JRMI
Journal of Rehman Medical Institute

Volume 4, No. 2
April - June 2018
www.jrmi.pk

CASE REPORT

Embolization of splenic artery aneurysm and pseudoaneurysm

Aman Nawaz Khan, Muhammad Asif, Ummara Siddique Umer, Syed Ghulam Ghaus, Shahjehan Alam, Mahwish Jabeen

Submitted
May 07, 2018
Accepted
May 22, 2018

Author Information
From: Department of Radiology, Rehman Medical institute (RMI), Peshawar, Khyber Pakhtunkhwa, Pakistan

Dr. Aman Nawaz Khan
Interventional Radiologist

Dr. Muhammad Asif
Trainee Medical Officer

Dr. Ummara Siddique Umer
Assistant Professor
(Corresponding Author)
Email:
ummara_81@hotmail.com

Dr. Syed Ghulam Ghaus
Associate Professor

Dr. Shahjehan Alam
Associate Professor

Dr. Mahwish Jabeen
Assistant Professor

Citation: Khan AN, Asif M, Umer US, Ghaus SG, Alam S, Jabeen M. Embolization of splenic artery aneurysm and pseudoaneurysm. (Case Report). J Rehman Med Inst. 2018 Apr-Jun;4(2):24-6.

ABSTRACT

The previously clinically silent and rare splenic artery aneurysms are now being detected more frequently due to the use of Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) techniques. The advent of Percutaneous Endovascular Embolization procedure has further made treatment of these conditions possible and safer, though with varying success rates. The combined detection and treatment possibilities have thereby decreased the chances of sudden rupture as a clinical presentation. Two cases of splenic artery aneurysm are presented, both successfully treated with Percutaneous Embolization.

Keywords: Splenic Artery; Aneurysm; Tomography, Emission-Computed; Magnetic Resonance Imaging.

Clinical Relevance: Diagnosis of splenic artery aneurysms through Computed Tomography and Magnetic Resonance Imaging are to be encouraged; treatment of the condition by Percutaneous Endovascular Embolization offers a safe and effective treatment modality.

The authors declared no conflict of interest. All authors contributed substantially to the planning of research, data collection, data analysis, and write-up of the article, and agreed to be accountable for all aspects of the work.

INTRODUCTION

Splenic artery aneurysm is the 3rd most common intra-abdominal aneurysm after abdominal aortic and iliac artery aneurysm,[1] more commonly located in the distal third of the splenic artery (75%) and 20% in middle third segment.[2] The true prevalence of it is unknown but has been reported 0.8–1% prevalence in arteriography and 0.001–0.2% in autopsy series.[1,3] Due to advancement and common practice of computed tomography (CT) and Magnetic Resonance Imaging (MRI) nowadays has increased the detection rate of clinically silent true splenic artery aneurysms.[4] However recently, percutaneous endovascular embolization procedure has gained popularity, and it is now performed as the first-line treatment for splenic artery aneurysms. Although no randomized controlled trials have assessed the safety and efficacy of endovascular embolization, there have been several case reports and small or generalized retrospective reviews.

To prevent the risk of rupture, ACC/AHA guidelines suggested that treatment should be done in asymptomatic aneurysm larger than 2 cm.[5] Additionally, treatment is highly indicated in patients with symptomatic aneurysm, pregnancy and portal hypertension even if the aneurysm is smaller than 2 cm.[1,6]

We present two cases with splenic artery aneurysm treated successfully by percutaneous embolization at our center.

CASE # 01

The first case report is of a 62-year-old female patient who was referred to our radiology department in May 2017 by clinician for imaging. A known case of thalassemia (Hb A- 95% and Hb A2- 4.7%), she presented to our hospital with chief complaints of left flank pain and epigastric pain for one month. She had no other significant past surgical history. All general and systemic examination findings were normal except deep tenderness in left upper abdomen. All laboratory tests (CBC, RFT, Urine R/E, and INR) were within normal limits except mild anemia (Hb: 10.5 g/dl). Contrast Enhanced Computed Tomography (CECT) scan of the abdomen was performed on 128 slice CT which showed aneurysm in splenic artery

proximal to splenic hilar level measuring 2.2 x 2 cm with patchy peripheral focal calcification; no intraluminal thrombus or dissection was seen. The patient was then referred to Interventional Radiology Department for percutaneous embolization of splenic artery aneurysm. The patient was scheduled for endovascular intervention.

A right common femoral artery approach was performed under local anesthesia; a 5-French sheath was placed. Selective angiography of the splenic artery was done using 5-French catheter which revealed splenic artery aneurysm at hilar level. The aneurysm was crossed with microcatheter and 2 x 8 mm (tornado) coils and 01 x 6 mm (Auzar) coil deployed to occlude the distal end of the splenic artery. Aneurysm was then packed with 3 x 10 mm nester coils and proximal inflow was occluded with 8 mm nester coils. Post-embolization angiogram revealed successful embolization of the splenic artery with non-filling of the aneurysm without any immediate complications. Patient was advised bed rest and his vitals were monitored hourly for next 04 hours. At the time of discharge patient was vitally stable. After 02 weeks, patient presented with complaints of right hypochondrium pain & fever. She was advised CT Liver Dynamic scan, which showed large splenic infarct with partial thrombosis in splenic vein and right portal vein branches leading to infarct of corresponding hepatic segments. Additional finding of pulmonary embolism was noted in left upper lung and bilateral segmental lower lung branches. Patient was anticoagulated and improved. After 2 months, follow up ultrasound abdomen demonstrated splenic infarct with no other significant abnormality.

CASE # 02

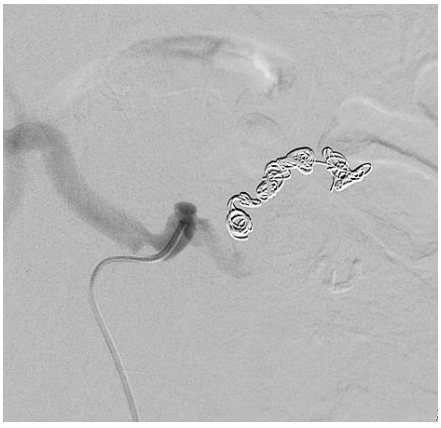
Second case report is of a 48-year-old male patient who was, previously diagnosed as a case of acute necrotizing pancreatitis and two operations were done for necrosectomy in KSA, referred to our hospital in January 2018 with symptoms of upper GI bleed. Patient also had a past history of recurrent epistaxis for which embolization of maxillary artery branch was done effectively. At the time of admission, the advised lab investigations, (CBC, INR and RFTs), were within normal limits except Hb- 5.6g/dl and INR- 1.91.

Computed Tomography pancreas dynamic scan was done with mesenteric angiogram of upper abdomen, which showed large fluid-collection in pancreatic region involving pancreatic body and tail with mesenteric fat stranding. These were encasing the splenic artery with a 13 mm pseudoaneurysm. A small AVM in 2nd left branch of SMA was also noted. Rest of the major abdominal vessels were normal. The patient was then referred to Interventional Radiology department for embolization of splenic artery pseudoaneurysm. The patient was scheduled for the interventional procedure after giving 03 units of blood and 04 units of FFP in order to correct his anemia and bleeding profile.

A right common femoral artery approach was performed under local anesthesia; a 5-French sheath was placed. Selective angiography of the splenic artery was done which verified the above findings. Splenic artery was embolized with 6 coils (10 mm to 6 mm, Nester and Tornado) followed by Gelfoam embolization. The pseudoaneurysm was effectively occluded with coils. The small AVM was also embolized with 2-3 mm coils. Post-embolization angiogram showed successful embolization of the splenic artery and pseudoaneurysm. After the procedure, patient was advised bed rest (06 hours) and his vitals were monitored hourly for the next 4 hours. Blood transfusion was continued with further 02 units. At the time of discharge CBC, INR and creatinine were reviewed (Hb- 9.7g/dl, INR- 1.05, Creatinine - 0.57mg/dl). On follow-up, patient had no complications.

(A)

(B)



(C)

Figure 1: (a) Initial CT scan image showing large fluid collection in pancreatic region and encasement of splenic artery with a pseudoaneurysm. (b) Pre-embolization, Selective angiogram showing splenic artery with pseudoaneurysm. (c) Angiogram image showing successful embolization of the splenic artery and pseudoaneurysm.

DISCUSSION

Splenic artery aneurysms (SpAA) are the most common visceral arterial aneurysm, accounting for about 60% and their exact cause is unknown. Pregnancy, portal hypertension, cirrhosis, liver transplantation, hypertension, atherosclerosis, medial fibrodysplasia, splenomegaly, pancreatic pseudocyst, vascular collagen disorders are the likely risk factors for the development of SpAA.[1,6,7] It is reported that its prevalence is 0.8–1% in arteriography and 0.001–0.2% in autopsy series.[1,3] The SpAA prevalence documented is low due to its asymptomatic nature, but risk of rupture increases in aneurysms larger than 2 cm and risk increases from 2% to 10% in presence of portal hypertension, in liver transplant patients and during pregnancy.[1,3,6]

Diagnosis of SpAA can be made by CECT scanning, ultrasonography, pulsed Doppler, magnetic resonance imaging, magnetic resonance angiography and abdominal aortic arteriography. Several ways for the management of SpAA have been reported in the literature. Traditional treatment options are open surgical intervention, including aneurysm ligation with or without splenectomy and aneurysmal resection with revascularization. With the advancement of health technology, management options include the use of laparoscopic surgery and nonsurgical endovascular management.[11] So, the treatment of choice for SpAA has now changed from either open surgery or laparoscopic surgery to transcatheter embolization.

Endovascular treatment should be the first-line treatment for all SpAA because of its safety, lower mortality, and sufficient short- and long-term results. In the literature the technique of embolization varies, majority of the centers use coils and Microcoils as embolization material, sometimes, with addition of glue. Techniques differs between the embolization of aneurysm (small & medium sized) itself and embolization of afferent & efferent vessels in case of large aneurysmal sac.[7] The embolization with coils and Microcoils is technique of choice because embolization of ruptured SpAA ensure immediate control of bleeding and can be applied regardless of the SpAA location, etiology and clinical presentation as well as patient's general health.[8]

In both our cases of splenic artery aneurysm (true and pseudoaneurysm), the embolization of the entire splenic artery, distal & proximal, was done using coils, Microcoils and Gelfoam under local anesthesia. However, spleen has rich collateral and short gastric artery feeding; it is reported that this may develop splenic infarct and Postembolization syndrome.[3,9] Postembolization syndrome consists of abdominal pain, fever, and vomiting. We did not observe Postembolization syndrome in both of our patients.

Li et al[3] performed aneurysm repair in 35 patients with SpAA by preserving splenic artery in some of them and occluded splenic artery in the majority patients.[5] Their patients developed Postembolization syndrome seen in 15% of patients with preserved splenic artery and 37% of the patients where they did not preserve the main artery. However, they reported no splenic artery insufficiency in both groups, and it is safe to perform embolization in splenic artery. Xin described the reports of endovascular management of 12 true aneurysms and pseudoaneurysm, with a 100% efficacy and splenic infarction and postembolization syndrome were observed in 66% of cases.[10]

Endovascular procedures are effective in management of splenic artery aneurysms and much safer than open surgery. Technical problems ensuing from atypical anatomical conditions may arise during endovascular procedures, although such situations are rare. In case of giant aneurysms stent graft embolization seems to be the best treatment method due to a low risk of dangerous complications and high efficacy.[6]

CONCLUSION

Endovascular management of splenic artery aneurysm at Rehman Medical Institute, Peshawar, showed technical success related to case individualization and treatment decisions based on patient anatomy, size of the aneurysm and general patient condition. The minimal invasive approach of catheter-based treatment demonstrated technical success and safety thereby reducing patient exposure to surgical morbidity and mortality.

REFERENCES

1. Rahman A, Shabkah A, Hassanain M, Aljiffry M. Ruptured spontaneous splenic artery aneurysm: A case report and review of the literature. Int J Surg Case Rep. 2014;5(10):754–7.
2. Mohan IV, Stephen MS. Peripheral arterial aneurysms: open or endovascular surgery? Prog Cardiovasc Dis. 2013:56:36-56.
3. Er-Sheng Li, Ji-Xing Mu, Shuan-Meng Ji, Xiao-Min Li, Lan-Bin Xu, Tian-Chang Chai, et al. Total splenic artery embolization for splenic artery aneurysms in patients with normal spleen. World J Gastroenterol. 2014;20(2):555–60.
4. Røkke O, Søndenaa K, Amundsen S, Bjerke-Larssen T, Jensen D. The diagnosis and management of splanchnic artery aneurysms. Scan J Gastroenterol. 2009;31(8):737-43.
5. Marmagkiolis K, Gobal F, Mego D, Cilingiroglu M, Rollefson W. Endovascular management of splenic arterial aneurysms. (Letter to the Editor). International Journal of Cardiology. 2014;174(1):146-9.
6. Kuklinski A, Batycki K, Matuszewski W, Ostrach A, Kupis Z, Legowik T. Embolisation of a large, symptomatic splenic artery pseudoaneurysm. Pol J Radiol. 2014;79:194-8.
7. Patel A, Weintraub JL, Nowakowski FS, Kim E, Fischman AM, Ellozy SH, et al. Single-center experience with elective transcatheter coil embolization of splenic artery aneurysms: technique and midterm follow-up. J Vasc Interv Radiol. 2012;23:893-9.
8. Loffroy R, Guiu B, Cercueil JP, Lepage C, Cheynel N, Steinmetz E, et al. Transcatheter arterial embolization of splenic artery aneurysms and pseudoaneurysms: short- and long-term results. Ann Vasc Surg. 2008;22(5):618-26.
9. Rogriguez-Caulo EA, Araji O, Miranda N, Tellez JC, Velazquez C. Fusiform giant splenic artery aneurysm. (Letter to the Editor). Cirugia Espanola. 2014;92(3):215-6.
10. Xin J, Xiao-Ping L, Wei G, Jiang X, Hong-Peng Z, Xiao-Hui Ma, et al: The endovascular management of splenic artery aneurysms and pseudoaneurysms. Vascular. 2011;19(5):257-61.
11. Kim JH, Chung HS, Kim JH, Park SY, Lee SB, Byung SD. Splenic artery aneurysm with the double-rupture phenomenon. Clin Exp Emerg Med. 2017;4(2):113-6.