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Abstract
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Reference

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Embolization of a Large Rapidly Growing Aortic Pseudo-Aneurysm Not Amenable to Open or Endovascular Repair

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Background: To report the case of a rapidly growing aortic false aneurysm because of Q fever infection that was managed by embolization.

Case report: An 80-year-old man was admitted to our unit for an aortic false aneurysm from a chronic Q fever infection. During his stay, the aneurysm showed rapid progression necessitating urgent treatment. The patient was unfit for surgical repair; moreover, the location of the aneurysm at the level of the superior mesenteric artery prohibited the use of an endovascular graft. He was managed by coiling of the aneurysmal cavity with multiple detachable coils after positioning of a bare aortic stent to lock the coils and prevent their migration into the aortic lumen. The false aneurysm was successfully thrombosed with no complications. The patient was then put on doxycycline and hydroxychloroquine to target Coxiella burnetii.

Conclusions: Aortic false aneurysm coiling is feasible in cases where an endograft is not possible or an open repair is contraindicated. The use of a bare metal stent may help as a barrier to prevent the coils from migrating into the aneurysm and thus avoiding embolization into the systemic circulation.

Chronic vascular infection with Q fever is a very rare disease with a large spectrum of vascular pathologies. Aortic false aneurysms (FA) account for one of those pathologies; they are likely to progress and rupture if they are left untreated with an associated high mortality. We report the case of an aortic FA that turned up to be caused by an infection with Coxiella burnetii. The FA was managed by coiling to induce thrombosis and avoid rupture along with targeted antibiotics to treat the infection.

CASE REPORT

An 80-year-old man was admitted to the internal medicine unit after severe weight loss and asthenia of 1-month duration. His medical history was relevant for ischemic heart disease, congestive heart failure (due to a severe aortic stenosis but with normal ejection fraction), and adrenal insufficiency after an infection with Mycobacterium tuberculosis 20 years ago. He is also known to have an aortic FA of 1.5 cm on the posterior wall of the aorta at the level of the superior mesenteric artery (SMA). This FA was detected on a computed tomography (CT) scan 8 years before this admission, but no investigation was made to determine its origin and no further follow-up was performed since.

On admission, his blood work-up revealed a hematocrit level of 33% with normal leucocyte count and a C-reactive protein of 7.5. An abdominal ultrasound was first performed; it showed multiple para-aortic lymph nodes and an aortic FA. A CT scan coupled with a positron emission tomography followed, it revealed an increase in the size of his FA that reaches 2 cm in diameter, and it also revealed many hypermetabolic para-aortic lymph nodes at the level of the FA with erosion of the adjacent vertebral body (Fig. 1).
The diagnosis of a tuberculous mycotic aneurysm was suspected first, and a CT-guided biopsy was scheduled to confirm the diagnosis and to exclude a malignancy. At the first attempt, inadequate material was drawn, and a second biopsy was scheduled a week later. Before the biopsy, a second CT of the abdomen showed a rapid evolution of the FA reaching 3 cm in a 1-week period. The biopsy was deemed too risky and was canceled in fear of an aortic rupture, and the patient was transferred to our unit.

The poor physical condition of the patient precluded an open repair. Moreover, with the position of the FA at the mesenteric aorta, the use of an endograft was not possible. We decided to embolize the aneurysm with multiple coils and place a bare stent in the aorta to keep the coils from entering the aortic lumen.

Under local anesthesia, a 14-French percutaneous access was obtained on the right groin and a 6-French long flexor sheath (Cook, Bloomington, IN, USA) from the left, and its tip was brought up into the FA. A 28-mm aortic bare stent of 100 mm in length (Jotec GmbH, Hechingen, Germany) was deployed from the level of the celiac trunk proximally till the infrarenal aorta distally. The aneurysm was then embolized with multiple coils through the previously positioned flexor sheath. In all, 16 IDC coils (Boston scientific, Natick, MA, USA) of 10 mm diameter and two 12 mm Amplatzer plugs (St Jude medical, St. Paul, MN, USA) were used to seal the cavity (Fig. 2).

Serologies for HIV, toxoplasmosis, Lyme disease, brucellosis, cytomegalovirus, and tuberculosis all came negative. At the end, Q fever serology was ordered and came highly positive for phase I (IgG > 5120, IgM < 20) confirming the diagnosis of chronic Coxiella burnetii infection. The patient was then put on doxycycline and hydroxychloroquine and followed by the infectious diseases team.

The patient was doing well after and gradually regained weight. A control CT scan showed a complete thrombosis of his FA with patent visceral vessels (Fig. 3). After 2 months of treatment, IgG phase I levels were still elevated (5120). The patient was kept on the same regimen and was scheduled for another visit 3 months later.

**DISCUSSION**

Q fever is an infection caused by a strict intracellular pathogen called *Coxiella burnetii*. The incidence of the disease is low and may vary between 0.15 and 0.35/100,000 population per year. Although most of the acute form of the disease is asymptomatic, chronic Q fever involve cardiovascular manifestations such as endocarditis in 60% to 70% of cases and vascular infections such as aneurysms or vascular graft infections in 7%. Up to 11% of patients with acute Q fever evolve to a chronic form of the disease. Specific blood markers for the acute and the chronic phase generally make the diagnosis. No clear guidelines exist as for the treatment of the infection; most cases were treated by a combination of antibiotics including doxycycline, rifampicine, ofloxacin, and hydroxychloroquine.

In a literature search, Wegdam-Blans et al. identified 54 cases with vascular complications related to chronic Q fever infection. Thoracic and abdominal aortic aneurysms were mostly seen, followed by peripheral aneurysms and graft infections. Most patients were treated by surgical resection with a mortality rate of 24%, while those treated conservatively by antibiotics alone had a higher mortality rate (70%). Whether this high mortality rate is attributed to poor patient conditions or to high disease aggressiveness remains unclear. In our case, an open surgical repair was not an option due to...
the frailty of the patient. Moreover, an endovascular approach was not feasible neither due to the position of the aneurysm at the level of the SMA. Hypothetically, proper endovascular treatment of a similar aneurysm requires a fenestrated graft but the rapid progression of the FA gave us no time for a custom-made device.

Embollization of an aortic FA was previously described in patients not amenable to open repair. Most of these described FA were the result of a leakage at the anastomotic site from a previously implanted surgical graft. In a case report published in 2002, Chapot was able to successfully exclude an anastomotic FA at the level of the ascending aorta with the use of retrievable coils.3 Shaji was also successful in excluding an abdominal aortic FA using a plug.4

Other options may be used to seal an FA of the aorta. For instance, a covered graft may seem the simplest technique if enough landing zone is available. In our case, this option was not possible due to the location of the lesion at the level of the SMA. A vascular plug would not seal the FA neither due to the large size of its neck; this is why we choose to embolize it with multiple coils. Moreover, with such neck, we were concerned of the possible migration of the coils into the aorta leading to systemic embolization; the bare stent was used to prevent this complication by working as barrier between the coils and the aortic lumen. Finally, a

Fig. 2. Intraoperative digital subtraction angiography before and after bare stent deployment and embolization, plain X-ray of the treated segment is also shown.

Fig. 3. CT scan 1-month after procedure showing complete thrombosis of the false aneurysm.
chimney graft might have been an option, in a similar way to an endovascular repair of a suprarenal aneurysm, nevertheless, using foreign body materials in cases if infection is generally to be avoided; moreover, the size of the aorta was too small to fit for 2 chimneys (SMA, celiac trunk) and an aortic endograft.

We are aware that longer follow-up is needed and that there is a potential risk of infection of the material deployed. However, our patient was unfit for an open repair, and this technique seems to be a valid alternative. It is still unclear how long antibiotics should be given in such situations. Suggestions in chronic Q fever are to give antibiotics for 1 year to lifelong, and at least until phase 1 IgG normalize, but given that foreign materials were used in our case, indefinite treatment might be required.

In conclusion, aortic FA coiling is feasible in case of nonsuitability for open or endovascular repair. This technique is relatively easily performed with over the shelf material, which makes it readily available for emergency situations.

REFERENCES