Popliteal Endarterectomy for Localized Popliteal Artery Disease

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Background: The incidence of localized popliteal disease is rare. Currently, patients presenting with symptomatic popliteal disease are offered femoropopliteal or tibial bypass if the disease is not amenable to radiologic intervention. We feel that popliteal endarterectomy by means of a posterior approach with patch angioplasty as a primary procedure is a viable surgical option. Our aim was to assess the durability of popliteal endarterectomy in patients with localized popliteal disease, in which radiologic intervention is not feasible.

Methods: This is a retrospective review of all patients who underwent popliteal endarterectomy for localized popliteal disease in our institution over the past 3 years. All patients underwent a preoperative assessment with computed tomography angiography. Angioplasty was attempted in all patients before surgical intervention. Patency was assessed radiologically 6 weeks after operation. Patients had follow-up appointments at intervals of 6 weeks, 3 months, 6 months, and a year after surgery.

Results: A total of 7 patients (5 men and 2 women) underwent popliteal endarterectomy. The mean age was 64.3 years, with a mean follow-up period of 9.9 months (range, 2−26 months). Four patients were treated for activity-limiting claudication (<100 yards), whereas 3 patients were treated for ischemic rest pain. The procedural success rate was 100% without mortalities or in-hospital morbidities. Symptomatic resolution was achieved in 6 patients. One patient occluded 1 month after endarterectomy because of a critical stenosis at the tibial bifurcation.

Conclusions: Popliteal endarterectomy through posterior approach is advantageous in managing popliteal artery pathology restricted to the popliteal fossa. It is safe with good short-term results.

INTRODUCTION

It is rare for patients to present with isolated popliteal disease. It is also difficult to establish the exact incidence, as most publications report femoropopliteal disease as a single disease entity. As with femoral disease, the symptoms can range from nondisabling claudication to critical limb ischemia. The surgical treatment for popliteal occlusive disease has evolved over the years. Surgical endarterectomy was the first-described procedure for treating femoropopliteal occlusive disease,[1] followed by surgical bypass using an autologous vein. Although synthetic grafts and endovascular interventions have been introduced as alternative treatment modalities, the use of autologous grafts remains the superior option.[2−5]

Femoropopliteal endarterectomy was first described in the 1940s.[1] Few historical studies have compared popliteal endarterectomy and surgical bypass using an autologous long saphenous vein (LSV); these studies have produced mixed results.[6−9] Nonetheless, the utilization of surgical bypass has undoubtedly surpassed that of endarterectomy.

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We believe that popliteal endarterectomy through posterior approach with short saphenous vein (SSV) angioplasty as a primary procedure is a viable surgical option.

In this review, we aim to assess the durability of popliteal endarterectomy with vein patch in patients with localized popliteal disease, which is not amenable to radiologic intervention.

METHODS

This is a retrospective review of all patients who underwent popliteal endarterectomy for localized popliteal disease (between 2011 and 2013) in our institution. All patients underwent a diagnostic computed tomography angiography (CTA) including the aortoiliac segment to confirm disease distribution and to exclude major inflow disease before intervention. After which, all patients underwent a formal angiography to confirm localization of disease within the popliteal artery and the presence of adequate proximal inflow vessels and at least 1 outflow crural vessel to the foot. Angioplasty was attempted in all patients. Only those with failed angioplasty and significant ischemic symptoms were offered surgical endarterectomy. Angioplasty was considered a failure if there was no evident resolution of the lesion angiographically and no change in patient's symptomatology. As the patients' limbs were not imminently threatened, we usually waited for 2 weeks after attempted angioplasty before surgical intervention.

To qualify for popliteal endarterectomy, the disease had to be distal to the adductor hiatus superficial femoral artery (SFA) and not involving popliteal bifurcation. In addition, all patients had to have an SSV suitable for patch angioplasty, assessed by preoperative duplex scan (diameter >2 cm without varicosities).

In the immediate postoperative period, patients were assessed clinically for symptomatic resolution (absence of ischemic rest pain and ability to walk >100 yards) and a focused duplex confirming flow in the popliteal artery. Patency was assessed radiologically (CTA, 2 patients; duplex scan, 5 patients), 6 weeks after operation (Fig. 1). Patients were followed up routinely at 6 weeks, 3 months, 6 months, and a year after surgery. Patients were not subjected to repeated imaging, unless there was a clinical suspicion of restenosis or occlusion. Assessments of patients' preoperative and postoperative ankle-brachial pressure index (ABPI) and Rutherford score were recorded as a measure of procedural success.

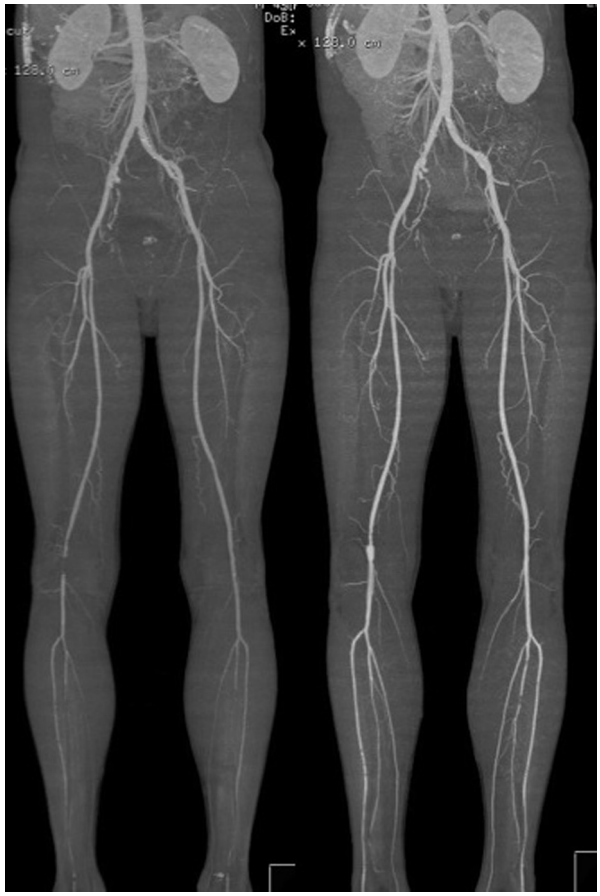

Fig. 1. CT angiogram picture before and after popliteal endarterectomy.

OPERATIVE PROCEDURE

Patients were placed in the prone position. A lazy S-shaped incision was performed over the popliteal fossa. The SSV was identified and mobilized (Fig. 2). After exposure of the popliteal artery, patients were heparinized before arterial clamping. A single longitudinal arteriotomy was performed and extended proximal and distal to the diseased segment. Endarterectomy was completed using a Watson–Chain dissector. The distal flap was cut sharply and tacked using 7-0 prolene. Inflow and back bleeding were checked before suturing the SSV vein patch with 6-0 prolene (Fig. 3).

RESULTS

A total of 7 patients (5 men and 2 women) underwent popliteal endarterectomy. The mean age was 64.3 years. All patients had at least 2 cardiovascular risk factors (Table I). The mean follow-up period was 9.9 months (range, 2–26 months).