The Basilic Vein: An Alternative Conduit for Complex Iliofemoral Reconstruction

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WHAT THIS PAPER ADDS

- This study describes an alternative surgical approach for arterial iliofemoral reconstruction, involving the use of the basilic vein as replacement conduit. This approach may be an alternative to conventional bypass surgery with prosthetic grafts or other autologous material.

ABSTRACT

Objectives: To evaluate the basilic vein as an alternative conduit in iliofemoral arterial reconstructions.

Design: Retrospective cohort study.

Methods: We reviewed records of all patients undergoing iliofemoral arterial reconstruction with basilic vein between January 2006 and November 2011. Patients were identified via a prospective database, which also provided data on patients' comorbidity, indications for surgery and perioperative outcome. Long term outcome was confirmed by reviewing hospital records; graft patency was confirmed by clinical examination and imaging by ultrasound or CT angiography.

Results: We identified 15 patients undergoing 17 procedures (two patients underwent staged bilateral iliofemoral bypasses). Indications for vein (instead of prosthetic) graft use included prosthetic infection (4), suspected infection (2), proven hypercoagulable state (3), young age (3) and multiple graft occlusions (5). Preoperative mapping confirmed vein suitability in all cases, and all conduits were harvested from the upper limb. There were no major perioperative complications. After a median (range) follow up of 21.5 (1–42) months, all grafts were patent; one patient required secondary intervention on the graft.

Conclusion: Iliofemoral arterial reconstruction with autologous basilic vein is feasible and may be a valid alternative when the use of prosthetic material is contraindicated.

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Introduction

Iliofemoral arterial disease is, nowadays, often treated by percutaneous means with good results1; when surgery is necessary, anatomical or extra-anatomical reconstruction with prosthetic material is a valid alternative.2,3 If the use of prosthetic material is deemed unsuitable, an autologous alternative may be sought. Arm veins have a proven value as infrainguinal conduits,4 but we are not aware of their use, by other institutions, in the iliofemoral segment. The aim of this study was to evaluate our experience with basilic vein as an autologous conduit for iliofemoral arterial reconstructions.

Methods

We performed a retrospective review of all patients undergoing iliofemoral arterial reconstruction with basilic vein under our care between January 2006 and November 2011. Patients were identified via a prospectively collected database containing data on indications for surgery and perioperative outcome. Electronic and paper hospital records (including imaging databases) were reviewed to document long term outcome. The main outcome measure was graft patency: a graft was deemed patent only when this was clearly documented by follow-up imaging and clinical examination in the aforementioned hospital records. On postoperative imaging, a graft was considered patent if flow could be demonstrated within it on duplex scan, and/or contrast was seen filling its entire length on CT angiography.
arteries. Graft in (Fig. 1), the external iliac artery in six, a previously placed Dacron graft in four (Fig. 2), and the contralateral femoral artery in one.  

Results  

During the study period, 80 patients required surgical iliofemoral arterial reconstruction under our care; of these, 10 men and five women, with a median age (range) of 61 (47–85) years, underwent 17 procedures (two staged bilateral iliofemoral bypasses) where the basilic vein was used as a replacement conduit. Patients’ demographics and comorbidity were summarised in Table 1. The primary indication for intervention was prostatic graft infection (4), severe intermittent claudication (6), limb threatening ischaemia (4), false aneurysm formation (2, one potentially infected), and true aneurysm formation (1, potentially infective in origin). Indications for preferential basilic vein graft use included prosthetic graft infection (4), suspected infection (2), proven hypercoagulable state (polycythaemia rubra vera: 3), young age (3) and multiple prosthetic graft occlusions (5). Eleven patients had undergone up to four previous arterial surgical procedures on the same limb, which had failed because of infection (4), aneurysmal degeneration (2) or occlusion (5). Four patients had also undergone at least one angioplasty of the iliofemoral segment, with or without stent placement.

Preoperative ultrasound confirmed vein suitability in all cases, and all conduits were harvested from the upper arm (above the elbow). Surgery was performed electively in nine cases only (six cases of claudicatio, two of limb-threatening ischaemia and one of false aneurysm formation). The basilic vein was used in a non-reversed fashion after valve lysis in most cases (9), to match the diameters of the inflow and outflow arteries. Graft inflow was the common iliac artery in six cases (Fig. 1), the external iliac artery in six, a previously placed Dacron graft in four (Fig. 2), and the contralateral femoral artery in one. Outflow was the common femoral artery in six cases (with both profunda femoris and superficial femoral artery patent), the profunda femoris in eight, and a previously placed distal graft in three. Postoperatively, all patients were offered follow up by clinical review, serial duplex scans and selective CT angiography.

There were no major perioperative complications, but one patient experienced paraesthesia in the territory of the medial cutaneous nerve of the forearm following vein harvest. Median (IQR) postoperative hospital stay was 3 (2–8) days. Two patients required further infrainguinal vein bypass surgery during the same admission (one simultaneous, one delayed), to achieve limb salvage.

There was no loss to follow up, but two patients died of unrelated causes 15 and 36 months postoperatively. After a median (range) of 21.5 (1–42) months, all grafts were patent. None of the grafts developed aneurysms. Secondary intervention (percutaneous angioplasty) was necessary in one patient only, for a symptomatic distal anastomotic stenosis causing intermittent claudicatio, six months after surgery. One patient underwent endovascular aneurysm repair through the previously placed basilic vein conduit: the minimum measured diameter of this conduit on the preoperative CT scan was 9.6 mm.

Discussion  

This small study demonstrates the utility of the upper arm basilic vein as a proximal arterial conduit in situations where prosthetic grafts were likely to result in poor outcome. Due to necessity (no other autologous alternative), we begun using the basilic vein for in-situ replacement of infected prosthetic grafts; success in this setting encouraged us to expand our indications.

The basilic vein is often employed for vascular access or infrainguinal reconstructions, but its use in the iliofemoral segment had not been previously reported. In the upper arm, the vein is often a good vessel, generally matching the iliofemoral arteries in size (Figs. 1 and 2). As its deep position protects it from venepuncture, cannulation and phlebitis, in our limited experience, we have not encountered a patient without a vein of adequate calibre on preoperative ultrasound.

Various authors have used femoropopliteal veins for aortoiliac reconstruction in infection or young patients. In contrast, basilic vein harvest is a well tolerated procedure, perhaps a more attractive option in many cases. Conduit length may be an issue,
although this can be addressed by bilateral harvesting (not performed in our series). Although there is little data in the literature, the greater saphenous vein is another potential autologous option. Size could be an issue, as its diameter is generally smaller than that of the basilic vein above the elbow, but this can be addressed, if necessary, by constructing a panelled graft. Another limitation may be its previous harvest, or the wish to preserve it for future infrainguinal bypass: of our patients, two required further ipsilateral infrainguinal surgery, and four had their ipsilateral greater saphenous vein harvested for previous bypass surgery.

This study does not prove the superiority of basilic vein conduits as a routine alternative to prosthetic grafts in the iliofemoral segment. We deliberately chose not to compare our cases to conventional prosthetic reconstructions because of the obvious peculiarity of our patient population, and because the small sample size and relatively short follow up would have precluded meaningful conclusions. Furthermore, indications for preferential basilic vein use were not agreed at the outset, and became more liberal during the study period. Currently, assuming length is not a limiting factor, we would use a basilic vein conduit in preference to a femoral vein or a cryopreserved homograft in cases where the use of prosthetic material was deemed inappropriate.

In conclusion, iliofemoral reconstruction with basilic vein conduits is feasible, and, according to our limited experience, potentially durable even in unfavourable situations; it may be considered as an alternative to prosthetic grafts and femoropopliteal veins in selected cases.

**Conflict of Interest/Funding**
None.

**References**