

Recanalization of total aortoiliac occlusion via contralateral aortofemoral bypass graft

Tam aorta ve iliak arter tıkanmasının konralateral aortafemoral baypas greft yolu ile açılması

Mahmut Tuna Katırcıbaşı, M.D., Uğur Özkan, M.D.#

Department of Cardiology, Private Ortadoğu Hospital, Adana, Turkey

#Department of Radiology, Private Ortadoğu Hospital, Adana, Turkey

Summary– Severe aortoiliac disease is traditionally treated with aortofemoral bypass (AFB). However, certain recurrent problems typically follow this type of treatment, problems which often require surgical intervention. Presently described is the endovascular recanalization of the native aortoiliac arteries in 2 patients who had undergone AFB. One patient with a history of aortounifemoral bypass graft had a newly emerged distal abdominal aorta and contralateral iliac artery occlusion as a result of progressive atherosclerosis. Another patient had thrombosis of the left limb of aortobifemoral bypass graft. In these patients, primary stenting was used as secondary treatment to recanalize aortoiliac occlusion. To our knowledge, the present are the first reported cases of such treatment.

In current vascular practice, extensive aortoiliac occlusive disease is traditionally treated

with open revascularization with aortofemoral bypass (AFB). However, rates of treatment with AFB have declined, and the development of new technologies and techniques has led to increased use of endovascular treatment.^[1,2] In experienced centers, indications for endovascular treatment of aortoiliac occlusive disease have extended to complex lesions classified as C and D by the TransAtlantic Inter-Society Consensus (TASC), even when complex treatment of the distal aorta or aortic bifurcation had been indicated in recent years.^[2,3]

In spite of the highly satisfactory results of AFB, recurrent problems may arise during the postopera-

Özet– Ciddi aortoiliyak hastalıklar geleneksel olarak aortofemoral baypas (AFB) greft ile tedavi edilir. Bununla birlikte cerrahi sonrası tekrarlayan problemler gelişebilir ve bu problemler de sıklıkla tekrar cerrahi tedavi gerektirir. Bu yazıda, daha önce AFB ameliyatı geçirmiş olan iki hastada aorta ve iliak arter tıkanmalarının endovasküler yolla tedavisi sunuldu. Birinci olgu; daha önce tek taraflı AFB greft ameliyatı geçiren ve aterosklerozun ilerlemesi sonucu distal abdominal aorta ve karşı taraf iliak arterinde tıkanma gelişen hastaydı. Diğer olgu ise greftin sol bacağına tromboz gelişen, iki taraflı AFB grefti olan hastaydı. Bu hastalarda ikincil tedavi olarak endovasküler primer stent yerleştirilmesi işlemi kullanılarak aortoiliyak tıkanmalar rekanalize edildi. Bu sunum, bizim bilgilerimize göre bu şekilde tedavi edilen olguların ilk bildirimidir.

tive period due to anastomotic neointimal hyperplasia and/or progressive atherosclerosis. When secondary vascular problems occur, commonly implemented surgical treatment options include graft thrombectomy and profundoplasty, or cross-femoral graft to the distal patent deep femoral artery.^[4] Presently described is the use of a primary stenting technique for the recanalization of chronic aortoiliac occlusion in patients with AFB graft, as a novel alternative to surgical treatment.

CASE REPORT

Case 1– A 67-year-old man who underwent aortounifemoral bypass graft for right iliac artery occlusion 8 years prior was admitted due to intermittent claudication that had begun 10 months prior. The femoral, popliteal, dorsalis pedis, and tibialis posterior pulses

Abbreviations:	
AFB	Aortofemoral bypass
MRA	Magnetic resonance angiography
TASC	TransAtlantic Inter-Society Consensus

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Correspondence: Dr. Mahmut Tuna Katırcıbaşı. Ziyapaşa Mahallesi, Eski Baraj Mevki, No: 1, Seyhan, 01140 Adana, Turkey.

Tel: +90 322 - 454 44 30 e-mail: doktortuna@gmail.com

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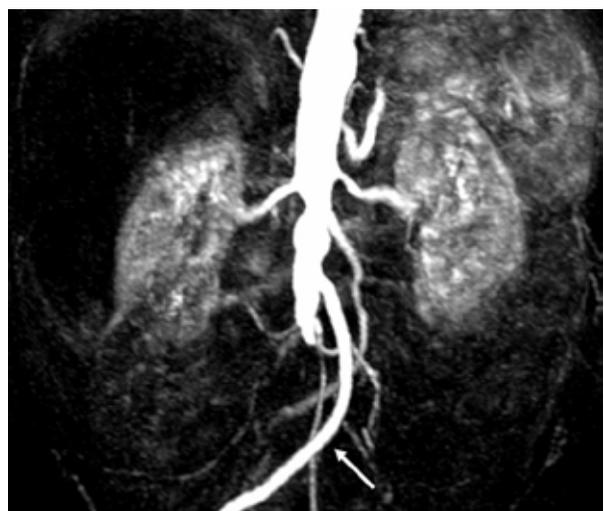


Figure 1. Magnetic resonance angiography revealed patent aortounifemoral (right) bypass graft (white arrow), but complete occlusion of the distal abdominal aorta and iliac arteries.

were not palpable on the left leg during physical examination. The patient had multiple cardiovascular risk factors, including hypercholesterolemia, coronary artery disease, and a history of heavy smoking (60 pack-years). Magnetic resonance angiography (MRA) revealed patent aortounifemoral (right) bypass graft, but due to progressive atherosclerosis, complete occlusion of the distal abdominal aorta and iliac arteries was observed (Figure 1). The patient declined open surgery due to the high operative risk and opted for endovascular treatment.

Case 2— A 63-year-old man with a history of AFB for total aortoiliac artery occlusions presented with sudden-onset pain, severe intermittent claudication, absent pulses, paresthesia, and pallor of the left leg that had begun 2 months prior. The patient had multiple atherosclerotic risk factors, including hypertension, hypercholesterolemia, coronary artery disease, and a history of heavy smoking (40 pack-years). The femoral, popliteal, dorsalis pedis, and posterior tibialis pulses were not palpable on the left leg upon physical examination. MRA showed complete occlusion of the distal abdominal aorta and the bilateral common iliac arteries, with reconstitution at the level of the iliac bifurcations. MRA also revealed that the body and right limb of the AFB were patent, but that the left limb was occluded. The patient refused to undergo another surgery for recanalization of the occluded graft limb, and was referred to the present center for possible endovascular treatment.

Endovascular treatment

Written informed consent was obtained after detailed explanation of risks and benefits. The procedure was performed in the angiography unit under local anesthesia, intravenous sedation, and analgesia with 2 mg dormicum and 100 µg fentanyl citrate. Ultrasound was used to facilitate the access of the ipsilateral retrograde femoral artery and the contralateral graft. After 6-F vascular sheaths were inserted into the left femoral artery and the right aortofemoral graft limb, heparin was administered at a dose of 5000 IU. Aortogram revealed

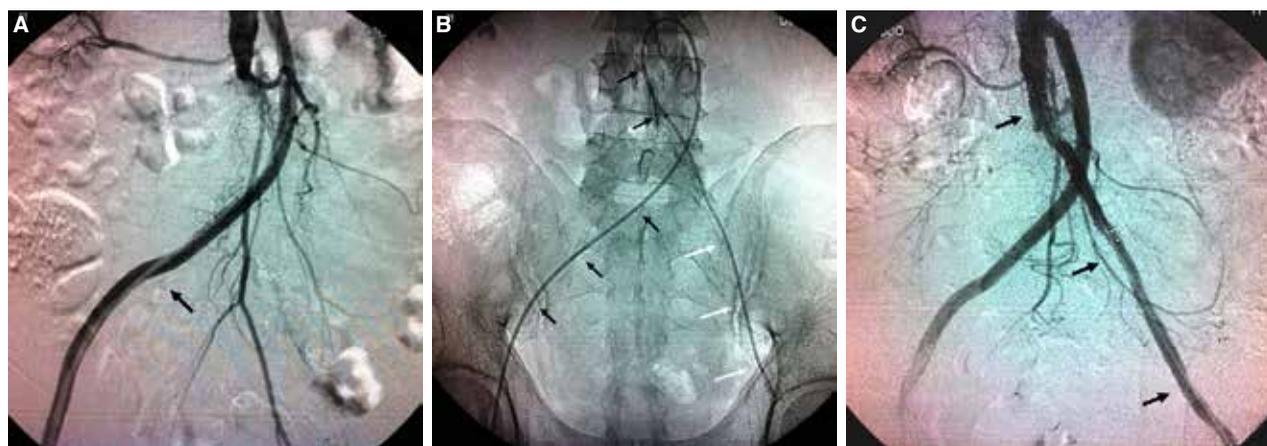
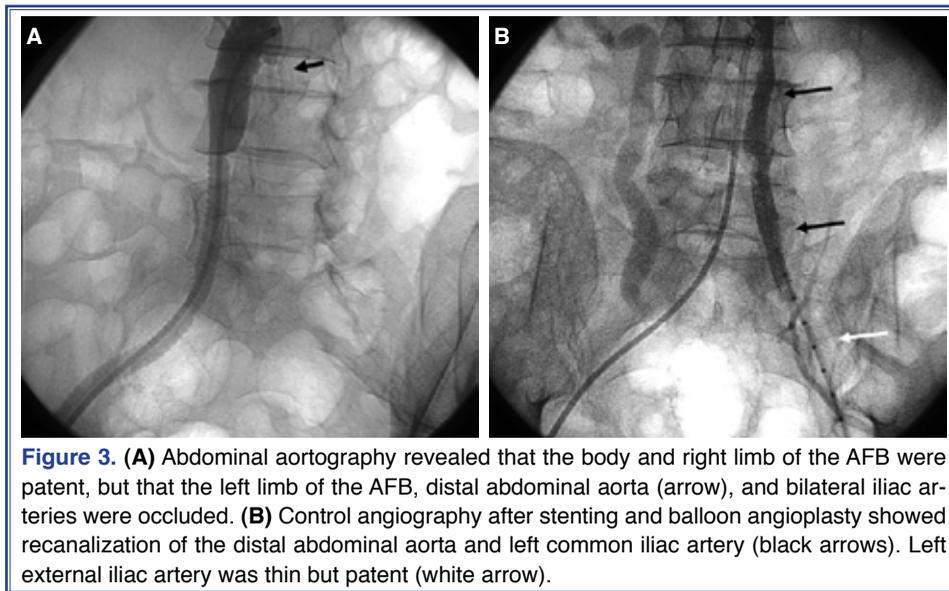


Figure 2. (A) Abdominal aortography revealed patent aortounifemoral (right) bypass graft (black arrow), but complete occlusion of the distal abdominal aorta and iliac arteries. (B) Successful crossing of the distal abdominal aorta and left iliac artery occlusions was achieved by use of a long guiding sheath (black arrows) and a 4-F vertebral catheter (white arrows). (C) After stenting and balloon angioplasty, angiography revealed recanalization of the distal abdominal aorta and both iliac arteries on the left.



complete occlusion of the distal abdominal aorta, as well as the bilateral iliac arteries, in both patients.

First attempt at recanalization from the ipsilateral femoral artery in a retrograde fashion was unsuccessful in both patients, due to failure to re-enter the true aortic lumen. Therefore, the patent limb of the AFB was used to access the distal abdominal aorta. The short vascular sheath in the graft was exchanged with a long, angled-tip, 6-F, ANL 2 guiding sheath (Cook Group, Inc., Bloomington, IN, USA). The guiding sheath was placed just above the distal abdominal aorta occlusion, and antegrade recanalization was attempted using the wire loop technique.^[3] The distal abdominal aorta and left iliac occlusions were successfully crossed using a 0.035-inch hydrophilic guidewire and a 4- or 5-F vertebral catheter (Terumo Corp., Tokyo, Japan). After crossing through the aortoiliac occlusion from the aortic side, the tip of the guidewire (in crossover position) was snared and retrieved from the left femoral sheath. It was then exchanged for an Amplatz wire (St. Jude Medical, Inc., Little Canada, MN, USA). Primary stenting of the distal abdominal aorta and iliac arteries were performed from the ipsilateral femoral artery. In the first patient, 9x60-mm and 8x100-mm self-expandable bare stents (Terumo Corp., Tokyo, Japan) were deployed in the distal abdominal aorta, and left common and external iliac arteries. Balloon angioplasty was performed with 7–8x40-mm balloon catheters (Figure 2). In the second patient, 9x60-mm and 8x40-mm self-expandable bare stents (Terumo Corp., Tokyo,

Japan) were deployed in the distal abdominal aorta and in the left common iliac artery, and the patient was further balloon-dilated to 8 mm using an 8x40-mm balloon catheter (Figure 3).

Final angiographies demonstrated that flow had been re-established through the reconstructed distal abdominal aorta and left iliac arteries, without significant residual stenosis. The procedure was successfully performed in both cases with excellent angiographic results. No minor or major complications were observed, and the patients were discharged on the day following the procedure with clopidogrel (75 mg once a day for 1 month) and aspirin (100 mg once a day for life). Follow-ups were attended at 1 and 6 months. Intermittent claudication resolved completely, and femoral pulses were palpable. Color Doppler ultrasonography revealed the patency of the distal abdominal aorta and the left iliac stents at follow-up examinations.

DISCUSSION

The treatment of extensive aortoiliac disease with surgical revascularization is recommended in TASC guidelines. Surgery provides good long-term patency, but recurrent problems may arise due to anastomotic neointimal hyperplasia and/or progressive atherosclerosis in the native arteries. The most common late complication of AFB graft is graft limb thrombosis, usually caused by outflow obstruction due to anastomotic neointimal hyperplasia or progressive athero-

sclerosis in the femoral arteries. When graft limb occlusion occurs, severe ischemia usually necessitates urgent revascularization in order to save the leg. Graft thrombectomy and profundaplasty, or cross-femoral graft to the distal patent deep femoral artery are standard treatment options used to re-establish graft patency with low morbidity and mortality.^[4,5] However, if the bypass graft fails, the ensuing repeated surgeries have less favorable short- and long-term outcomes. Consequently, these patients are often denied surgery and left untreated for long periods. In recent years, endovascular techniques such as manual aspiration thrombectomy or thrombolysis with balloon angioplasty and/or stenting have been used as novel alternatives to surgical thrombectomy. These techniques are reportedly effective methods of recanalization in cases of graft thrombosis.^[5]

Controversy persists regarding the role of endovascular techniques in the management of extensive aortoiliac disease (TASC C and D lesions). However, the implementation of new devices and techniques has expanded the role of endovascular treatment for more extensive aortoiliac lesions. Recently, aggressive interventionalists have treated extensive aortoiliac lesions by means of endovascular reconstruction with thrombolysis, angioplasty, and/or stenting, even when complex treatment of the distal aorta or aortic bifurcation is indicated.^[3,6] The present results demonstrate that endovascular recanalization of the native aortoiliac arteries is a good alternative to surgical intervention in patients with secondary vascular problems in the aortoiliac arteries or AFB graft. Although long-term patency of endovascular treatment is still inferior to that of the AFB graft, endovascular treatment is acceptable, given the reduced risk of perioperative complications, similar rates of amputation, and comparable 30-day mortality.^[1,7]

Single iliac occlusion is often successfully treated with antegrade (crossover) or retrograde femoral approach.^[8] However, in the event of total aortoiliac occlusion, femoral access is usually unsuccessful, as the level of reentry into the aorta can be unpredictable from a femoral retrograde approach. As there is often risk of extending the subintimal dissection into a patent aortic segment, many interventionalists prefer the brachial approach.^[6] However, in lieu of the brachial approach, the patent AFB graft limb was chosen as access in the present cases. A long guiding sheath

was used to provide support for the wire and catheter during recanalization, and this crossover approach via AFB graft was successful in both patients.

Endovascular recanalization of native aortoiliac arteries may be a good alternative to surgical or endovascular thrombectomy of graft thrombosis in patients with AFB graft. As an alternative to the femoral or brachial approach, patent contralateral AFB can be used as an access for the recanalization of aortoiliac occlusion. The present results and those of other small case series demonstrate that complex aortoiliac lesions and secondary vascular problems can be treated by endovascular means in patients with AFB graft. Based on these results, we believe that endovascular techniques will be the first choice of treatment for all types of aortoiliac lesions in the near future.

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Anahtar sözcükler: Aortailiyak hastalıkları; aortafemoral greft; endovasküler tedavi; stent.