Management of infected abdominal aortic aneurysm associated with vertebral destruction due to chronic leak

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ABSTRACT

يصف هذه المقال حالة مريض مُصاب بأم الدم الأبهرية البطنية نتيجة التهاب العمود الفقري بالبكتيريا العنقودية مقابل التهابه ببكتيريا البروسيلا وصاحب ذلك تسرب مزمن للشريان المُصاب بالتوسع الوعائي (أم الدم). كان المريض يبلغ من العمر 75 عاماً عند حدوث الشكوى وقد أُصيب بالحمى المالطية قبل 4 سنوات، ومن ثم بعد سنة كشفت الأشعة المقطعية عن وجود أم الدم الأبهرية البطنية أسفل الشريان الكلوي والتي وصل حجمها إلى 4.5 سم. عاد المريض إلى المستشفى بعد إصابته بألم حاد ومتفاقم في أسفل البطن مع انتشاره إلى أسفل الظهر ومفصل الورك الأيمن صاحبه انخفاض في وزن المريض، وفقدان للشهية، وتوعك في الجسم. أوضحت الأشعة المقطعية ازدياد في حجم أم الدم الأبهرية البطنية أسفل الشريان الكلوي وبلوغه 6.5 سم مع تآكل في الفقرة القطنية الثالثة والرابعة، وتمدد في العضلة القطنية بسبب تسرب خلفي مزمن من أم الدم، فيما أشارت نتائج الفحص المخبري إلى أن معدل تثقل كريات الدم الحمراء كان 30، ومعدل بروتينات سي التفاعلية كان 89، وكانت نتيجة عيار البروسيلا سلبية. شُخص المريض على كونه يعاني من أم الدم الجرثومية، ومن ثم تم علاجه جراحياً وذلك بوضع شريان اصطناعي يصل الشريان الأبطي الأيسر بشرياني الفخذ الأيمن والأيسر مع ربط وإزالة الشريان الأبهر البطني من أسفل شرياني الكليتين وحتى الشريان الحرقفي الأيمن والأيسر.

We report a case of a patient with an infected abdominal aortic aneurysm due to *Staphylococcus* versus Brucellar spine infection complicated by aortic aneurysm with chronic contained leak. A 75-year-old patient who had a history of Brucellosis 4 years ago presented one year later with 4.5 cm infra renal abdominal aortic aneurysm (AAA). He presented with aggravated acute abdominal pain radiating to the back and right hip, loss of weight, anorexia, and malaise. The CT-scan showed an AAA of size 6.5 cm involving infra-renal abdominal aorta with erosion of the body of lumbar vertebrae L3 and L4, and stretching of psoas muscle by a chronic contained posterior leak. Investigations showed erythrocyte sedimentation rate of 30, C-reactive proteins of 89, and the Brucella titer was negative. The diagnosis was infected aneurysm and the patient underwent axillo bifemoral bypass and ligation of aorta below the renal arteries. Tissue culture postoperatively showed coagulase negative *Staphylococcus*.

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Vertebral erosion is unexpected in primary abdominal aortic aneurysms. However, it may be observed secondary to aortic aneurysm that develops due to inflammation, infection[1,2] and pathologies, such as Behcet's disease and syphilitic aortitis. There are a few case reports published on lumbar vertebral destruction caused by an aneurysm after aortic bifurcation graft surgery.[3-5] The purpose of this study is to report a patient who suffered from abdominal and back pain due to chronic leak of an infected aortic aneurysm.

Case Report. A 75-year-old patient who had a history of Brucellosis 4 years ago, presented one year later after treatment for Brucellosis with 4.5 cm infra renal abdominal aortic aneurysm (AAA) confirmed by CT-scan, with vertebral changes at levels L3 and 4, but no destruction (**Figure 1**). He presented again 2 years later with aggravated central acute abdominal pain radiating to the back and right hip with loss of weight, anorexia, and malaise. There was no history of fever. He denied having a history of hypertension, diabetes mellitus, or any infectious disease other than Brucellosis. His

Figure 1 - Abdominal aortic aneurysm (white arrow) of 4.5 cm in diameter with vertebral changes (black arrows).

Figure 2 - A CT angiography showing an abdominal aortic aneurysm of 8 cm in diameter and posterior-lateral leak with vertebral destruction.

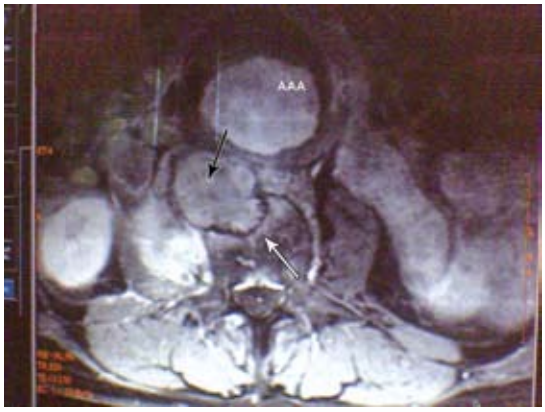

Figure 3 - An MRI showing the abdominal aortic aneurysm (AAA) with posterior contained leak (black arrow) and chronic vertebral destruction (white arrow).

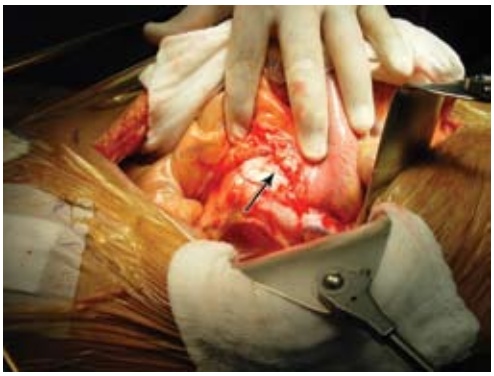

Figure 4 - Peroperatively showing the intestine adherent to the wall of the aneurysm (AAA).

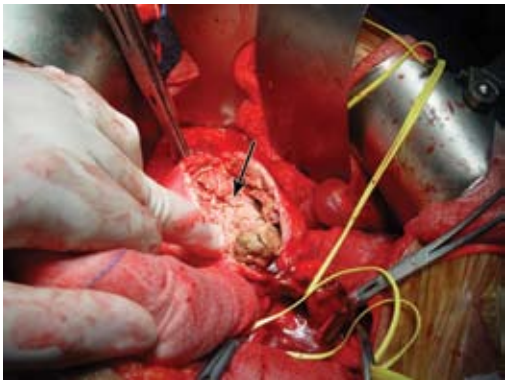

Figure 5 - Opening of the aneurysm (black arrow) showing a frothy material.

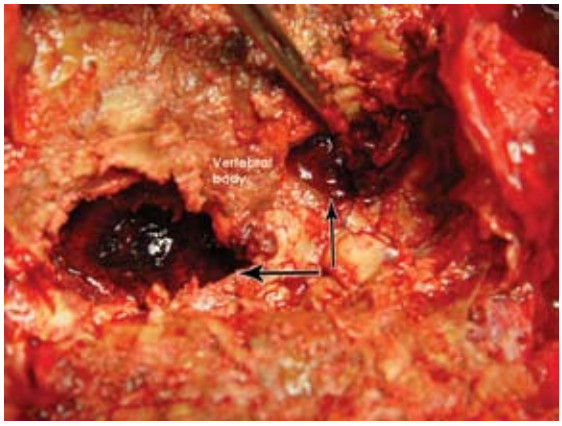

Figure 6 - Two necrotic lesions (arrows) at the vertebral body.

family history was unremarkable. He use to live at the northwest of Saudi Arabia in the Bedouin area, worked as a camel shepherd, and he gave a history of drinking camel milk. On examination, his blood pressure was 140/90 mm Hg. Abdominal examination revealed a soft lax abdomen with a mass of 7x5 cm in size at the center of the abdomen. It was pulsatile expansile, and mildly tender. He had good peripheral pulses. Other examinations were within normal limits. Laboratory investigations were as follows: hemoglobin - 11.5 g/dl, white blood cells - 10.5 x 10^9/L, platelet count 275x10^9/L, erythrocyte sedimentation rate (ESR) - 30 mm/hr, C-reactive proteins - 89 mg/l, urea and electrolytes - normal, and lipid profile normal coagulation profile - normal. The Brucella titer was negative. The CT angiography (**Figure 2**) and MRI (**Figure 3**) showed a huge AAA more than 8 cm in diameter with invasion to the lumbar vertebrae L3 and L4. The aneurysm started

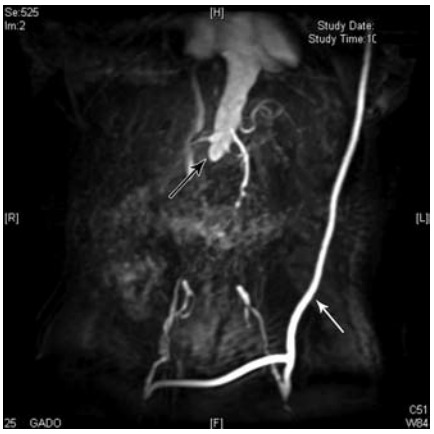

Figure 7 - An MRA of the patient one year postoperatively. Ligated aortic end (black arrow) and the axilo-bifemorla graft (white arrow).

Figure 8 - An MRA of the patient 3 years postoperatively. Axilo-bifemoral graft (white arrow).

from the infra-renal, and went up to the bifurcation of the common iliac artery. There was a posterior-lateral contained leak compressing psoas muscle on the right side. The patient had axillo bifemoral bypass and ligation of aorta below renal arteries proximally and both common iliac arteries distally with debridement by removing all aortic tissue (**Figures 4 & 5**), and all frothy material at the back of the aneurysm where it leaked and eroded into the vertebra (**Figure 6**). Tissue culture post-operatively isolates a coagulase negative *Staphylococcus*. The patient has remained symptom-free, and there has been no evidence of recurrence or complications for 3 years of follow up with MRA (**Figures 7 & 8**). He was maintained on Warfarin for one year, then shifted to anti-platelet.

Discussion. Abdominal aortic aneurysm is a common vascular disease of patients above 60 years old, and more in association with atherosclerotic disease. It is potentially a life-threatening condition. It has a wide spectrum of presentations and should be considered in the differential diagnosis for a number of symptoms. The AAA is usually the result of degeneration in the media of the arterial wall, resulting in a slow and continuous dilatation of the lumen of the vessel. In fewer than 5% of cases, AAA is caused by infection of hematogenous origin, either gram-negative organisms, or more commonly gram-positive organisms. Infected aneurysm are classified into 4 classes; the mycotic type belongs to the heart source, which start as infected endocarditis, and infected aneurysm formed as secondary to septic micro emboli from the heart, which migrate and implanted into the wall of the aorta through the vasavesorum which is not the case in our patient. The second type is the infection affecting an atherosclerotic (an important factor predisposing arteries to infection) diseased aorta and that lead to aneurismal changes. This type becomes more prevalent, and forms 14% of infected aortic aneurysm as in our patient. The third type is an infection that affects an already formed aneurysm, and the fourth type is a traumatic false aneurysm. In these cases, local invasion of the intima and media gives rise to abscess formation and aneurysmal dilatation of the vessel.

Vertebral destructions generally occur due to fracture, tumor, osteoporosis, spondylodiscitis, or spondylitis. In this case, a chronic leaked abdominal aortic aneurysm causing vertebral erosion and the presentation included the features of aortic aneurysm, as well as vertebral destruction. This is a very rare condition that is detected in patients admitted to the hospital with a complaint of abdominal pain, and generally diagnosed coincidentally during radiological examination. Previous published cases report vertebral erosion secondary to chronic aortic pseudoaneurysm that develops after graft operations.[3-7] In our case, the patient presented with vertebral erosions secondary to an infected AAA. These erosions developed as a result of an active infective process. Most reported infected aneurysms caused by the *Brucella spp* have been peripheral arterial aneurysms, which were secondary complications of infective endocarditis.[8-12]

In the surgical treatment of infected AAA, the choice of method for revascularization remains controversial. Extensive eradication of infected tissue, in situ graft interposition, omental wrapping, and extended antibiotic therapy may be successful treatments for infected aneurysms.[9,10] For this patient, our clinical

experience leads us to apply axillofemoral extra-anatomic bypass with ligation of the aorta below the renal arteries and excise the aneurismal wall, and debride all possible infected tissue.

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