Autogenous Patch Angioplasty With Saphenofemoral Junction As An Additional Benefit Of In Situ Bypass.

Xander Jacobson, MD[1], Elizabeth Pinchman, B.S.[2], Jeffrey C. Hnath, MD[3], R. Clement Darling III, MD[3]

[1]Albany Medical College, Albany Medical Center Department of General Surgery, Albany, NY
[2]Albany Medical College, Albany, NY
[3]Albany Medical Center Department of Vascular Surgery, Albany, NY

ALBANY MEDICAL COLLEGE
ALBANY MED Health System

ALBANY MED Health System

Introduction

- One of the benefits of this in situ bypass for lower extremity ischemia is the ability to use a cuff of the femoral vein at the saphenofemoral junction as a patch angioplasty for the closure of the femoral artery.
- *Objective*: The purpose of this study is to evaluate outcomes for lower extremity in-situ bypass with and without femoral endarterectomy and using the hood of the femoral vein as a patch angioplasty versus a prosthetic patch after endarterectomy.

Methods

- Single academic center vascular group, retrospective study
- 10-year time course, date range: 1/1/2013 – 12/31/2022
- **(1)** In situ bypass without femoral endarterectomy (ISB)
- **(2)** In situ bypass with saphenofemoral junction vein cuff (ISBV) for endarterectomy closure.
- **(3)** In situ bypass with use of patch (ISBP) for endarterectomy closure.
- Data collected included demographics, indication, operative details, and outcomes.
- Groups were compared using standard statistical Chi Square analysis.

Results

- Demographics:
  - 1,750 lower extremity in-situ bypasses were performed, 66% ISB without use of patch or vein cuff, 24.5% with saphenofemoral vein cuff, and 9.5% with patch over endarterectomy closure.
  - ISBP significantly higher burden of CAD & COPD as would be expected compared to other groups.
  - ISBV significantly higher burden of HLD as would be expected compared to other groups.
- Indications:
  - Majority (94.6%) of indications for surgery were claudication (22.0%), rest pain (25.1%), non-healing ulcer (23.8%), gangrene (23.7%).
  - Other indications include aneurysms (2.1%) or thrombosis/embolism (3.3%).
  - No significant difference in indication between groups [χ^2 = 16.9070, p = 0.1531] when adjusted for aneurysms (for which ISBP had a sample size of 0).
- Inflow/Outflow
  - Superficial femoral artery as inflow was significantly higher in ISB vs ISBP/ISBV (p < .0001).
    - Associated with a significantly higher CFA inflow among ISBP/ISBV (p < .0001).
  - Anterior tibial artery as outflow was higher in ISB vs ISBP/ISBV (p = .024).
- Outcomes:
  - Perioperative Mortality similar between groups (p=.699).
  - Readmission rates trended higher in ISBP (p=.052).
  - Post-operative infections were similar (p=.107).
  - Lymphoceles and seromas were significantly higher in ISBP (p=.0013).
  - Early occlusion rates were higher in ISB (p=.037) , but overall revision rates were not significant (p=.082).
  - Major amputation rates were similar among groups (p = .234).
  - Minor amputation rates were higher among ISBP (p = 0.0007).

Demographics	ISB	ISBV	ISBP	Total	Chi Square (χ2)	p
Total	1155 66.00%	429 24.51%	166 9.49%	1750		
Male	791 68.48%	283 65.97%	107 64.46%	1181 67.49%	1.6698	0.4300
Female	364 31.52%	146 34.03%	59 35.54%	569 32.51%		
Diabetes	450 38.96%	178 41.49%	51 30.72%	679 38.80%	5.8825	0.0528
Hypertension	705 61.04%	288 67.13%	103 62.05%	1096 62.63%	4.9896	0.0825
Coronary Artery Disease	315 27.27%	137 31.93%	60 36.14%	512 29.26%	7.4882	0.0237
COPD	133 11.52%	50 11.66%	31 18.67%	214 12.23%	7.1057	0.0286
Hyperlipidemia	601 52.03%	257 59.91%	91 54.82%	949 54.23%	7.8357	0.0199
Chronic Renal Disease	79 6.84%	25 5.83%	14 8.43%	118 6.74%	1.3436	0.5108
Current Smoker	315 27.27%	128 29.84%	48 28.92%	491 28.06%	1.0858	0.5810
Age (mean)	67.2	68.6	66.7	67.5		
Age (range)	22 - 98	44 - 96	40 - 88	22 - 98		

Outcomes	ISB	ISBV	ISBP	Total	Chi Square (χ2)	p
Mortality	16 1.39%	6 1.40%	1 0.60%	23 1.31%	0.7170	0.6987
Readmission (w/in 30 days)	85 7.36%	43 10.02%	20 12.05%	148 8.46%	5.9223	0.0518
Infection Rate	66 5.71%	36 8.39%	8 4.82%	110 6.29%	4.4760	0.1067
Seroma/Lymphocele	26 2.25%	11 2.56%	12 7.23%	49 2.80%	13.3305	**0.0013**
Occlusion	**92 7.97%**	21 4.90%	7 4.22%	120 6.86%	6.6185	**0.0365**
Revision (overall)	90 7.79%	33 7.69%	5 3.01%	128 7.31%	5.0118	0.0816
Total Amputations	65 5.63%	20 4.66%	15 9.04%	100 5.71%	4.2976	0.1166
Major Amputations	51 4.42%	11 2.56%	6 3.61%	68 3.89%	2.9073	0.2337
Minor Amputations	14 1.21%	9 2.10%	9 5.42%	32 1.83%	14.5570	0.0007

Conclusion

- In situ bypass has proven to offer excellent limb salvage and patency rates.
- One of the added benefits is the ability to use a cuff of femoral vein at the saphenofemoral junction as a patch angioplasty after femoral endarterectomy.
- This series demonstrates that the use of the femoral vein cuff as an autogenous patch angioplasty offers equivalent patency and limb salvage outcomes compared to prosthetic patch
- Offer a benefit in terms of lymphatic complications too