

A Creative Approach to Mycotic Abdominal Aortic Aneurysm Secondary to *Coxiella burnetii* Infection

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The association between *Coxiella burnetii* infection, also known as Q fever, and abdominal aortic aneurysms is extremely rare. Most patients with chronic Q fever infection are asymptomatic. We describe a patient with a combined mycotic infra-renal abdominal aortic aneurysm (IRAAA), bilateral iliac artery occlusive disease, lumbar vertebra osteomyelitis, and bilateral large psoas abscess. Only life-threatening conditions were treated during this admission, i.e., the mycotic aneurysm and the psoas abscess. Due to the iliac occlusion, the aneurysm was treated using antegrade deployment (via the left subclavian artery) of a Conformable Gore TAG[®] device, and the abscesses were drained surgically. To the best of our knowledge, endovascular treatment of *Coxiella burnetii*-induced IRAAA mycotic aneurysm has not yet been described in the English medical literature.

PATIENT DESCRIPTION

A 54 year old male prison inmate presented to the outpatient clinic complaining of back pain accompanied by 50 m intermittent claudication in both legs. The patient's symptoms began 2 years prior to his admission and severe back pain developed quite rapidly during the previous few months. The patient had no prior admission or known medical conditions despite heavy tobacco abuse. On

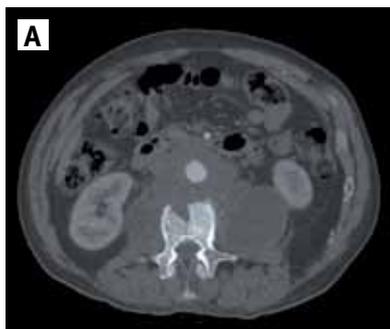
physical examination he was found to be in good health, the only abnormal findings being the absence of all peripheral pulses. Orthopedic and neurological examinations were also normal.

Computed tomography (CT) revealed an infra-renal abdominal aortic aneurysm of 4.5 cm surrounded by inflammatory reaction without clear borders. The right common iliac artery was open extending into the right internal iliac artery, while the right external iliac artery and the left common, internal and external iliac arteries were occluded. Both common femoral arteries were open. Additional findings included destruction of the L3-4 vertebrae as well as large bilateral psoas abscess progressing into the groin [Figures A and B]. The patient denied the presence of fever, night sweats, weight loss, cough, drug abuse, travel, or sexually transmitted infections. During the past years he had worked in the prison carpentry shop and clothing warehouse.

The patient was admitted with a working diagnosis of mycotic, inflammatory IRAAA with tuberculosis being foremost on the differential diagnosis. Blood cultures for aerobic and anaerobic bacteria and

fungi were negative, as was an acid fast test. Positive serologic tests for *Coxiella burnetii* infection were found (titer 1:3200), establishing the diagnosis of Q fever. A gallium scan demonstrated osteomyelitis at the L3-4 vertebrae and severe inflammatory reaction around the aneurysm. White caseous material was aspirated from the psoas abscess on both sides. The patient was started on multiple antibiotics including doxycycline, hydroxychloroquine, metronidazole and vancomycin, with the latter added after cultures revealed a concomitant infection with *Gemella morbillorum*.

After consulting with the orthopedic surgeons and infection disease team, it was decided at this stage to exclude the aneurysm and drain the abscess but leave the occluded iliac arteries and the vertebrae for a later treatment stage according to the clinical progression. Seven days after initiation of antibiotic treatment the patient was taken to the operating room for endovascular exclusion of the IRAAA. The second part of the left subclavian artery was exposed via a supra-clavicular approach, and an 8 mm Dacron graft was anastomosed as a side arm. A Conformable Gore TAG[®] thoracic



[A] Abdominal aortic aneurysm and psoas abscess



[B] Right psoas abscess involving the groin area



[C] Stent graft deployment

endoprosthesis (W.L. Gore & Associates, Inc., Flagstaff, AZ, USA) was inserted via the Dacron limb in the following fashion: a 21 x 100 x 21 device was deployed into the right common iliac artery bifurcation followed by a 26 x 100 x 26 device, which was inserted into the smaller one and deployed just below the left renal artery [Figure C]. Following the stent graft insertion, the psoas abscesses were drained through separate bilateral retroperitoneal incisions. The operative and postoperative courses were unremarkable. The pre-discharge CT-angiography [Figure D] demonstrated well-drained psoas abscesses and no endoleak. Due to the skeletal involvement, rifampin was added to the antibiotic treatment. The patient was discharged on a lifelong antibiotic therapy course.

COMMENT

Coxiella burnetii is the etiologic agent of Q fever, a zoonosis with a worldwide distribution, especially in rural areas. Symptoms of Q fever are polymorphic and non-specific; almost 60% of Q fever cases are asymptomatic. The delay between the exposure and the clinical presentation ranges from months to several years [1]. The disease may be subclinical, acute or chronic. Chronic Q fever is more frequent in city residents than in rural inhabitants. Endocarditis with negative blood culture results is the most common clinical presentation of chronic Q fever and is found in about 60–70% of the cases [2]. Other manifestations include osteoarticular infection, chronic hepatitis,



[D] Follow-up CTA, postoperative day 10

chronic pulmonary infections, and isolated fever. Chronic Q fever is diagnosed almost exclusively in patients with either a cardiovascular abnormality (valvulopathy, prosthesis, aneurysm) or an immunocompromised condition although the incidence of the disease is probably underestimated [3].

The association between aortic aneurysm and chronic *Coxiella burnetii* infection is extremely rare, with only a few case reports described in the literature. Even in the most recent series, all patients were treated only by open surgery after an appropriate antibiotic treatment regimen [4,5].

Our patient posed the double challenge of mycotic aneurysm on the one hand and iliac obstructive disease on the other. The decision was made to first tackle the aneurysm and not to treat the obstructive disease at the same time. In order to avoid any direct contact between the graft and the psoas abscess we elected to use an endovascular solution. The left subclavian artery was selected as the route of entry as both iliac arteries were occluded. The Gore TAG device was deployed from distal to proximal, with the larger device (26 x 100 x 26) deployed into the smaller one (21 x 100 x 21). The smaller device in turn was deployed distally at the right common iliac artery bifurcation to assure proper sealing

between the grafts. At the completion of the endovascular portion of the operation, the bilateral psoas abscesses were drained via a retroperitoneal approach to control the infection.

Two other issues were the intermittent claudication and the osteomyelitis involving the lumbar vertebra. We chose to treat the life-threatening conditions, i.e., the mycotic aneurysm and the psoas abscesses, and postpone treatment of the vertebra as well as the iliac occlusive disease despite the patient's back pain and limiting claudication. We thought the claudication posed only a moderate limitation to the patient's daily life in view of the fact that he was incarcerated. The classic surgical solution, using the distal deep femoral artery as the target for bilateral axillo-femoral bypass via a lateral approach, thereby avoiding entrance to the groins, exceeds the requirements of the patient's situation. The decision to treat the vertebral osteomyelitis conservatively was made by the orthopedic spinal team.

We believe that the use of endovascular techniques as either a bridging or sometimes as a definitive procedure should be considered for complicated aortic infections.

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