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Case Report / Olgu Sunumu

Endovascular stent-grafting infection in active Behçet's disease concomitant with familial Mediterranean fever

Ailevi Akdeniz ateşinin eşlik ettiği aktif Behçet hastalığında endovasküler stent-greftleme enfeksiyonu

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A 29-year-old male patient with one year history of Behçet's disease was admitted to a nearby hospital with the complaints of abdominal and back pain. His medical history included familial Mediterranean fever (FMF) for 16 years. Thoracoabdominal computed tomography revealed a giant saccular aneurysmal dilatation of the abdominal aorta at the infrarenal level. He was referred to our institution. Endovascular stent-graft infection developed during follow-up after an endovascular stent-graft was placed. At fourth month of follow-up, the patient was urgently operated due to a rupture during endovascular drainage of a retroperitoneal abscess and an axillobifemoral bypass graft was implanted. This case demonstrates that endovascular stent-grafting should be a valid therapeutic alternative in the management of urgent treatment of abdominal aortic aneurysm in active Behçet's disease and AAA, as the surgical repair of active Behçet's disease aneurysm is a very highly risky. However, this case also highlights that endovascular stent-grafting may be highly risky for patients with active Behçet's disease, particularly who are on immunosuppressive drug regimen. Endovascular prosthesis infection following endovascular abdominal aneurysm repair is a dramatic event and its diagnosis and treatment are extremely complex and require a multidisciplinary approach.

Key words: Abdominal aortic aneurysm; Behçet's disease; familial Mediterranean fever; graft infection.

Yirmi dokuz yaşında bir yıldır Behçet hastalığı öyküsü olan erkek hasta karın ve sırt ağrısı yakınmasıyla bölgemizdeki bir hastaneye başvurdu. Tıbbi öyküsünde 16 yıldır ailevi Akdeniz ateşi (AAA) vardı. Torakoabdominal bilgisayarlı tomografide abdominal aortta, infrarenal düzeyde, dev bir sakküler anevrizma saptandı. Hasta merkezimize sevk edildi. Yerleştirilen endovasküler stent-greftten sonraki izleminde endovasküler stent-greft enfeksiyonuna rastlandı. Takibin dördüncü ayında retroperitoneal bölgede gelişen bir apsenin endovasküler yöntemle drenajı sırasında meydana gelen bir rüptür sonucu acilen ameliyata alınarak, aksillobifemoral baypas ile greft implantasyonu yapıldı. Bu olgu, aktif Behçet hastalığı ve AAA varlığında abdominal aort anevrizmasının acil tedavisinde endovasküler stent-greftlemenin, aktif Behçet hastalığına bağlı anevrizmanın cerrahi tedavisi çok riskli olduğundan, geçerli bir alternatif tedavi olduğunu ortaya koydu. Ancak bu olgu endovasküler stent-greftlemenin imünosüpresif ilaç tedavisi almakta olan aktif Behçet hastalarında yüksek risk taşıdığını da göstermiş oldu. Abdominal aort anevrizmasının endovasküler onarımı sonrası gelişen endovasküler protez enfeksiyonu dramatik bir olay olup tanı ve tedavisi ileri derecede karmaşık ve multidisipliner yaklaşım gerektirir.

Anahtar sözcükler: Abdominal aort anevrizması; Behçet hastalığı; ailesel Akdeniz ateşi; greft enfeksiyonu.

Behçet's disease (BD) is an inflammatory disorder characterized by recurrent oral and genital ulcers, uveitis, and skin lesions,[1] but vascular involvement is rare. In addition, according to several studies, the prevalence rate for arterial involvement in patients with BD is between 2.2 and 18%.[2] Nevertheless, the spectrum of vascular disease is broad and unique with BD, one of the few vasculitides that can involve large vessels like arteries and veins. In fact, aneurysms occur more frequently than occlusion in BD,[3] with the most striking vascular findings being multiple central and peripheral arterial aneurysms. Although vascular

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involvement appears in only 7-29% of BD patients, this is the most common cause of mortality with this disease.[3] Bacterial infection is often associated with these vascular conditions, and surgical repair for these patients is an extremely hazardous undertaking[4] because aneurysm formation is frequently complicated by fatal rupture, making surgical treatment necessary.[5] Endovascular methods, such as the insertion of a stent graft, have been recommended to avoid complications associated with this surgery since they are less invasive.[6] Endovascular prosthesis infection after abdominal aneurysm repair is a rare but dramatic event, and its diagnosis and treatment are extremely complex. Generally, clinical pathogenic organisms such as *Staphylococci* and *Escherichia coli* are the predominant causes of graft infection. In this case, we report an aortic aneurysm sac infection following endovascular aneurysm repair in a patient with an active form of BD along with familial Mediterranean fever (FMF).

CASE REPORT

A 29-year-old man with a one-year history of BD was admitted to a nearby hospital with complaints of abdominal and back pain. His medical history also included FMF that had been present for 16 years. The patient had undergone an appendectomy eight years earlier and had a history of deep vein thrombosis (DVT) that began six months prior to his admission. He was taking methylprednisolone 40 mg intravenous (once a day) (Prednol®, MN Pharmaceuticals, İstanbul, Turkey), colchicine 0.5 mg (four times a day) (Colchicum Dispert®, Dr. F. Frik İlaç, İstanbul, Turkey), and cyclophosphamide 1 gram once a month (Endoxan®, Eczacıbaşı-Baxter Hospital Supply Inc., İstanbul, Turkey).

Thoracoabdominal computed tomography (CT) revealed giant saccular aneurysmal dilatation of the abdominal aorta at the infrarenal level, with the diameter of the aneurysm measuring 8.5 cm at its widest. In addition, a laboratory analysis determined that the erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) levels were higher than normal (45 mm/h and 4.77 mg/dl, respectively).

The patient was then referred to our hospital with the diagnosis of an active form of BD and a leaking giant abdominal aortic aneurysm. The control ESR and CRP values continued to be high during his hospital stay despite optimal medical treatment. A control thoracoabdominal CT scan revealed that the aneurysm had increased in diameter and showed a leak. Surgery was not considered since the BD was still active. The Rheumatology department also ruled out any surgery due to the high levels of sedimentation and CRP. Therefore, endovascular treatment was planned instead. One gram of methylprednisolone (Prednol®, MN Pharmaceuticals, İstanbul, Turkey) was administered intravenously as part of the patient's pulse steroid treatment before the intervention, and one gram of the prophylactic antibiotic cefazolin (Eqizoline®, Tüm-Ekip İlaç, İstanbul, Turkey) was admistered three times a day. Afterwards, the sheaths were inserted into the bilateral femoral arteries under local anesthesia, and aortic and pelvic angiographies were performed (Figure 1). After adjusting the ostia of the renal arteries, a Gore® Excluder® AAA Endoprotheses stent graft (W.L. Gore & Associates, Flagstaff, Arizona, USA) measuring 23 mm in diameter was inserted. We chose an aorto-bi-iliac stent-graft since the aneurysm involved the beginning of both iliac arteries (Figure 2). Afterwards, control aortography revealed no endovascular leak (Figure 3). The patient was followed up in the intensive care unit (ICU) where steroid and colchicine treatments for maintenance were administered for a day. The patient was then transferred to the regular clinic where he stayed for two more days.

However, the patient was readmitted four months after the intervention because of a high fever and abdominal pain, and CT detected air and an abscess

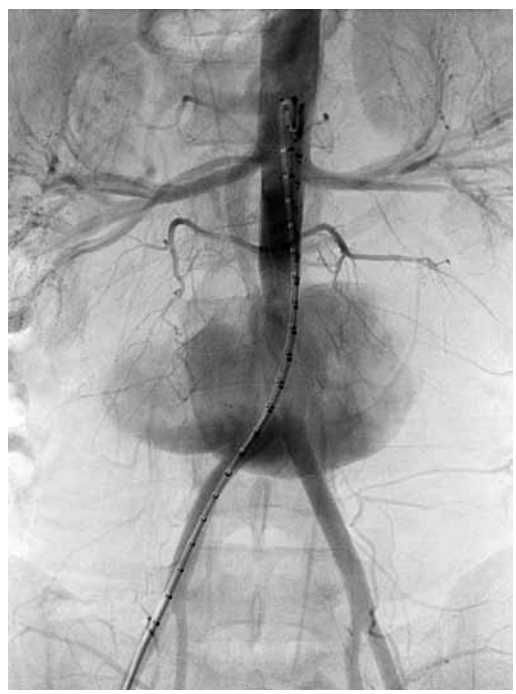

Figure 1. Angiographic image of the abdominal aortic aneurysm.

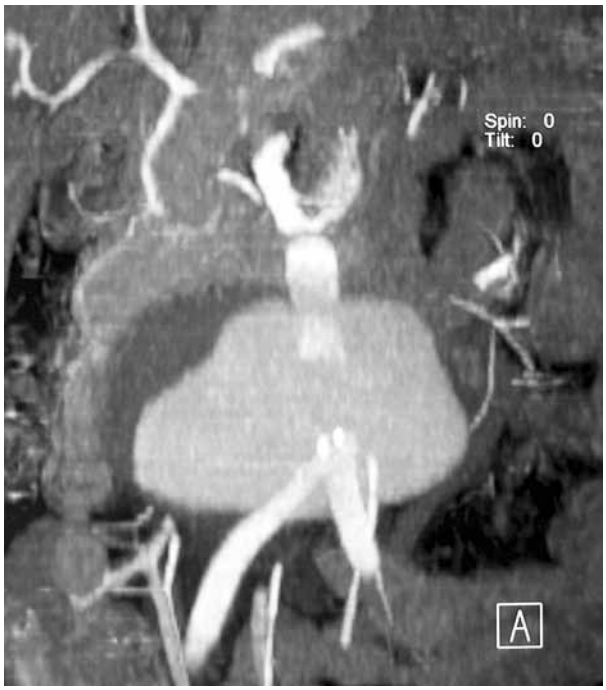

Figure 2. Computed tomography angiogram of the aneurysm showing the involvement of both iliac arteries.

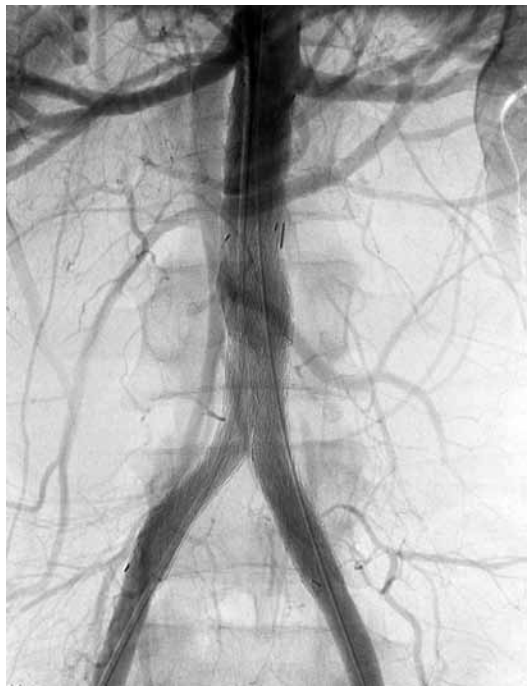

Figure 3. Angiographic image of the aneurysm after endovascular stent graft interposition.

cavity around the stent graft (Figure 4). A diagnosis of graft infection was made, and treatment with the case-sensitive antibiotic teicoplanin (Targocid®, Sanofi-Aventis Ltd., İstanbul, Turkey) was initiated (once a day) in combination with meropenem trihydrate (Meronem®, AstraZeneca, İstanbul, Turkey) (three times a day). The patient was discharged after control CT angiography demonstrated that the infection around the stent graft had regressed significantly, and this was verified by CT (Figure 5). However, CT angiography at the seven-month follow-up showed that the abscess around the graft had recurred at the level of the iliac bifurcation stent graft, and retroperitoneal abscess drainage was performed. Emergency axillofemoral and femorofemoral bypass graft surgery was then performed using a Flowline Bipore® expanded polytetrafluroethylene (ePTFE) vascular graft (JOTEC GmbH, Hechingen, Germany) because of a rupture

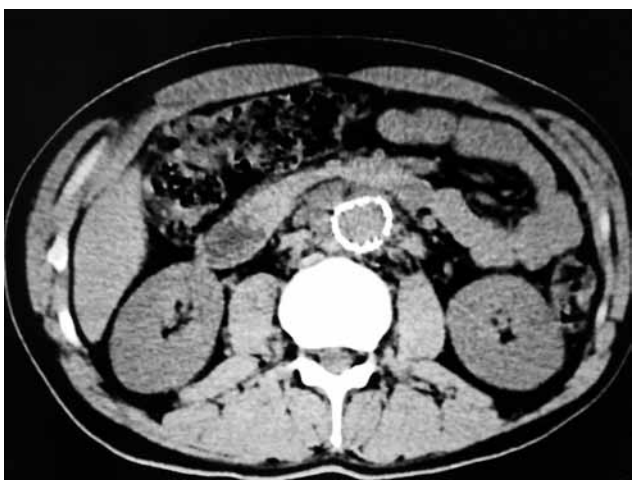

Figure 4. The air and abscess detected by computed tomography around the stent graft.

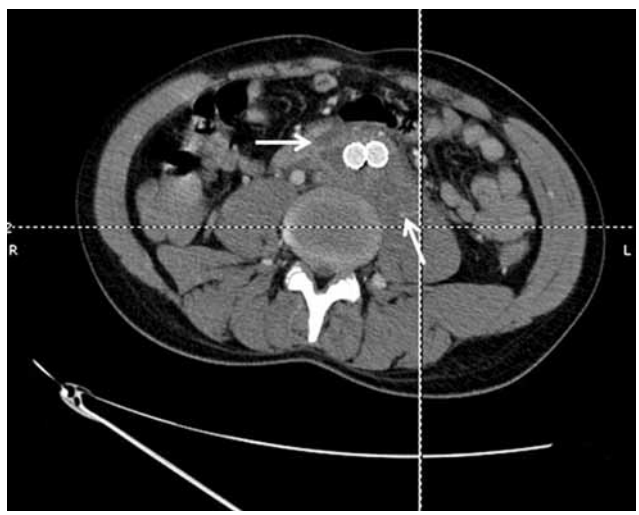

Figure 5. Regression of the air and abscess around the stent graft after medical treatment as detected by computed tomography and reported by interventional radiologists. The regression is evident when compared with Figure 4.

during the endovascular procedure. Unfortunately, *Escherichia coli* was detected in the liquid culture, and the patient died on the postoperative sixth day because of septic shock and deterioration in his general condition.

DISCUSSION

Behçet's disease is an inflammatory genetic disease of episodic nature in which vasculitis plays an important pathogenic role. Although tightly linked to the human leukocyte antigen (HLA)-B5, neither the genetic defect nor the mode of inheritance are currently known. Familial Mediterranean fever is a Mendelian autosomal recessive disease linked to a single mutated FMF gene (MEFV) with an unknown function. Both diseases show unique geographic and ethnic prevalence,[7] and both feature chronic, relapsing inflammatory disorders caused by abnormal neutrophil activation.[7,8] Recently, the findings of Livneh et al.[9] suggested that at least for some patients suffering from the combination of FMF and BD and the FMF is expressed in spite of the presence of only one coding MEFV mutation and an uninvolved non-carrier chromosome. Furthermore, their finding was highly associated with a simultaneous occurrence of BD. The presence of the MEFV gene was identified on chromosome 16p.13.3 in 1997. In our study, BD and FMF were found coincidentally in the same patient. He was scanned on account of the FMF mutation, and M 680I(G/C) and V726A were found, indicating combined heterozygosity. As Touitou et al.[10] stated, some MEFV mutations are more frequent in BD patients than in controls. In addition, Atagündüz et al.[11] reported that MEFV mutations originally linked to FMF may act as a genetic susceptibility factor for other inflammatory disorders such as vascular BD. A higher concentration of FMF gene mutations also occurs with BD, and as in our case, this is associated with vascular involvement.

The active stage in BD is an extremely susceptible phase because major surgery during this period has an unacceptably high morbidity. Hence, endovascular stent grafts are a reasonable alternative in high-risk surgical patients such as ours.[12] Successful results have been reported in the literature regarding the use of endovascular stent grafts since the early 1990s,[4,13] with graft-related septic complications following this procedure being rare. However, when they occur, these complications are associated with significant mortality.[14]

The clinical presentation of endovascular graft infection can be nonspecific. First of all, diagnostic imaging is important for the detection of this complication in order to analyze the extent of the infection and differentiate it from other infectious diseases, with CT being the gold standard. The presence of persistent perigraft air, fluid, or soft-tissue attenuation along with pseudoaneurysm formation or osteomyelitis can be suggestive of graft infection.[15] The consensus is that infected graft material should always be removed via extra-anatomic bypass and the use of long-term parenteral antibiotics.[16] In fact, this is exactly what we performed when we chose the axillofemoral and femorofemoral bypass. Potential complications of this surgery include aortic stump blowout, limb thrombosis, the need for amputation, recurrent infection, and death.[17,18] In our patient, the graft was removed, and axillobifemoral bypass graft surgery was performed. However, the patient died on the postoperative sixth day because of deterioration in his general condition and septic shock. In the literature, potential risk factors for endograft infection include adjunctive endovascular procedures during the primary implantation, immunesuppression, the treatment of pseudoaneurysms, and infected central venous catheters.[19] Veger et al.[20] discovered that prophylactic administration may decrease the likelihood of bacteremia before stent graft insertion. Additionally, the authors also postulated that poor intraluminal healing of stent grafts, as observed in several explant studies, may result in higher susceptibility to episodes of bacteremia than for patients for whom prosthetic vascular grafts were inserted during open repair. In our patient, systemic immunosuppressive medication, including steroids, colchicines, and cyclophosphamide, was given to the patient postoperatively.

In conclusion, for BD patients still on immunosuppressive therapy, endovascular stent grafting may be very risky. Abscesses that cause sepsis and death early in the diagnosis may appear; therefore, effective therapeutic intervention is especially critical for patients with active BD.

Declaration of conflicting interests

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