases); celiac aneurysm stent graft exclusion has been reported only in three cases; celiac axis-hepatic artery stent graft placement, reported herein, has been described only once previously.

Conclusions: Celiac axis aneurysm is a rare type of splanchnic aneurysm with high rupture rate. Endovascular treatment requires careful preoperative planning and results in successful treatment via a minimally invasive approach. When the aneurysm involves the distal celiac axis, EVAR combined with selective embolization offers exclusion of the aneurysm along with maintenance of in-line blood flow to the liver.

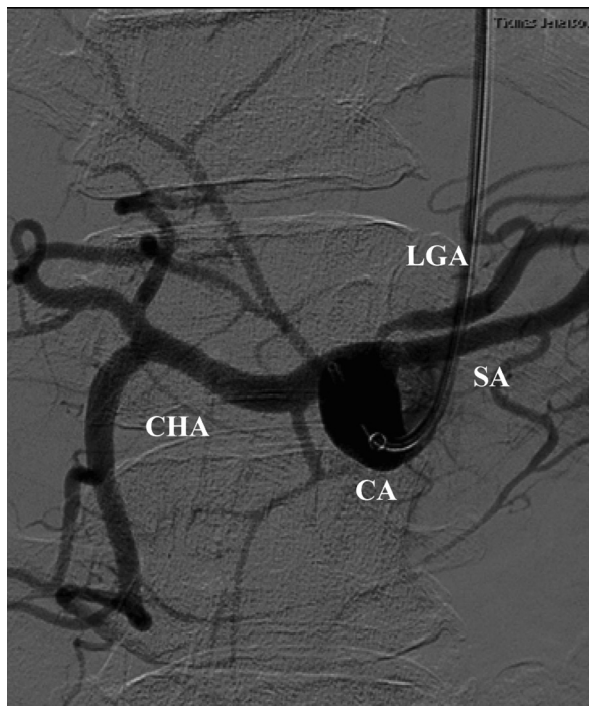


Fig 1. Angiogram of celiac axis demonstrating 1.8 cm aneurysm. CA, Celiac axis; CHA, common hepatic artery; LGA, left gastric artery; SA, splenic artery.



Fig 2. Completion Angiogram demonstrating successful exclusion of the celiac aneurysm.

Ex Vivo Repair of Renal Artery Aneurysms

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Objectives: Renal artery aneurysms (RAAs) are rare but remain challenging lesions when treatment is required. Endovascular techniques may offer less invasive options in some cases, but in many RAAs the distal or hilar location of the aneurysm makes open surgical repair the only option. Ex vivo RAA repair with aortorenal bypass and cold renal preservation remains the definitive surgical treatment for these more complex distal lesions. This study was a retrospective review of a single center experience with ex vivo surgical treatment of 14 complex RAAs and their clinical outcomes.

Methods: From January 1997 through January 2013, 14 consecutive patients had RAAs repaired using ex vivo technique with cold renal perfusion. Demographic data, comorbidities, pre- and postoperative imaging, blood pressure, and renal function data, as well as operative details were collected. Patency of repair and durability was followed with renal duplex sonography.

Results: Fourteen RAAs were repaired in 10 women and four men (average age 54 years). Preoperative hypertension was present in 12 (86%) requiring an average of three antihypertensive medications. Four patients (29%) were active smokers. Renal insufficiency (creatinine >1.3 mg/dL) was present in 14%; the mean serum creatinine for the group was 0.9 mg/dL. Six RAA (43%) were symptomatic. Aneurysm size averaged 2.88 cm (range, 1.3-5.3 cm). All reconstructions were performed with autogenous saphenous vein aortorenal bypass. No patient required concomitant aortic reconstruction. RAA repair and kidney salvage was successful in 12 cases; two patients required nephrectomy due to unreconstructable renal branch anatomy. There were no perioperative deaths, and average length of stay was 8 days. Hypertension was clinically unchanged in all patients. The two patients with pre-existing renal insufficiency had renal function improved postoperatively. No patient required either temporary or permanent dialysis. Follow-up with sonography was available in all patients with a mean follow-up of 17 months (0.5-49 months), and showed a patency of 100%.

Conclusions: Open ex vivo surgical repair with aortorenal bypass was a successful and durable treatment for complex distal RAAs that require repair. These procedures had low morbidity and mortality and an excellent rate of preservation of renal function. However, blood pressure control in these patients did not appear to change significantly following RRA repair.