CASE REPORT

Lateral intermuscular approach to anterior tibial artery: A case report

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Abstract

Infra-inguinal bypass to anterior tibial artery for critical limbs are commonly performed via interosseous route. Lateral intermuscular route is an alternative to it.

We present a case of a 48-year-male who presented with digital gangrene due to popliteal artery occlusion.

Patient had arteriography suggestive of occlusion in the popliteal artery therefore the patient was taken to operation room department and underwent left femoral to anterior tibial artery bypass using lateral intermuscular route. We report this to emphasize the technical feasibility of this technique.

Keywords: critical limb ischemia, lateral approach, digital gangrene, distal bypasses

Introduction:
Infra-inguinal bypass surgeries for critical limb ischemia are due to multi-segmental disease. The anterior tibial artery is used as the outflow vessel in 10 to 20% of infra-inguinal bypass surgeries.[1]

The interosseous is the most commonly used route. It is technically difficult to perform and have issues like difficult graft monitoring, risk for neurovascular injuries. They can be difficult to used in patients with popliteal fossa scarring and having active infection. Lateral intermuscular[3] is an alternative route. We present the report of a femoral to anterior tibial artery bypass using 'lateral intermuscular route'

Case Report:
A 48-year-old-man known smoker, diabetic and hypertensive presented with history of intermittent claudication for a year. He now presented-with continuous rest pain for a month duration in September 2016. The pain was excruciating and severe enough to require intravenous analgesics. His left popliteal, posterior tibial and dorsalis pedis pulses were not palpable. The rest of physical examination was unremarkable. Conventional angiogram showed complete occlusion of the left popliteal artery with reformation of anterior tibial artery (ATA) through multiple collaterals. This was the only runoff vessel up to ankle joint (Fig 1). Venous mapping did not showed suitable vein to be used for bypass.

Patient had a popliteal artery angioplasty with early thrombosis. He was planned for femorodistal bypass. Superficial femoral artery was exposed through longitudinal medial thigh incision. The anterior tibial artery was exposed through longitudinal incision placed in the upper third of the tibia and fibula.

For lateral approach of the anterior tibial artery, tunnel was created posterior to the knee joint from medial to lateral between the biceps and semi-membranosus muscles. A counter-incision was placed on the lateral side of the left lower

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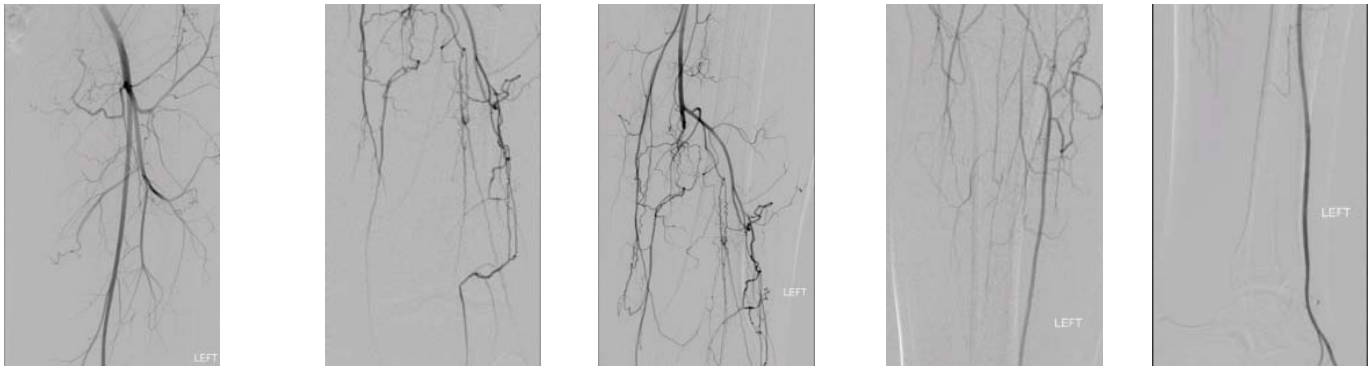

Figure 1: . Diagnostic angiogram showing normal looking common , profunda and superficial femoral arteries , occluded popliteal artery with extensive collatral formation around knee joint.The anterior tibial atery is the only runoff vessel reaching upto ankle joint and of adequate caliber .

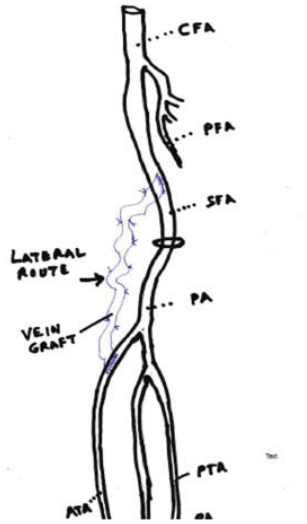

Figure 2: . Diagram Showing Lateral intermascular route for anterior tibial artery revascularization (CFA: Common Femoral A; PFA: Profunda Femorious A; PA: Popliteal A; ATA: Anterior Tibial A; PTA:Posterior Tibial Artery

thigh. A subcutaneous tunne[l] was made between this incision and to the anterior tibial artery. Special care was made to prevent injury to the neurovascular bundle behind the knee joint and to protect the common peroneal nerve around the head of the fibula. As patient was not having the suitable vein except a short segment, the composite graft was made. Ringed PTFE 5mm graft was placed in the tunnel created ensuring smooth curves and the length was checked in full extension and flexion of the knee joint. After ensuring the correct orientations of the graft, proximal and distal anastomosis was created in an end–to-side fashion. Patient had palpable anterior tibial pulse at the end of procedure. Patient had a smooth post-operative course and was mobilized on 2nd post-operative day. His rest pain settled and he was discharged on the 5th post-operative day. He remained pain free and with patent graft for next 6-months. He was asymptomatic and was active.

Discussion:

Lateral intermuscular approach, is an under-used one and an alternative to the conventional routes for by passing to anterior tibial artery.[4] The overall 5-year secondary patency rate was 70-86%.[5]

Being subcutaneous, it can easily be monitored. This route is useful in patients with popliteal fossa scarring and active infection. As it does not pass through the interosseous memebrane, it avoids compression due to regrowth, an issue faced by the interosseous route.[6] The incidence of wound infections was also found to be lower in lateral intermuscular than in interosseous approach.[1]

There is a concern of possible compression of the graft for being subcutaneous, although this has not been shown clinically. Eslami et al.[1] showed similar patency rates in pretibial, interosseous and lateral routes, the choice of routing should depend upon availability and length of autologous graft, surgeon's choice and other circumstance specific to the patient.

Conclusion:

The lateral intermuscular route is an alternative route and can be considered in selected patients for bypass to anterior tibial artery.

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Role and contribution of authors:

Dr Zia Ur Rehman, conceived the idea, collected the data, references and did the initial write up.

Dr Waryam Saleh, collected the data, referecnes and helped in discussion writing.

Dr Ziad Sophie, critically review the article and made final changes.

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