SHORT REPORT

Iatrogenic Femoropopliteal Graft Entrapment Leading to Thrombus Formation

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Femoropopliteal bypass graft entrapment by the gastrocnemius muscle and tendons is an unusual cause of graft stenosis or thrombosis. Before graft occlusion occurs, reduced flow may be seen either with the knee in extension or hyperextension or by passive dorsiflexion of the ankle. We report a case of a femoropopliteal bypass graft entrapment causing a thrombus in the distal graft. Duplex imaging, angiography, MRI and graft surveillance programs are useful diagnostic tools. Treatment options include dividing the occluding muscles and tendons and rerouting the graft.

Keywords: Femoropopliteal bypass graft; Entrapment; Tendon; Thrombosis.

Introduction

Popliteal artery entrapment syndrome is a well recognised anatomical variant since the term was first coined by Love and Whelan.1 The popliteal artery is compressed by several congenital anatomical variants of the insertions of the gastrocnemius muscle as described by Fowl and Kempczinski.2 A similar entity caused by entrapment of a femoropopliteal bypass graft by muscles and tendons around the knee joint has also been described.3,4

Report

A 72-year-old man presented to the emergency department of our hospital with critical right foot ischaemia. His past medical history included long-standing peripheral vascular disease with previous toe amputations. He was not a smoker and there was no history of diabetes or hypercholesterolaemia. He underwent a right below knee femoropopliteal bypass graft, using reversed long saphenous vein, with no post-operative complications. Surveillance duplex imaging was satisfactory until the 12-month scan when low velocities in the distal graft were noted. Stenosis in the distal graft was suggested by angiography (Fig. 1) and on exploration of the right femoropopliteal vein graft a thrombus was confirmed. The graft was found to be sandwiched between semitendinosus and gracilis tendons superficially and the medial head of gastrocnemius deep to it. Part of the vein graft with attached thrombus, was removed and repaired using long saphenous vein. The tendons of semitendinosus and gracilis were divided and the medial head of gastrocnemius was partly divided to make room for the graft to sit without compression (Fig. 2). There were palpable pulses and good Doppler signals distally at the end of the procedure. Graft surveillance scans post-operatively have been satisfactory.

Discussion

Femoropopliteal bypass grafts may be trapped either between the medial head of gastrocnemius muscle and the posterior surface of tibia4,5 or between the medial head of gastrocnemius muscle and the tendons of semitendinosus and gracilis.6 The latter was the case in our patient. A report of iatrogenic entrapment in 19936 noted only six cases of iatrogenic graft entrapment due
to faulty tunnelling superficial to the medial head of gastrocnemius prior to that. Others found four more cases reported since then,\(^4\) making our case possibly the 11th reported case of this condition.

The flow through the graft is normal at rest. Occlusion is typically seen with the knee in extension or hyperextension or with passive dorsiflexion at the ankle.\(^4\) Persistent trauma to the vessel wall during knee movements leads to degenerative changes, stenosis, thrombosis, or aneurysm formation.\(^3\) In our patient entrapment of the graft led to a local thrombus, which required exploration. Duplex imaging, angiography and MRI can be used to diagnose the condition by using various provocative manoeuvres.\(^3\)–\(^5\) The entrapment can be corrected by dividing the occluding muscles and tendons, or rerouting the graft.\(^6\)

It is important to bear this potential hazard in mind in all patients requiring infrageniculate femoropopliteal bypass graft. Care must be exercised to avoid this complication.

**References**


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