Obtaining a superficial femoral artery graft in adolescents and children with the deep femoral artery transposition

BEDNARKIEWICZ, Marek, et al.

Abstract

A new technique to obtain a segment of the superficial femoral artery as an arterial conduit in young patients while an unobstructed peripheral blood flow is maintained by superficial femoral artery-deep femoral artery transposition is illustrated with two clinical examples. The explanted arterial autograft requires no replacement by another graft and provides a conduit of up to 10 cm in length. Excellent results were achieved in both patients at 1 year. This technique is recommended instead of saphenous vein conduits in very young patients because of the risk for late vein degeneration.

Reference


DOI : 10.1067/mva.2001.109762
PMID : 11174800
Obtaining a superficial femoral artery graft in adolescents and children with the deep femoral artery transposition

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A new technique to obtain a segment of the superficial femoral artery as an arterial conduit in young patients while an unobstructed peripheral blood flow is maintained by superficial femoral artery–deep femoral artery transposition is illustrated with two clinical examples. The explanted arterial autograft requires no replacement by another graft and provides a conduit of up to 10 cm in length. Excellent results were achieved in both patients at 1 year. This technique is recommended instead of saphenous vein conduits in very young patients because of the risk for late vein degeneration.

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Preoperative evaluation and technical aspects. The preoperative evaluation includes an aortofemoral arteriography, from which vessel quality, accessibility, and location are determined (Fig 1). The SFA and DFA are exposed directly through an anteromedial approach. The DFA is carefully exposed as distally as possible, but left in place, thus avoiding interference with perforating intramuscular branches. A relative small diameter is not a contraindication, because the DFA tends to be spastic, particularly in young patients. The SFA is then dissected with a no-touch technique. Approximately 2 cm of the SFA must be freed to perform the SFA-DFA anastomosis.

Case 1. The first case concerns a 14-year-old boy who was operated on for appendicitis. Postoperative complication was complicated by repeated episodes of mechanical ileus, with intestinal ischemia, due to bowel adhesions. Each event required resection of portions of the small intestine and eventually its complete resection. Weight loss ensued and growth ceased. Fortunately, the patient had a homozygous twin who consented to be a small-bowel donor. Direct implantation of the mesenteric artery onto the aorta was technically unfeasible because of the short length and small size. The DFA was preferred to be the bypass graft conduit, particularly in young patients, has led us to adopt a new concept of obtaining a segment of a patent artery, while maintaining an unobstructed blood flow. A segment of the SFA as conduit and transposition of the distal SFA to the DFA were used. In the current article we describe preoperative considerations, the operative technique, and the results in two cases where this technique was used.

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the DFA should not have a diameter less than 70% of the SFA at the site of the anastomosis. Usually, in these young patients, it is possible to retrieve up to 10 cm of graft material from the SFA (Fig 2). After systemic heparinization, the SFA segment is extracted. Proximally, the SFA is ligated, and the remaining distal part of the SFA is anastomosed end to side to the DFA.

DISCUSSION
The superior long-term results with arterial conduits are well documented.6-8 Since Wylie et al9 introduced the use of the external and internal iliac arteries as arterial bypass graft conduits, these arteries have been used frequently. The SFA has been used in renal and carotid artery reconstructions.6,10,11 The limitation of using the internal iliac artery as a conduit is the length (only a few centimeters), and removal of either the external iliac artery or the SFA requires replacement with polytetrafluoroethylene or saphenous vein grafts. In young patients and children, prosthetic materials should be avoided. Vein grafts have a tendency to degenerate over the years, and aneurysm formation may occur, with risk for thrombotic obstruction or distal embolization,6,7 as in case 2. The SFA-PFA transposition allows for retrieval of an SFA graft that is longer than any other arterial graft (10 cm), without the need for an SFA segment replacement with venous or prosthetic graft. This technique is contraindicated in the presence of diffuse atherosclerotic disease of the lower limb and, thus, is most suitable in children and young patients with a normal arterial vascular tree.

CONCLUSIONS
The SFA-DFA transposition provides a valuable means for obtaining arterial autografts. It should be considered instead of saphenous vein conduits in very young patients because of the risk for late saphenous vein degeneration.