

Endovascular Revascularization of Chronically Occluded Aortofemoral and Femoropopliteal Bypass Grafts Using the “Collect to Tip” Technique

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Relevance

Chronic occlusion of aortofemoral (AF) and femoropopliteal (FP) bypass grafts remains a major challenge in the management of patients with peripheral arterial disease (PAD). The main causes of occlusion include progressive atherosclerosis, perianastomotic stenosis due to intimal hyperplasia, early technical errors, impaired inflow/outflow, and thrombotic complications. Conventional treatment options — open surgery, hybrid procedures, endovascular interventions, and thrombolysis — carry risks of distal and proximal embolization. Therefore, safer and more predictable methods for restoring graft patency are needed.

Aim of the Study

To evaluate the effectiveness and safety of the author’s “Collect to Tip” technique in endovascular revascularization of completely occluded AF and FP bypass grafts.

Materials and Methods

The study was conducted at Baku Health Center: 38 patients (34 male, 4 female), Mean age — 66 years. Types of occlusions: 10 aortofemoral bypass grafts, 28 femoropopliteal bypass grafts. Comorbidities: Diabetes mellitus — 68%, Outflow occlusion — 21% , Inflow stenosis/occlusion — 7%. Clinical presentation (Rutherford classification): Stage III — 64%, Stage IV — 22%, Stage V — 14%.

Technique

The method consists of at least two stages, with an interval of 12–24 hours and continuous anticoagulation.

- **Access:**
 - AF — ipsilateral common femoral artery (CFA)
 - FP — contralateral CFA
- **Devices/medications:**
 - Actilyse 10–20 mg (without continuous infusion)
 - Thrombectomy (Penumbra)
 - Balloon angioplasty (Oceanus, Mustang)
 - Self-expandable peripheral stents (Protégé, iVolution)

- 8F introducer (AF — 12 cm, FP — 45 cm)

- **Principle:**

- First stage — thrombolysis and thrombectomy without aggressive manipulation of the distal anastomosis.
- Objective — to “collect” thrombotic material toward the distal end of the graft (Collect to Tip)
- Second stage — final mechanical cleaning and PTA

Results

Follow-up: mean 9.5 months, with assessments at week 1, months 1, 3, 6, and 1 year (Doppler US).

- Primary patency: 84%
- Secondary patency: 89%
- Major amputations: 2.6%
- Minor amputations: 5.3%

Clinical cases demonstrate successful restoration of blood flow in occlusions of varying length and complexity, including AF and FP grafts occluded for 1–3 years.

Conclusions

The proposed “Collect to Tip” technique:

- reduces the risk of distal embolization through a stepwise approach,
- increases the effectiveness of thrombolysis,
- allows safe PTA of distal graft segments,
- improves primary and secondary patency rates.

The technique has proven to be safe and effective and may be considered a preferred endovascular strategy for treating occluded AF and FP bypass grafts.