SHORT REPORT

Percutaneous Retrograde Tibial Access in the Endovascular Treatment of Acute Limb Ischaemia: A Case Report

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The utilization of a retrograde tibial approach in lower limb endovascular therapy has been described in the published literature. In this article we report our recent experience in order to highlight this valuable and under-utilised technique, which was successful in a difficult case where a conventional approach failed.

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Introduction

The utilisation of a percutaneous retrograde tibial approach in lower limb endovascular therapy has been described in the published literature. We have recent experience of using this technique in a case with great success. As a result, we would like to highlight this under-utilised technique, which is particularly valuable in difficult cases where a conventional approach has failed.

Report

A 78-year-old farmer with a history of intermittent claudication presented with severe foot pain due to acute ischaemia. The ankle brachial pressure index was recorded at 0.29. After an arterial duplex study revealing popliteal occlusion, endovascular therapy was pursued.

Informed consent was obtained from the patient. Digital subtraction angiography was then performed after securing antegrade common femoral arterial access and placing a 5F Avanti+ endovascular sheath at this site (Cordis, Miami, FL). The popliteal artery was found to be completely occluded over 15 cm, with filling of the trifurcation distally via collaterals (Figs. 1, 2). Both the anterior and posterior tibial arteries had proximal stenoses with the anterior tibial artery providing dominant flow to the foot. It was decided to treat these lesions using balloon angioplasty.

After failing to re-enter the distal true lumen to successfully cross the popliteal lesion using a subintimal antegrade approach despite several attempts, retrograde anterior tibial access was secured on the lower anterior surface of the leg. This was achieved under direct ultrasound guidance with a 5-13 MHz multi-frequency linear probe and Sonoline G50 Ultrasound System (Siemens Medical Solutions, Erlangen, Germany) using a Check Flo Performer Van Andel introducer micropuncture set to place a 4-French sheath (Cook Inc., Bloomington, IN). While the usual puncture described for this technique is in the foot, in this case the anterior tibial artery was found to be larger in calibre and more amenable to puncture at the lower leg.

The proximal anterior tibial and popliteal lesions were then crossed from below using a 0.018-inch
V18 control wire (Boston Scientific/Medi-Tech, Natick, MA) and a 3-French straight catheter (Balt, Montmorency, France). After administering 5000 units of heparin, both of these lesions were angioplastied with a 3 mm diameter Wanda balloon catheter (Boston Scientific/Medi-Tech, Natick, MA) using this retrograde anterior tibial approach.

To allow further treatment of these lesions using the larger diameter balloons available it was necessary to approach the lesions from above. To achieve this, an Amplatz gooseneck snare (EV3, Plymouth, MN) was deployed from the original femoral access site to capture the 0.018-inch guidewire, which had crossed the lesions from below, in the superficial femoral artery. This guidewire was then exteriorised at the femoral site and used to pass a 4-French straight catheter (Cordis, Miami, FL) across the occlusion from above. This catheter was then used to exchange the 0.018-inch wire for a 0.035-inch Bentson wire (Boston Scientific, Natick, MA) at the femoral access site.

The rest of the procedure was then performed in a conventional manner using an antegrade common femoral approach. Balloon angioplasty of the popliteal, proximal anterior tibial and posterior tibial lesions was performed, using 6 × 100 mm and 3 × 80 mm Opta-Pro balloon catheters (Cordis, Miami, FL), with a good angiographic result (Fig. 3).

A rapid resolution of pain followed with a post therapy ankle brachial pressure index recorded at

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**Fig. 1.** Pre-procedural angiogram demonstrating popliteal artery occlusion.

**Fig. 2.** Filling of the trifurcation distally via collaterals.
0.57. The patient was discharged at day three after intervention and remains well at six weeks.

Discussion

Endovascular therapy is emerging as the dominant technique in the invasive treatment of peripheral arterial disease. In most cases this can be achieved crossing the lesion endoluminally or subintimally from either a contralateral retrograde or ipsilateral antegrade approach. However, there are lesions that cannot be successfully crossed with a guidewire using these conventional approaches, particularly more distal lesions. We used a retrograde approach from the anterior tibial artery to successfully treat this patient with acute limb ischaemia. This has only become possible with the availability of micropuncture systems and smaller catheters.

This technique has been previously described in patients with chronic critical ischaemia.\(^1\)\(^2\) Outcomes appear comparable to more conventional approaches.\(^3\) We would like to highlight this valuable but under-utilised technique, which can be of use in difficult cases.

References


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