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RESEARCH ARTICLE

RETROSPECTIVE ANALYSIS OF INFRAPOPLITEAL BYPASS PROCEDURES :3 YEARS INSTITUTIONAL EXPERIENCE

Prof. N. Sritharan MS. Mch, Dr. Sabarish Kumar MS., Dr. Ilayakumar MS. Mch, Dr. Velladuraichi MS. Mch and Dr. Prathap Kumar MS. Mch

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Abstract

Introduction:-

For many years, the classic treatment approach for CLTI has been open surgery. The value of the femoral-to-distal artery bypass in limb salvage is well documented.However there has been a belief that bypasses to distal tibial arteries have high chances of graft failure. And the use of the superficial femoral artery or the popliteal artery as the source of inflow for distal bypasses has been criticized.In this article we report our 3 years experience with infrapopliteal bypasses and its analysis in terms of limb salvage and patency rates. Other factor known or suspected of influencing graft patency, including etiology were also evaluated to study their effect on the long-term results of these grafts.

Materials And Methods:-

All the patients who have undergone infrapopliteal bypass procedure in Institute of Vascular surgery,Madras Medical college,Chennai from 2016 to 2018 were included in the study.All these procedures are non sequential bypasses performed for limb threatening critical limb ischemia.Patients who have previously undergone any revascularization for the same limb,redo bypasses and patients who have undergone concomitant proximal inflow correction are excluded from the study.

Post operatively graft surveillance was carried out at 3rd ,6th month and at the end of 1year.Pulseexamination,ABI measurement and duplex scan surveillance was done.

Primary patency of the grafts and limb salvage rates at 1 year were assessed.

Results:-

79 patients were included in the study(2016 – 32,2017 – 23, 2018 – 24). Out of which 71(89.8%) were men and 8(10.1%) were women.Mean age of presentation is 50.1. Etiology was atherosclerosis in 57(72.1%) patients and TAO/non-specific arteritis in 22(27.8%) patients(based on inflammatory markers and shionoya criteria).The etiology wise distribution is given in figure 1.Reversed great saphenous vein was used as conduit in 78 cases(98.7%) and PTFE graft was used in 1 case(1.2%).Inflow was taken from common femoral artery in 45 cases(56.9%) ,superficial femoral artery in 22 cases(27.8%) and popliteal artery in 12 cases(15.1%)(figure 2).Distal anastomosis was done to TP trunk – 16(20.2%),Anterior tibial artery – 16(20.2%) (mid – 9,distal-5,proximal-2),Posterior tibial artery – 38(48.1%) (mid PT- 13,proximal-17,distal-8),Peroneal artery – 8(10.1%) and Dorsalis pedis artery - 1 (1.2%)(Figue 3).

Corresponding Author:- Prof. N. Sritharan MS. Mch

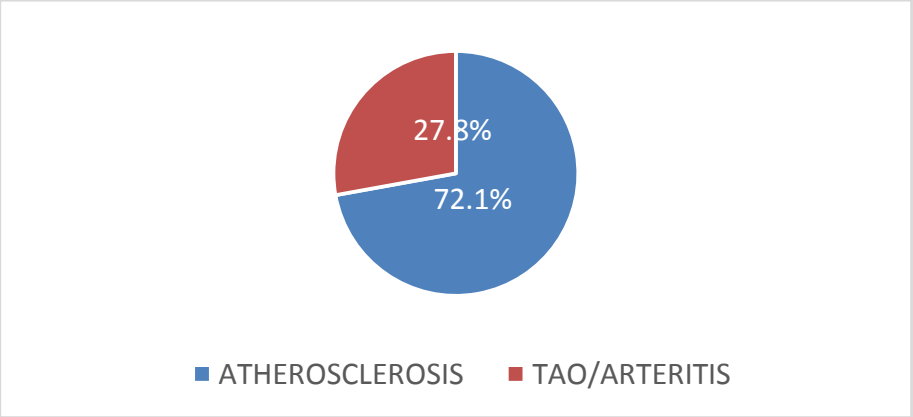

Figure 1:- Distribution based on the etiology.

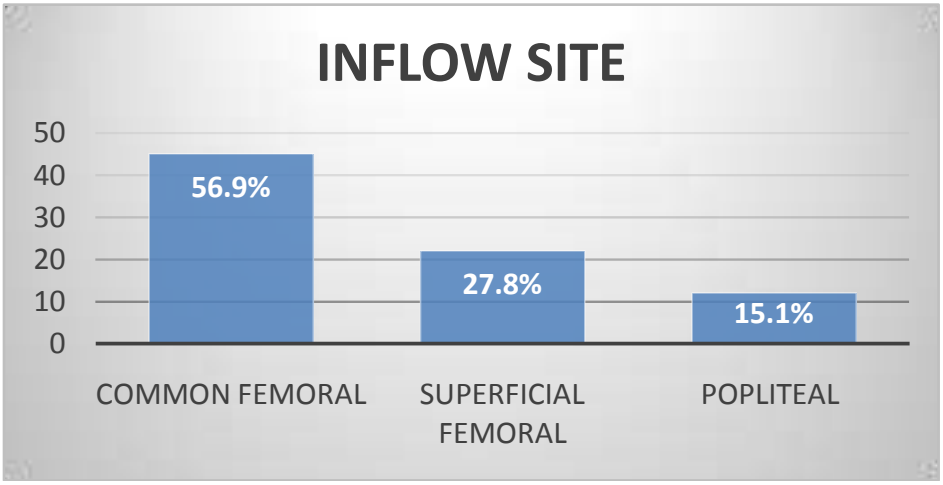

Figure 2:- Distribution of inflow sites.

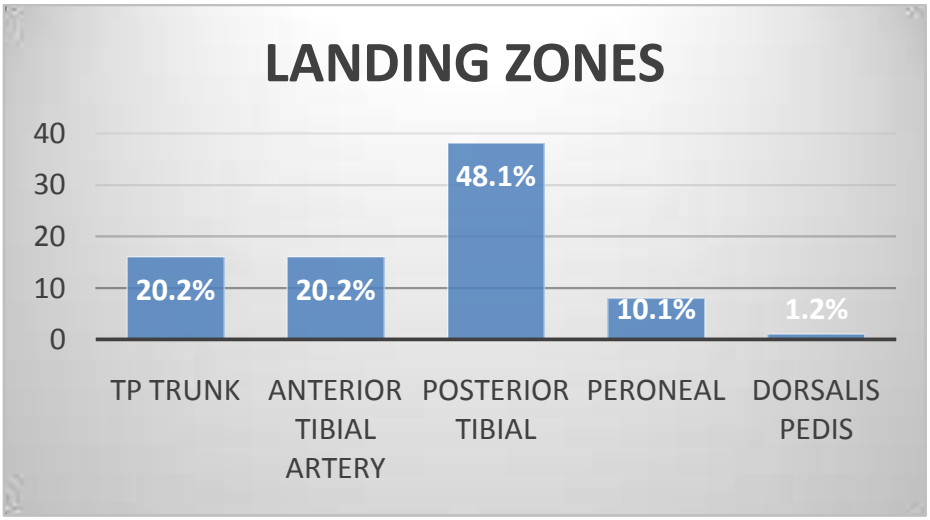

Figure 3:- Distribution of landing zones.

During the follow up period,9 patients expired due to various causes.17 patients lost follow up and could not be contacted.So the analysis of patency and limb salvage was done in remaining 53 patients.

Graft patency and limb salvage:
At the end of 1 year graft was patent in 35 patients(66.03%) , thrombosed in 17 patients(32.07%)and it was failing in 1 patient(1.8%).3 patients landed up in major amputation.Limb salvage rate was 94.3%.

Among the 17 graft failure cases,in 8 patients graft was thrombosed on the same day.5 of them underwent graft thrombectomy on the same day ,but only one discharged with patent graft.

Etiology:
Among the 17 thrombosed grafts , 12(70.5%)patients fall in TAO/non-specific arteritis arm.In remaining 5(29.4%) patients the etiology was atherosclerosis.Among the thrombosed grafts,more patients fall under TAO/non-specific arteritis.

Inflow site:
Patent grafts with inflow from CFA were 11(57.1%),SFA were 9(60%),popliteal were 6 (75%).Grafts originating from popliteal and superficial femoral artery found to have patency equivalent to that arises from common femoral artery.Results are summarized in Table 1.

Table 1:- Results of the study.

PARAMETER	NUMBER	PERCENTAGE
Graft patency at 1 year	35	66.03%
Limb salvage rate at 1 year	50	94.3%
Thrombosed grafts	17	32.07%
TAO/Non-specific arteritis	10	70.5%
Atherosclerosis	7	29.4%
Failing graft	1	1.8%
Patent grafts		
Inflow		
Common femoral artery	11	57.1%
Superficial femoral artery	9	60%
Popliteal artery	6	75%

Discussion:-

Open surgical lower extremity arterial bypass remains the most durable option for infrainguinal revascularization for CLTI. Although increasingly many patients are well served by endovascular therapy, it is still important to be familiar with the available techniques of lower extremity bypass because of its superior patency rates.

In TASC type D lesions, that is, superficial femoral artery (SFA) occlusions or complete popliteal and popliteal trifurcation occlusions, the technical success rate with endovascular approach is less,and hence bypass procedures to tibial,peroneal and pedal vessels can be performed ,which have shown good patency and limb salvage rates.In our study,the primary graft patency and limb salvage rate of the infrapopliteal bypasses were 66% and 94.3% respectively.Our results are comparable with the literature with 1 year patency and limb salvage rate for infrapopliteal bypass as 77% and 85% respectively.

In our study the results ofbypasses with inflow from the SFA and popliteal artery compared favorably with those originating from the common femoral. Benefits of a shorter bypass graft were noted, including greater vein utilization, shorter vein harvest incisions,and avoidance of a groin incision with its associated infection risk.If there is greater than 20% stenosis in SFA or popliteal,or pressure gradient across the lesion is more than 10mmHg,then it can affect the patency rates. The present study extends these conclusions by demonstrating good long-term results with the SFA and popliteal inflow site, with 60% and 75% primary graft patency rates.

Revascularizationin TAO is often not feasible most of the times because of the distributionof diffuse, segmental arterial involvement,poor run off,distal arterial spasm during dissection andpoor-quality veins owing to phlebitis. However, if the patient has CLI and a distal target vessel is present, bypass surgery using autologous vein should be considered.In a study conducted by Dilege and associates the patencyrates at 12, 24, and 36 months were 59.2%,

48%, and 33.3%,respectively and the limb salvage rate was, however, 92.5%.And these results are comparable to ourresults.

Limitations of our study are significant number of patients did not turn up for follow up and hence the sample volume was low.

Conclusion:-

Although the number of infrapopliteal bypass surgeries for critical limb ischemia has decreased in the last few years after the advent of endovascular treatment,it remains the best treatment modality among the all revascularisation procedures for the infra inguinal disease with respect to limb salvage and patency rates.

Infragenicular bypasses that originate from the superficial femoral artery or the popliteal artery can be performed with patency and limb salvage rates comparable to bypasses originating from common femoral artery.

Bypasses can be performed in TAO if there is good outflow and good available conduit,but its patency rate is less when comparable to bypasses performed in atherosclerotic PAD.

Importance offollow up after revascularization procedures should be educated among the patients,because graft surveillance is important to assess and maintain the patency of these procedures.

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