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Hybrid repair of early aortobifemoral graft occlusion in a patient with antiphospholipid syndrome: A case report

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Abstract

Complete thrombosis of an aortic segment and unilateral graft limb after aortobifemoral bypass is a rare but severe complication. We report the case of a 41-year-old female patient who presented 2.5 months after aortobifemoral bypass for Leriche syndrome with recurrent claudication and ischemic rest pain. Imaging revealed complete thrombosis of the proximal aortic segment and the right iliac graft limb. A hybrid repair was performed consisting of bilateral groin incisions, thrombectomy, endarterectomy, and placement of kissing covered stents. Postoperative recovery was uneventful, with restored perfusion and good graft patency on follow-up. Thrombophilia screening demonstrated antiphospholipid syndrome, which was considered an important contributor to the early graft failure. This case illustrates that hybrid repair can be a safe and effective option for early aortobifemoral graft occlusion and highlights the importance of systemic evaluation for prothrombotic disorders in young patients presenting with unexplained thrombosis.

Keywords: aortobifemoral bypass, graft thrombosis, hybrid procedure, antiphospholipid syndrome

Introduction

Aortobifemoral bypass graft (AoFG) surgery is commonly used for the treatment of Leriche syndrome [1]. The TransAtlantic Inter-Society Consensus, based on the morphological classification of lesions, helps to determine whether an endovascular or open procedure is advised [2]. Graft limb thrombosis after AoFG is relatively rare.

When graft occlusion occurs, thrombectomy of the graft limb is indicated. When thrombectomy is not successful, an abdominal graft replacement must be weighed versus the current patency rates of the extra anatomic grafting [3-5]. When performing an open AoFG replacement, significant blood loss, iatrogenic trauma, and a technically difficult procedure can be expected.

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Case presentation

A 41-year-old female patient presented to the emergency department with recurrence of intermittent claudication pain for several weeks, acute onset of a colder foot on the right side, and nightly ischemic rest pain. The patient had previously undergone percutaneous transluminal angioplasty (PTA) with stenting of the common iliac artery (CIA), external iliac artery (EIA), and distal EIA on the right side. Sixteen months later, she presented with a Leriche syndrome type D, following TransAtlantic classification (TASC) II, for which an aortobifemoral silver dacron graft was placed and bilateral groin incisions for anastomosis on the common femoral artery (CFA) were made. Cardiovascular risk factors included smoking (20 pack years) with complete cessation after her first operation, hypercholesterolemia, and a strong family history of arterial disease at a young age. Post-operatively, an anti-platelet aggregation inhibitor and anti-hypercholesterolemia drugs were started. The latter was stopped on the patient's own behalf due to general discomfort.

Computed tomography (CT) peripheral angiogram revealed a total occlusion of the AoFG stenting at 1.5 centimeters (cm) of the proximal anastomosis (Figure 1). On the right-side, the entire length of the CFA was occluded (Figure 2). On the left side, we can see an occlusion of the limb of the graft with an open native circulation (Figure 2). The patient was scheduled for a hybrid operation with bilateral thrombectomy through an open bilateral groin incision and endarterectomy at the femoral bifurcation on the right side. Fogarty® graft thrombectomy catheters were introduced, opened, and retracted multiple times. Angiography showed a floating thrombus in the main body, which could not be recuperated, even by simultaneous thrombectomy of both limbs. The decision was made to employ kissing Covera covered stents (8x40 right and 8x80 left). Profundaplasty at the right CFA and the proximal superficial femoral artery (SFA) was performed. The left arteriotomy was primarily closed. Perioperatively, two units of O negative red blood cells were administered. Post-operatively, posterior tibial arteria pulsation was palpated bilaterally and dual antiplatelet therapy was started. The post-operative hospitalization duration was three days and uncomplicated. Control after six weeks showed no residual claudication complaints and good patency of the AoFG. Thrombophilia screening was performed at the follow-up consultation and was positive for antiphospholipid syndrome (APS). Biochemical testing was positive for all three antiphospholipid (anticardiolipin antibodies, lupus anticoagulant and anti-β2 glycoprotein 1 antibodies).

Figure 1: CTA 3 months post-AoFG showing inflow in the native aorta and AoFG, occlusion of both graft limbs, and complete occlusion of the right CFA with preserved native left-sided perfusion**.**

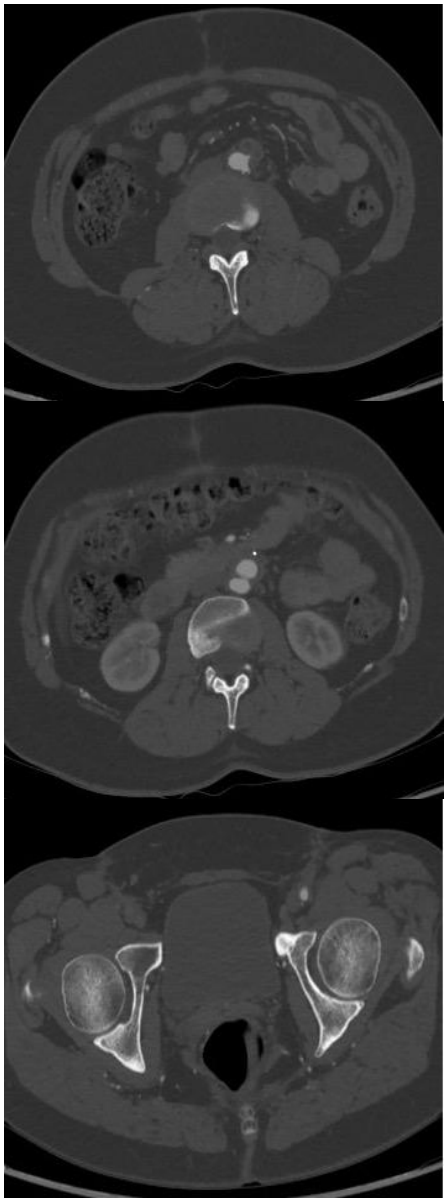

Figure 2: CTA 3 months post-AoFG showing occlusion of the right CIA, EIA and CFA; the AoFG is occluded 1.5 cm distal to the proximal anastomosis with retrograde filling of the left limb.

Discussion

In the treatment of Leriche syndrome an open aortofemoral bypass graft (AoFG) surgical procedure is commonly executed [1,5]. Other surgical treatment options are thromboendarterectomy (TEA) or percutaneous transluminal angioplasty (PTA) with or without stenting. The long-term patency rates observed with AoFG are 85-90% after five years and 75-80% after ten years [5,6]. The TransAtlantic Inter-Society Consensus lesions help to determine whether an open or endovascular procedure is indicated [7]. Types A and B are preferably managed endovascularly. Types C (low risk patients) and D lesions are managed by bypass graft. In the present case, AoFG surgery was performed due to type D lesions. In some instances, a type C or D lesion can be treated endovascularly.

Graft limb thrombosis after AoFG has an incidence of 14.5-30%. Higher rates are seen among females, younger patients, and those who continue to smoke and with extra-anatomical bypasses [3].

Leriche syndrome, especially when accompanied with continued smoking, is associated with a difference in patency [8].

The median time between AoFG and presentation with thrombotic episode is 2.6 years [3]. Most studies define early occlusion as occurring in the first 30 days post-operatively. Early occlusion is primarily due to a technical defect or inadequate flushing of the fresh thrombus from the graft before flow restoration [3,6]. When late occlusion (after 30 days) occurs, the most common reason for thrombosis is outflow stenosis due to vascular disease or secondarily, due to neointima hyperplasia [9]. In case of an occlusion, graft thrombectomy by groin cutdown has a success rate of 82-97% [3,6,10,11]. Whenever the graft limb thrombectomy is not successful or when bilateral occlusion occurs, an abdominal graft replacement has to be weighed versus the expected patency rates of the extra anatomical grafting. High morbidity and mortality is reported when performing an extra anatomical grafting [3,4,6,12]. Catheter-directed thrombolysis does not prevent an open operation in most cases and is expensive when both are needed [12].

When performing thrombectomy, large amounts of residual thrombus have been seen. Usage of a thrombectomy instrument may, in theory, disrupt the prosthetic graft wall. Caution and gentle handling are required when performing the scraping maneuver [6]. Once the thrombectomy has been performed, the outflow stenosis has to be treated; typically, the SFA and sometimes in severe stenosis the CFA are occluded. As shown by Fisch et al., a combined retrograde thrombectomy with treatment of native runoff artery anomalies can restore long-term patency after thrombosis with low mortality and morbidity [11].

Due to the fact that the open AoFG placement was only 2.5 months prior, a redo AoFG or placement of an extra anatomical bypass would be associated with high morbidity rates, significant blood loss, possible iatrogenic trauma, and a technically difficult procedure. Therefore, we planned a hybrid operation with an open femoral artery reconstruction and thrombectomy. In this case thrombectomy alone was not fully successful, with residual floating thrombus in the main body on angiography. We decided to perform an endovascular kissing stent graft placement.

Use of a kissing stent has been shown to be associated with higher risks of restenosis and reocclusion at the aortoiliac bifurcation, due to a bad apposition between the kissing stent and the arterial wall/graft, responsible for incorrect re-reendothelialization, neointimal hyperplasia, and eventually early thrombosis [13,14]. Studies have reported a five-year primary rate and assisted primary patency rate of 63-92% and 81-100% [15].

In this case the endovascular kissing stent graft technique was preferred over an open redo AoFG or placement of extra anatomical bypass because of the recent primary laparotomy and the high risk of open redo surgery. Due to the reconstruction of the distal arterial outflow with the help of a profundaplasty, a higher patency rate can be expected by solving the problem of late occlusion after 30 days.

The hematology department at our institute informed us that, due to the elevated levels of all three antiphospholipid antibodies, a positive result after 12 weeks can be expected. In cases of antiphospholipid syndrome, biochemical testing should be repeated after 12 weeks. Co-occurrence Leriche syndrome and APS, as suspected in the present case, is rare, may present with varying atypical symptoms, and can be very dangerous. Early revascularization is the recommended therapy when Leriche syndrome and APS co-occur post-operatively; secondarily, thromboprophylaxis is recommended [16]. Screening for prothrombotic conditions such as antiphospholipid syndrome should be considered in young patients with unexplained thrombosis.

Conclusion

A hybrid operation, thrombectomy, kissing stent graft combined with open groin incisions, and profundaplasty, can provide good short-term results in patients with aortoiliac unilateral limb occlusion after aortobifemoral graft placement. Studies to determine the short- and long-term effects and indications of the kissing stent technique in aortobifemoral grafting should be conducted in the future. Screening for prothrombotic conditions such as antiphospholipid syndrome should be considered in young patients with unexplained thrombosis.

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