WHAT WOULD YOU DO?

Incidental Splenic Artery Aneurysm on CT Imaging

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CASE PRESENTATION

A 37-year-old woman undergoes CT for pulmonary embolism, and a 2.9-cm splenic artery aneurysm is incidentally found (Figure 1).

How would you manage this incidental finding and why?

Dr. Kumar: Splenic artery aneurysms occur more commonly in women than men, and while the patient is asymptomatic, her risk of rupture increases as the diameter exceeds 2 cm. Given the aneurysm size and unknown desire for future pregnancy, which would increase her risk of rupture, prophylactic embolization would be our recommendation. Prior to the procedure, all questions and concerns the patient might have should be addressed during an interventional radiology clinic visit.

Dr. Madassery: In our practice, I would have the patient come to our interventional radiology clinic to receive a full evaluation and discuss the options. Although splenic artery aneurysms are many times incidentally found, even at this size, they can cause underlying epigastric pain. Her family history of aneurysms and possible collagen vascular disease, if any, would be important to know, which increases the risk for growth and rupture. Based on the reported size, I would recommend aneurysm embolization, as our size threshold in nonsymptomatic patients is 2 cm and in general the rupture risk increases with aneurysms > 2 cm. Until the aneurysm is treated successfully, I would recommend that she not get pregnant if that is being considered. I would also discuss the expectations of the procedure and the necessary follow-up.

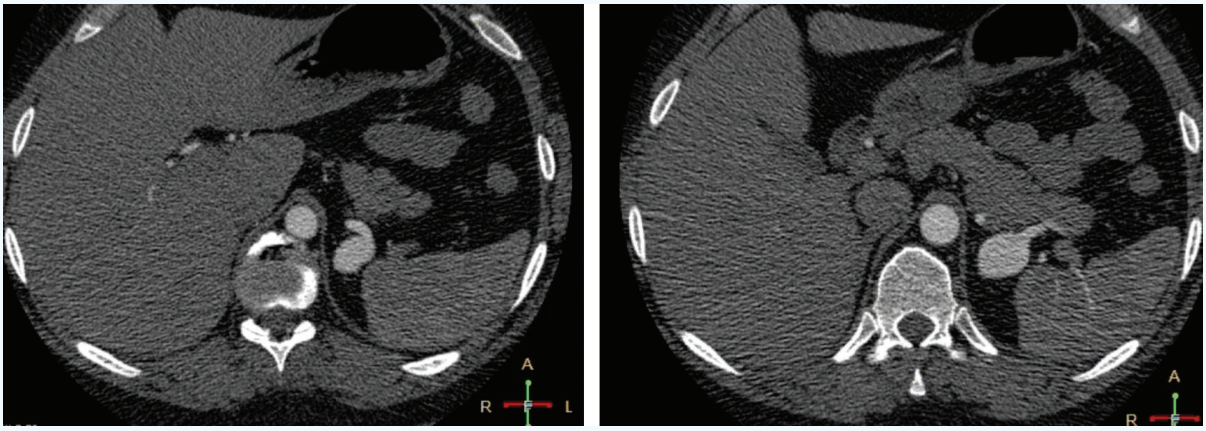

Figure 1. Contrast-enhanced axial CT demonstrates a 2.9-cm splenic artery aneurysm.

Dr. Pabon-Ramos: Given the patient's age, sex, aneurysm diameter (> 2 cm), and lack of calcification along the periphery of the aneurysm, this aneurysm is likely to increase in diameter over time and therefore be at a higher risk for rupture. I would embolize it now.

If you decide to treat this aneurysm, what embolization tools, methods, and/or approach would you use?

Dr. Madassery: When I plan for a splenic artery aneurysm case, the most important technical considerations are the location of the aneurysm and its shape. If the aneurysm has a neck and it is proximal or not in a tortuous path, then a covered stent graft would be considered. If the aneurysm is distal and/or the anatomy is tortuous, then I would consider coil embolization or plug device (Amplatzer vascular plug [AVP; Abbott Vascular, formerly St. Jude Medical] or MVP microvascular plug [Medtronic]) placement distal to and proximal from the aneurysm, with tight coil of the aneurysm sac. As for access and support, usually I would access the common femoral artery with a 5-F, 45-cm sheath and then select the celiac artery with a Cobra-2 catheter. After celiac arteriography is performed, I would advance a Glidewire (Terumo Interventional Systems) into the splenic artery and then exchange the Cobra-2 catheter for a 4-F Glidecath (Terumo Interventional Systems), which will be positioned just proximal to the aneurysm. After obtaining splenic arteriograms in multiple projections, if the Glidecath can be advanced past the sac to the outflow, I would deploy a AVP 4 plug. If only a microcatheter would navigate the system, I would use a 2.8-F microcatheter distal to the aneurysm and then advance and unsheath a MVP-5Q device. Prior to release, contrast would be injected through the Tuohy to confirm satisfactory positioning, and then the plug would be released. Next, the aneurysmal portion of the splenic artery would be embolized with detachable coils, usually with Ruby Soft and Packing Coils (Penumbra, Inc.). Once the tight pack is formed, I would remove the microcatheter and would advance and deploy an AVP 4 plug. This same technique can be done from the radial artery approach.

Dr. Pabon-Ramos: The approach would be radial or femoral, depending on the takeoff of the celiac trunk on the CT scan and radial artery evaluation. I would perform splenic arteriograms in multiple projections to delineate aneurysm inflow and outflow and anatomic relationship to pancreatic branches. I would then embolize the outflow vessel(s), aneurysm sac, and inflow vessel(s) with coils or coils for the outflow vessel(s) and ethylene vinyl alcohol (EVOH) copolymer liquid embolic agent for the aneurysm sac and inflow vessel(s). The tools would depend on the relationship between the aneurysm, inflow and outflow vessel(s), and pancreatic branches, as well as estimated cost (ie, number of coils vs number of vials of EVOH).

Dr. Kumar: Our approach would focus on the anatomy of the splenic artery and whether we could safely deploy a covered stent graft across the aneurysm. If the aneurysm neck was small, transcatheter embolization of the sac could potentially be performed, preferably with detachable coils. If the anatomy proved tortuous, however, then embolization of the main splenic artery, including proximal and distal to the aneurysm, would be required. Utilization of coils and/or MVPs would be our preferred method of embolization. We would avoid particles to minimize nontarget embolization. Liquid embolics could be used in a flow-controlled setting.

What type of postprocedure follow-up would you recommend for this patient?

Dr. Pabon-Ramos: One-month CT with contrast and a clinic visit to evaluate for resolution of postembolization syndrome, any increase in aneurysm diameter, and any potential splenic infection/abscess clinically and on imaging. Then, I would order surveillance CT with contrast at 3 to 6, 12, and 24 months.

Dr. Kumar: Because splenic artery embolization can result in significant postembolization pain up to 1 week, appropriate pain medications should be prescribed before discharge from the hospital. Aside from a single dose of perioperative antibiotic, our practice does not prescribe continued antibiotics after visceral emboliza-

Figure 2. Digital subtraction angiogram shows the splenic artery aneurysm.

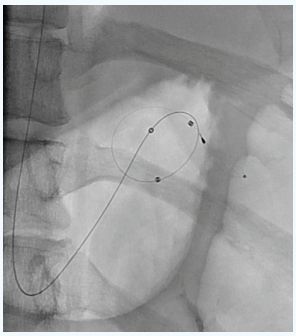

Figure 3. Fluoroscopic image demonstrates deployment of a microvascular plug in the outflow of the splenic aneurysm (distal splenic artery).

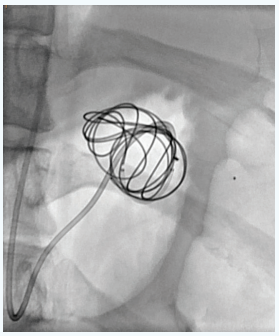

Figure 4. Fluoroscopic image demonstrates deployment of detachable Ruby coils within the aneurysm.

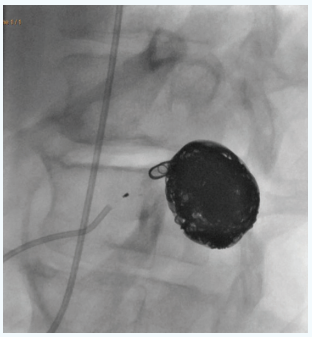

Figure 5. Fluoroscopic image demonstrates deployment of a microvascular plug in the inflow of the splenic aneurysm (proximal splenic artery).

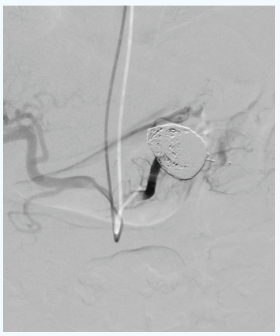

Figure 6. Digital subtraction angiogram demonstrates occlusion of the splenic artery aneurysm.

tion. In addition to a 1-week follow-up clinic appointment, we would recommend a postcontrast CT scan in 4 to 6 weeks to assess complete occlusion of the aneurysm sac and determine if compaction has occurred. If the embolization appears successful, additional follow-up cross-sectional imaging is unnecessary and would help to ensure minimization of ionization radiation dose to an otherwise healthy female patient.

Dr. Madassery: This patient would be discharged with 5 days of broad-spectrum oral antibiotics, methylprednisolone, and pain control medications if necessary. She would be seen in clinic 2 weeks postprocedure for an evaluation and wellness check. At 1-month postprocedure, an enhanced CT scan would be performed to evaluate the postembolization appearance of the spleen. Also, basic labs will also be obtained at this visit.

RATIONALE AND EXPLANATION OF CASE

Left radial access was obtained. The splenic artery was selected with a Sarah catheter. Preprocedure angiography was performed in multiple obliquities to lay out the splenic artery aneurysm inflow and outflow (Figure 2). Attempts were made to access the outflow and exclude the aneurysm with a stent graft, but no stable access was possible in the outflow. A 7-mm microvascular plug was then placed in the outflow when a portion was selected (Figure 3). Then, the aneurysm was embolized with 14 long detachable Ruby coils of multiple sizes, and ultimately, a 5-mm microvascular plug was deployed in the inflow vessel (Figures 4 and 5). The postprocedure angiogram demonstrated occlusion of the aneurysm (Figure 6).

One-month follow-up CT demonstrated no significant infarct in the spleen (30% of the upper pole). The patient did not have any postprocedural pain. ■

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