Suction Lipectomy of AVF and AVG

PART OF A CATHETER REDUCTION STRATEGY

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Overview of Suction Lipectomy

- **Suction lipectomy**
  - Goal is to superficialize an access which is deep
  - Make the access usable as quickly as possible
  - Expedite catheter removal

- Alternative techniques include:
  - Elevation
  - Transposition
  - Surgical lipectomy
Fistula Elevation Procedures

- Long history of success with experienced operators*
- Challenges:
  - High BMI patients
  - Large incisions
  - Significant time for wound healing

*Fistula Elevation Procedure: Experience with 295 Consecutive Cases During a 7-Year Period
Cathy M. Bronder, DO, David L. Cull, MD, FACS; Email: Spencer G. Kuper, BS, Christopher G. Carsten, MD, FACS; Corey A. Kalbaugh, MS, Anna Cass, MPH, Tina Watkins, MD, Spence M. Taylor, MD, FACS
Journal of the American College of Surgeons
Volume 206, Issue 5, Pages 1076-1081, May 2008
Fistula Transposition

- Dissect out the vein
- Surgically transpose to a more superficial position
- re-anastomose the fistula to the artery

- Invasive Procedure
  - Prone to technical failure
  - Wound healing complications
  - Patients are reluctant
Surgical Lipectomy

Lipectomy as a new approach to secondary procedure superficialization of direct autogenous forearm radial-cephalic arteriovenous accesses for hemodialysis.
Pierre Bourquelot, MD et al.  JVS Volume 50, Issue 2, Pages 369-374.e1, August 2009
N = 49, BMI = 31, Mean depth 8mm → reduced to 3mm
After procedure patients were assessed at 1 month

Accessible autogenous vascular access for hemodialysis in obese individuals using lipectomy.
N = 30, BMI = 40.2, Mean depth 15.8mm → reduced to 4.1mm

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Suction Lipectomy

- Very limited case reports in the literature
- Poorly adopted technique
  - Perception costly special equipment is required
- No data on larger groups of patients
- Dr. Ladenheim study
  - N = 8 patients
  - BMI = 37
  - Mean days to cannulation = 26
Suction Lipectomy

- Can be done on deep tunneled AVG’s

Superficialization of deep arteriovenous access procedures in obese patients using suction-assisted lipectomy: A novel approach.

N = 3, BMI = 45.2, Time to cannulation = 14 days
Suction Lipectomy to Reduce Central Venous Catheter Time

- Observational study
- Primary endpoints
  - Time to cannulation
  - Catheter avoidance / catheter removal
- Inclusion
  - Access matured
  - Prior failed cannulation attempt
- Exclusion
  - High INR
  - Any signs of infection
Results

- N = 30
- Age = 61 (mean)
- BMI = 35.96 kg/m² (mean)
- Access Types
  - 22 brachiocephalic AVF
  - 4 radiocephalic AVF
  - 3 upper arm straight AVG
  - 1 thigh loop graft
Results

- Pre-aspiration depth 12.9mm (range 9.1 - 22mm)
- Post-aspiration depth 4.9mm (range 2 - 8mm)
- Days from initial suction lipectomy to cannulation
  - 12 days (range 1 - 45 days)
- Patients presenting with a deep access and a catheter
  - 12 days to cannulation (mean)
  - 21 days to catheter removal (mean)
- Patients presenting with a deep access, but no back-up catheter
  - 5/6 avoided a catheter to be placed
  - 5 access used within 1 day of suction lipectomy
Equipment

- Tulip Medical [www.tulipmedical.com](http://www.tulipmedical.com)
- Mercedes or Pyramid, SuperLuer hub, 3mm diameter, 15cm length
  - Cost $350 (can be sterilized and reused)
- 5 or 10cc syringe
Technique

- Ultrasound mark access
- Gain access into AVF with a wire and sheath
  - Repair all outflow stenosis
    - Avoid concurrent PTA of lipectomy zone
- 10cc lidocaine with epi (injected around the body of the access)
- Two 0.5cm incisions
  - One on each side of access
  - 2cm inferior and lateral (45° angle)
Technique

- Reciprocating motion with concurrent rotation of the catheter while applying suction
- Removal of fat
  - Above access
  - Both lateral gutters
**Technique**

- Compress while making passes and suctioning with 5 or 10ml syringe
- Hold pressure between passes to prevent hematomas
- Incision closed with interrupted suture
- **POST:**
  - Wrap arm with compression and allow patient to wear 3 days to a week or until intolerable. (Kerlix and Coflex/Cobans)
  - If access needs to be used immediately
    - Additional removal of fat from lateral aspects of AVF is needed
Lipectomy of AVG

- Slightly more work than AVF
- Difficult to work around fibrotic tissue
- Excellent efficacy
  - Successfully salvaged 4 deeply-tunneled AVG’s
Known Complications of superficialization procedures

- Prolonged arm swelling
- Wound infection
- Skin necrosis
Our complications

- 2 moderate hematomas early on
- Prolonged swelling required left subclavian permacath placement, then SVC syndrome
- 7 patients of the 30 patients required 2 liposuction because of initial failure.
- No infections, no skin necrosis
- Antibiotics? Most of the patients did not receive antibiotics for the liposuction procedures. At least 4 of the 30 patients given.
General Findings

- Easier in lighter skinned people with less collagen
- Vigorous tumescent helps (use pump if you have it)
- Standard lengths cannulas come in are 10-15 cm. Special order 7 cm.
- Puncture alongside instead of top of fistula to swivel (get the “gutters”)

Billing

- CPT - 36832 Fistula Revision
  $649.00 Medicare
In Conclusion:

Liposuction of deep arm fistula

- promising area for minimizing surgical intervention and the manipulation of the AVF as is often required with open superficialization.
- Steep learning curve but relatively simple and easy to perform in the outpatient setting
- Adds additional “strength” to your practice
- Part of an overall strategy to avoid catheters and minimize catheter time