Concomitant Giant Indirect Inguinal Hernia Repair and Extra-anatomical Femoro-femoral Bypass

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Citation

Abstract
Extra-anatomic femoro-femoral bypass procedure is a good alternative in unilateral aorto-iliac occlusive disease in patients with high risk.
In this study, we aimed to report our case of concomitant successful giant right indirect hernia repair and extraanatomical femorofemoral bypass procedure.
The femorofemoral bypass has become a popular technique for limb salvage and disabling claudication. We suggest that it is also useful when there is a concomitant repair of an inguinal hernia.

INTRODUCTION
Femorofemoral bypass is an established procedure for limb salvage and disabling claudication(1). Extra-anatomic femoro-femoral bypass is an alternative method for unilateral aorto-iliac occlusions, especially in elderly patients with high risk and that classical vasculary bypass can't be performed or inconvenient vascular origin in anatomic localization or the risk due to this approach(2). The term “extraanatomical bypass” had been first used in nomenclature of vascular surgery by Freeman and Leed in 1952 that had carried out femorofemoral (F-F) bypass (3). But, F-F grafting procedure had been defined by Vetto in 1962 as a convenient approach for unilateral obstruction of iliac artery in patients with high risk for advanced surgical vascular reconstruction. F-F bypass grafting still keeps its priority as an alternative approach for patients with high surgical risk (4).

CASE PRESENTATION
Our case was a 65-year-old male. One year before admission to our clinic he had claudication of his left leg after a walking distance of 10 meters. He had also a right indirect inguinal hernia (Figure 1).

Our physical examination revealed loss of left femoral and distal arterial pulses. Ankle-brachial index on the left was calculated as 0.4. Color Doppler ultrasound showed low velocity and low resistance biphasic flow pattern was observed in the arteries.
Oclusion of a long segment of left common and external iliac artery was found out according to DSA angiography (Figure 2).
Blood pressure values were within the normal range. The patient had no significant changes in standard biochemical findings on admission. He was a smoker. The cholesterol and triglyceride levels were within the normal range. After all these investigations, he was referred to our clinic for revascularization.

Under general anesthesia, the priority was given to General Surgery team for inguinal hernia repair and then F-F bypass procedure was planned in this concomitant approach. First, right inguinal region was explored via longitudinal incision by preserving ilioinguinal nerve. The fascia was detached to rectus sheath medially and inguinal ligament laterally. The cord and its associated elements were suspended. The hernia was defined as indirect. The cord was incised from anteromedial side and hernial sac was prepared. Its contents were segments of small bowel (terminal ileum and appendix) (Figure 3).

The excessive part of the sac was excised (Figure 4).

A purse-string suture was placed by pushing the bowel segments inside. Transverse fascia was repaired anatomically with vicryl suture material in a continuing manner. Afterwards, to relieve the tension, a polypropylene mesh was put and hernia repair completed (Figures 5 and 6).
Then, F-F bypass procedure was carried out with 8 mm ringed tubular polytetrafluoroethylene graft (Figure 7).

All of the left lower extremity pulses were palpable (Figure 8).

**DISCUSSION**

The femorofemoral bypass has become a popular technique of reconstruction for unilateral iliac artery occlusion because of low morbidity and excellent long-term patency. Femorofemoral bypass is the procedure of choice for limb salvage in poor risk patients with adequate donor limb inflow regardless of the degree of outflow occlusive disease.

The flat muscles of the anterior abdominal wall pass down well in front of the pectineal ligament of Astley Cooper on the summit of the superior pubic rumus, thus providing space for the spermatic cord and the great vessels of the
lower limb to leave the abdomen. The transversalis fascia of the floor of the femoral canal turns down to form the medial wall of the venous compartment of the femoral sheath, and has the support of the curved edge of the lacunar ligament which effectively bars the femoral canal from entering the thigh. It is usually taught, however, that the lower end of the femoral canal passes unprotected into the thigh as the medial or third compartment of the femoral sheath, to lie between the femoral vein in its sheath and the curved edge of the lacunar ligament. If this were the case there would be no hindrance to the descent of a process of parietal peritoneum containing omentum or gut into and distending the femoral canal in the thigh. Would such a swelling, before the process of peritoneum had broken through the walls of the canal into the subcutaneous tissues of the groin, pass for a femoral hernia? Fortunately this problem does not arise.

Manenti et al reported a surgical technique for high approach to the common femoral artery, just below the inguinal ligament, which can be useful in cases of difficult dissection of the femoral region or those with diffuse fibrosis or multiple scars. It is also useful when there is a concomitant inguinal hernia to repair.

Three main criteria were taken into account while considering F-F bypass indication. These were: optimal angiographic adequacy of donor vascular structure, a palpable femoral pulse and an ankle-brachial index value of ≥1.

Some concerns had been risen about the possibility of attenuation of distal perfusion in donor extremity after femorofemoral bypass procedure. But, Ehrenfeld et al had proven experimentally that resting flow rate could increase up to 10 times of its resting value when an A-V fistula were created in the normal donor artery and no steal phenomenon had been seen in distal perfusion.

Great saphenous vein grafts usually are not used since the results with polytetrafluoroethylene (Goretex) grafts are satisfactory and readily available for different sizes regarding the diameter of the native vessel.

Subcutaneous position of the graft lies comfortable and pulsation can be felt easily at suprapubic region.

Atherosclerotic changes in distal vascular bed and whether the graft is externally supported are the most significant factors influencing the late patency rates of the F-F graft.

Grafts without external support –even if this might be saphenous vein- are exposed to pressure and easily occluded.

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