

AXILLO-BIPOPLITEAL BYPASS APPLICATION IN CRITICAL LEG ISCHEMIA

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We performed an extended extra-anatomic bypass to salvage the both lower extremities in a diabetic and obese woman who had critical ischemia in her both lower extremities. Patient also had several abdominal operations. The patient did not have a good arterial vasculature as inflow or outflow conduit in the right femoral region and she also had femoro-popliteal bypass which was occluded on the left lower limb. Firstly, tromboectomy was performed to the occluded graft. Secondly, left axillofemoral, thirdly, left to right cross-over, finally, femoro-popliteal bypasses were performed to make an axillo-bipopliteal bypass functionally. The case will be evaluated under the literature knowledge.

Key words: Extra-anatomic, femoropopliteal bypass.

INTRODUCTION

Arterial reconstruction with extra-anatomic bypass surgery (Ex-AB) is performed for complex vascular pathologies which can not be managed with classical conventional methods. The Ex-AB concept was firstly suggested by Freeman and Leeds (1) in 1949 and three years later the first femoro-femoral bypass was performed. Blaisdell FW and Hall AD (2) were the first who performed a unilateral axillo-femoral bypass (Ax-FB) by using prothesis of Dacron graft, but Sauvage LR and Woods SJ (3) were the first who introduced a less traumatic surgery by performing axillo-bifemoral bypass (Ax-bFB). Salvaging of more than one extremity with a synthetic graft was performed by Smith (4) in 1977 and Veith (4) in 1978. Although this extended extra-anatomic bypass (Ex-EAB) technique was not performed widely. The axillo-popliteal, crossover axillo-popliteal, cross-over femoro-popliteal bypasses have been being performed in many centers with good patency and salvage rates (5,6). It is wisely known that the thrombotic threshold of PTFE grafts in smaller arteries is much more than in larger arteries. This is why PTFE grafts have higher patency rates. We suppose that the development in the PTFE graft technology and more widely usage of spiral grafts will increase the patency of axillo-popliteal bypasses (Ax-PB). In this report we wanted to present a case for whom cross-over axillo-popliteal bypass was performed.

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CASE REPORT

A 65 years old female patient, who had a complain of ischemic pain on both feet but worse on the right one, as hospitalised for further evaluation. There was no signal of Doppler ultrasound on the right foot. Wrist/arm ratio was <20%. There was chronical perfusion defect in both feet. In the history she had sectio caesarea three times and had an operation of open endarterectomy between distal aorta and right external iliac artery and underwent a left femoro-popliteal bypass surgery. The patient had a morbid obesity and uncontrolled diabetes mellitus. Her body mass index was 42.1, her height was 151 cm and her weight was 96 kg. Both coronary and peripheral arterial angiography were performed with Sones' method. Coronary angiography revealed total stenosis of RCA, and multiple critical stenosis in both LAD and CX arteries. So it was decided that the patient would get no benefit from CABG. Peripheral arterial angiography revealed total stenosis in the right iliac artery; no visualization in the right common femoral, right superficial femoral and right profunda femoral arteries, and well visualization in the proximal segment of right popliteal artery. On the left side peripheral arterial angiography revealed severe atherosclerosis seriously reduced flow in the iliac artery and total stenosis of ex-femoro-popliteal graft; but popliteal artery was being visualised distally.

The patient had a terrible resting pain and laparotomy was thought to have a high mortality risk because of the adhesions related with ex-operations, morbid obesity and the presence of coronary artery disease. It was decided to perform an axillo-bi-popliteal bypass surgery. It seemed that left axillary artery was proper enough as inflow artery. A left 5cm subclavicular incision was performed and axillary artery was explored. Another incision was performed to left inguinal region and ex-PTFE graft was explored. The proximal segment of right popliteal artery over the knee was also explored after a proper incision. Firstly an embolectomy was performed via ex-PTFE graft. Massive thrombotic material was removed. After thrombectomy the 6F Fogarty

catheter was sent till 60cm. Later on it was decided to perform a distal anastomosis (out-flow) onto the left femoropopliteal graft. The proximal side of 7mm spiral PTFE graft was anastomosed to the inferior part of axillary artery with 6/0 propylene suture with end-to-side technique. The inferior wall of axillary artery was preferred to prevent folding on the anastomotic region when the arms lifted up. After completing the anastomosis the graft carried to the left inguinal region via a single small incision. The graft was anastomosed to the prosthesis graft at the lower extremity with end-to-side technique. Arteriotomy was performed to the right popliteal artery. Fogarty catheter was sent till 40 cm. It was seen that the area was suitable for the anastomosis. The graft at the left side was found 10 cm upon the inguinal ligament above the anterior axillary line and the 6 mm spiral graft was anastomosed to the 7 mm with end-to-side technique. An incision of 1.5 cm was performed to the nonfibrotic part of the right femoral area. Through this incision the end of the 6 mm graft was brought to the popliteal area. The graft was anastomosed to the popliteal artery with end-to-side technique with 6/0 prolene suture. So, the axillo-bifemoral bypass was functionally completed. After the control of bleeding, all the incisions were closed. The distal pulses of both lower extremities were clearly palpable. No complication was seen at the incision lines. The cardiac performance was unaffected. Low molecular weight heparin was started at the early postoperative stage. On the tenth postoperative day Clopidogrel 300 mg (4 tablets at once) was given and it was continued as 75 mg once a day. On the following controls it was seen that distal pulses were clearly palpable. On the fifth postoperative week a multi-gated spiral tomography was performed and the grafts at both of sides were reported as patent. At the figure-1, it is shown that the graft brought from the left axillary artery, and at the figure-2 is shown that the anastomotic area of this graft and the 6 mm spiral prosthesis graft that goes to the right popliteal artery. Both popliteal artery areas are shown at figure-3.

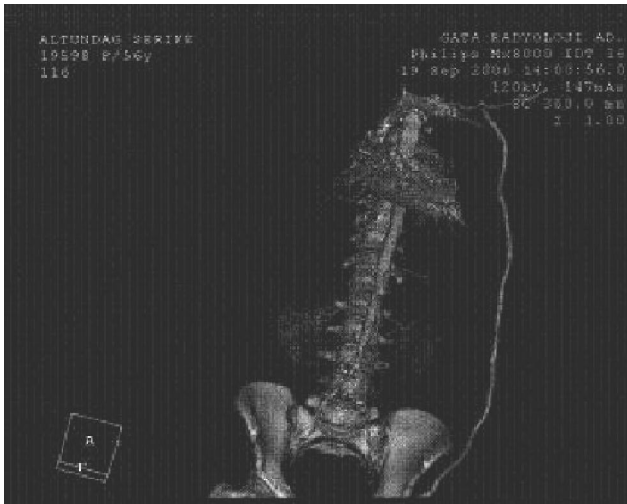


Figure-1: 7 mm PTFE graft was anastomosed to the left axillary artery.

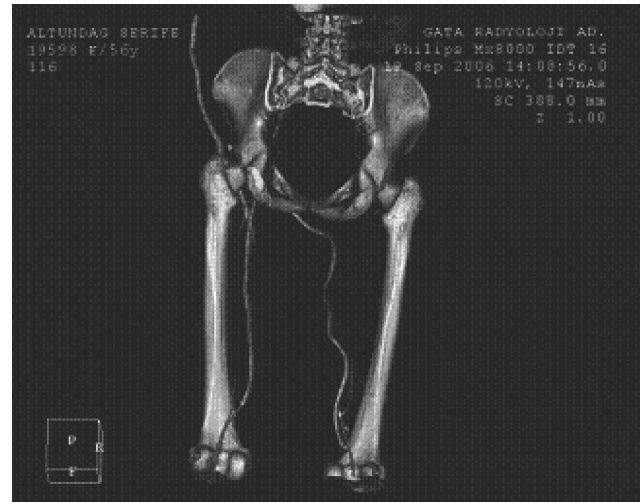


Figure-3: Popliteal arteries were seen after anastomosing the grafts.

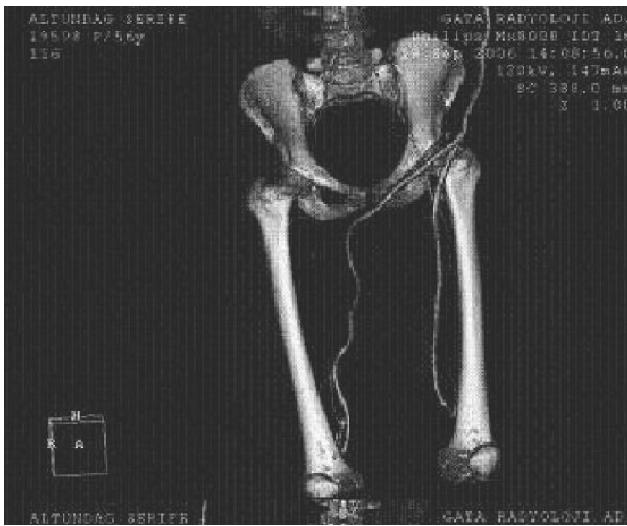


Figure-2: Right cross over bypass was performed using distal part of the 7 mm graft. Both left and right popliteal arteries were revascularized with 6 mm grafts.

DISCUSSION

Ax-PB is one of the last described techniques of Ex-AB. Ax-PB can be performed in patients with severe common, deep and superficial femoral artery atherosclerosis, in cases when Ax-FB cannot provide a hemodynamic and clinical healing or when atherosclerotic changes happen toward deep femoral artery in aortafemoral bypasses, groin infections, and in high risk cases such morbid obesity or abdominal operations.⁷

Furthermore, because of its small incision technique, Ax-PB can be performed in patients with high cardiovascular risk without causing large trauma. Ascer E. research, one of the largest series of literature, reported a 30 day mortality of 8% and a 5 year patency rate of 40%. Although they reported a primary patency rate at the end of 1st, 3rd, 5th year respectively as 58%,45%,40% the extremity salvation rate was 83%,68%,58%. Another factor that effected the graft patency rate in Ax-PB operations was the localization, below or above the knee, of the distal anastomosis. The 3 year patency rate of the Ax-PB above the knee was 67% versus 51% of those below the knee. We think that patency rate would be much higher in Axillo-bipopliteal bypasses. Bastonidis 8 has shown a patency rate of 13% in 67 patients and has determined that it should be used only for salvaging the extremity in critical ischaemias. One of the major factor that effects the graft patency in Ax-PB operations is the distal artery lumen (runoff). In our case the distal lumen was tested with Fogarty catheter and although the patient was diabetic no critical stenoses was found.

Another factor effecting the patency rate of Ax-PB is the usage of anticoagulating or antiagregating drugs. Just like in the other Ex-AB operations there is no a unified opinion on this topic. In our patient we used first low molecular weight

heparin and after that continued with Clopidogrel. We think that better results can be obtained with Glicoprotein IIB/IIIA inhibitors. As a result, Ax-PB can be used to salvage the extremity in critical ischaemias. Because the lack of widely spread and long term results, its usage in pathologies where other techniques can be performed remains limited. We think that higher patency rates can be obtained with the development of new antitrombotic drugs.

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