

Rare Image of a Patent Axillopopliteal PTFE Graft Bypass With Postoperative 3D-Reconstructed Angiogram

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Abstract: Extra-anatomical bypass surgery is commonly performed in patients with claudication, critical limb ischemia, or extensive aortoiliac disease and other arterial problems in the lower extremities. A single continuous axillopopliteal bypass grafting surgery is not very common. A 58-year-old male with critical limb ischemia underwent right axillopopliteal bypass surgery with polytetrafluoroethylene graft. After the surgery, periodic surveillance was performed with duplex ultrasonography and clinical assessment of peripheral pulses. Multidetector computed tomographic angiography (CTA) was also performed to determine the position and patency of the graft; it showed good contrast opacification from axillary artery to popliteal artery. CTA has become a powerful tool for assessing the potential complications of bypass grafting and for planning further therapy in a fast, reliable, and non-invasive manner.

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Key words: aortoiliac disease, axillopopliteal bypass, PTFE graft

Extra-anatomical bypass surgery is commonly performed in patients with claudication, critical limb ischemia, or extensive aortoiliac disease, and for other arterial problems in the lower extremities.¹ A single continuous axillopopliteal bypass graft surgery is not very common.² A 58-year-old male, chronic smoker with no comorbidities presented with right lower-limb rest pain for 3 months. The patient had an ankle brachial index of 0.4 with no gangrenous changes. Computed

tomographic angiogram (CTA) showed severe calcification in the infrarenal aorta with total occlusion of the right external iliac artery and small reformation at the common femoral artery, and total occlusion of the superficial femoral artery and reformation at the popliteal artery (Figure 1A). As the patient had extensive aortoiliac disease and the infrarenal aorta was not graftable, he underwent right axillopopliteal bypass with a 6 mm polytetrafluoroethylene (PTFE) graft.

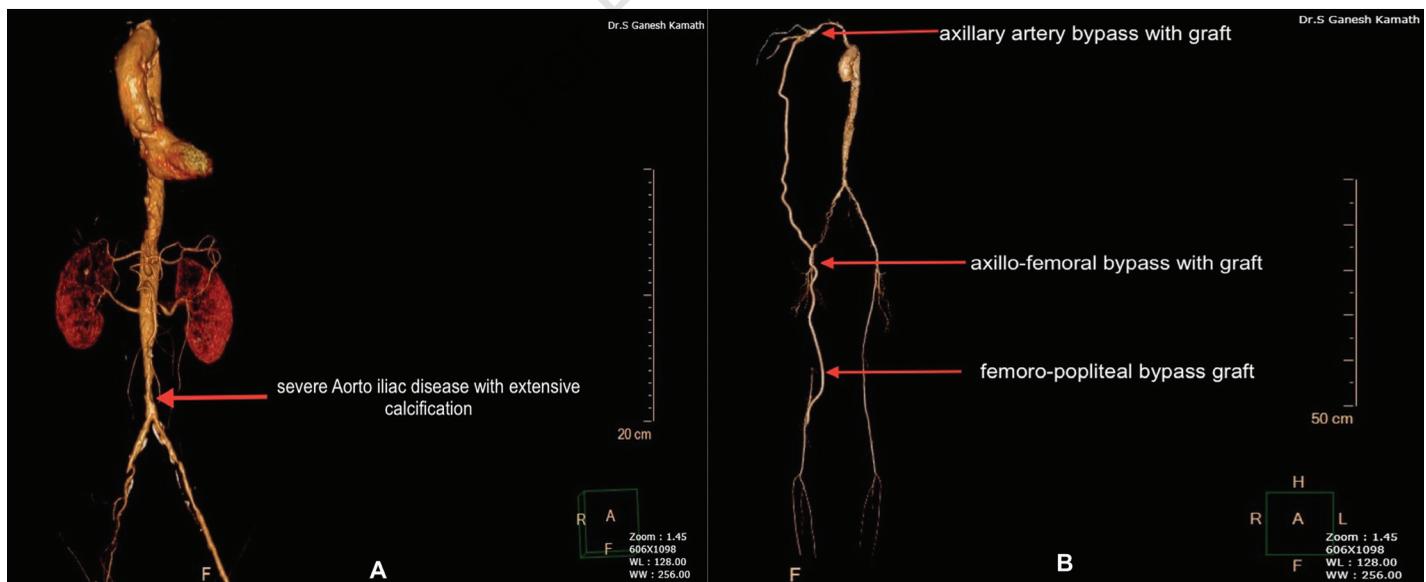


Figure 1. Reconstructed 3D image of computed tomographic angiography (CTA). **(A)** Extensive aortoiliac disease. **(B)** Postoperative check CTA showing graft flow from right axillary artery to popliteal artery after right axillopopliteal bypass with PTFE graft.

First, the axillary artery was exposed through a horizontal, 6 cm-long right infraclavicular incision 4 cm below the clavicle (the right axillary artery was normal). Next, the right common femoral artery was exposed through a vertical incision over the right groin, femoral triangle; calcification was seen in the posterior right common femoral artery and origin of the profunda femoris artery. The superficial femoral artery was totally occluded. The right popliteal artery was then exposed through a vertical incision over the lower thigh medially for about 6 cm near the knee joint; the distal superficial and proximal popliteal arteries had severe plaques, but patent lumen. Multiple small (2 cm) horizontal incisions were performed on the chest wall and right lateral side of the abdomen.

Graft tunneling was done in a subcutaneous plane. Proximally, an end-to-side anastomosis of the right axillary artery to the PTFE graft was performed with 5-0 prolene. The graft was tunneled into the right inguinal region, and a side-to-side anastomosis was achieved with the common femoral artery at the bifurcation of the superficial and profunda femoris artery. The graft was then tunneled again into the femoral triangle and brought out through the subcutaneous plane near the medial aspect of the knee joint; finally, the distal end of the anastomosis was completed with the end of a 6 mm PTFE graft to the side of the mid proximal popliteal artery with 5-0 prolene. Proper alignment of the graft was confirmed, and the postoperative period was uneventful,

with all distal pulses palpable on the right lower limb. A check CTA was done 3 months later (Figure 1B) and showed normal contrast opacification to the distal vessels and patent graft from the axillary artery to the popliteal artery, with collateral flow around the profunda femoris artery. ■

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The authors report that patient consent was provided for publication of the images used herein.

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