TREATMENT OPTIONS FOR CHRONIC VENOUS INSUFFICIENCY

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PREVALENCE OF LOWER LIMB VENOUS DISEASE

• Affects half of adult population.
• 80% have reticular or spider varices
• 30-50% have truncal varicose veins
• 5-10% have skin changes of chronic venous insufficiency (CVI)
• 1% have chronic venous ulcer (CVI)
SYMPTOMATIC VASCULAR DISEASE PREVALENCE

LOWER LIMB VENOUS INSUFFICIENCY

- Very common condition
- Given low priority, both clinically & research
- Lead to significant reductions in health related quality of life (HRQL)
- Adequate treatment especially surgical intervention has been shown to significantly improve quality of life despite high recurrence rate
ONLY AROUND 25% OF POTENTIAL PATIENTS WERE TREATED ADEQUATELY

Symptomatic seeking treatment

1.2M

Saphenous procedures

312K
FLOWCHART FOR CVI

Patient with CVI

Mild disease C1/C2 → Medical Rx sclerotherapy

Moderate/severe disease C2-C6

Duplex ultrasound ± plethysmography

Obstruction

Reflex

Superficial

Saphenous vein ablation ± phlebectomy/sclerotherapy

Superficial + perforator ± deep

Saphenous vein ablation ± phlebectomy + SEPS

Deep

Valvuloplasty

Valve transposition

Valve transplant

PTA + stent Bypass graft

Venography
TREATMENT MODALITY

- Conservative
  Compression stockings/bandage
  Medication: daflon, pentoxyphylline

- Open Surgery
  Ligation & Stripping

- Endovenous Surgery
  EVLA
  RFA
  Foam Sclerotherapy
COMPRESSİON

• 20-30 mmHg compression required
• Class 2 compression stocking
• Below Knee generally adequate
• Only effective when worn
• Require replacement every 6 month
• Lifelong compliance a issue
SURGICAL INTERVENTION

- Patients with VV prefer and get better outcome from surgery than from compression only

- Provides symptomatic relief and significant improvement in quality of life even in patients with uncomplicated varicose veins
SUPERFICIAL VENOUS DISEASE

• Surgical options:
  – Open surgery
  – Endovenous surgery
VEIN LIGATION & STRIPPING: TRADITIONAL STANDARD OF CARE

Procedure:
- Invasive
- Requires general anaesthesia in hospital

Recovery:
- Post-op pain and bruising
- ~2 weeks until back to work
ENDOVENOUS SURGERY

• Involve percutaneous placement of catheter to deliver energy source to create damage to vein wall
• Less morbidity – less pain and bruising post op
• No groin incision – less risk of infection & scarring
• Reduced risk of nerve damage
• Can be done with tumescent anaesthetic alone
ENDOVENOUS SURGERY

• Two main energy source
  – Laser
  – Radio frequency

• Major developments over the last 10 years
• Accepted by vascular surgeons worldwide as first line treatment for varicose veins
• Results comparable to traditional vein ligation & stripping
ENDOVENOUS LASER (EVL)
EVL

- FDA approval 2001 – 70% VV in US treated using laser
- 810 nm laser was the original wavelength used.
- Changes since then:
  - 980nm, 1064nm, 1320nm, 1470nm
  - More durable smaller fibres
  - Radial fibres
EVL

- Marketed by various companies
- Endovenous tumescent anaesthesia under ultrasound guidance technique
- Mechanism:
  - Direct absorption of photon energy
  - Indirectly from steam bubbles and conduction from heated blood
Complications:
- Bruising/haematoma
- Thromboplebitis/cellulitis
- Numbness/nerve damage
- DVT/PE
- Retinal damage
BRUISING POST SURGERY
RADIOFREQUENCY ABLATION (RFA)
RFA

- Marketed by Covidien
- US guided endovenous procedure
- Segmental ablation technology
  - Heating element treats 7cm of vein at once
VEIN MAPPING

• Make indentions in skin using a straw
• Remove ultrasound gel from leg
• Connect marks on the leg with surgical marker to identify pathway of vein and important anatomy
VEIN ACCESS

- Percutaneous access
- Ultrasound guided
- Transverse or longitudinal view

Good access site

Poor access site (multiple collateral veins)
VEIN ACCESS

- Flashback through needle hub and visualization confirms vein access
TUMESCENT INFILTRATION

• Injection into saphenous compartment under ultrasound guidance
  – Observe vein compression around catheter
  – Confirm vein depth $\geq 1\text{cm}$ from skin surface
• Tip position re-confirmed and adjusted as needed after infiltration
CONDUCTIVE HEATING

- Conductive heating is heat transmitted through direct contact
  - Radiofrequency energy used to heat catheter coil
- Vein wall tissue conductively heated to induce collagen contraction and eventual fibrotic sealing of vein
METHOD OF ACTION: COLLAGEN CONTRACTION

• Effect of controlled heating of vein wall:
  • Heat sensitive bonds break at 60°C
  • Molecular structure begins to uncoil
  • Collagen fibers shorten and thicken
  • Vein collagen shrinkage results in obliteration of lumen
  • Results in eventual fibrotic sealing of vessel

Collagen triple helix molecule

Heat

Collagen fibers contract lengthwise and expand in diameter
ACUTE POST-OP SCAN

• Perform acute scan to confirm procedure success
  • Check CFV, SFJ and SEV for patency
  • Document GSV residual lumen
  • Demonstrate occlusion of GSV using colour Doppler
FOLLOW-UP DUPLEX ASSESSMENT

- Periodic follow-up thereafter (e.g. 3 months, 6 months and annually)
  - Variable appearance of treated vein in terms of:
    - Echogenicity
    - Compressibility
RFA TRIAL REPORT

- 5 year result of multicentre European trial – reported at American College of Phebology 12/2012
- Eight centers in Europe from April 2006 to June 2007, enrolled 235 patients to treat 295 lower limbs
- Post op duplex ultrasound imaging and clinical examination at 3 days, 3 months, 6 months, and in yearly intervals up to 5 years
- At 5-year follow-up by Kaplan-Meier analysis, full occlusion of the treated vein observed in 92% of patients (vs 98% at 1 year).
SGH EXPERIENCE

• 20 patients (2012)
• Large VV -> 1cm
• Performed under GA in theatre setting
• Together with multiple avulsions
• LSV completely occluded to 12 months
• All patients satisfied with results & would undertake the procedure again
2 WEEKS POST PROCEDURE
PERFORATOR SURGERY

- US guided perforator ligation
- Subfascial Endoscopic Perforator Surgery (SEPS)
- Open/endovenous
OTHER ENDOVENOUS OPTIONS

- Clarivein
- Venaseal/superglue
- Steam
- Foam slerotherapy
DEEP VENOUS SYSTEM

- Thrombolysis/thrombectomy
- Endovascular venous plasty/stenting
- Valve reconstruction
- Venous bypass surgery
SUMMARY

• Lower limb chronic venous insufficiency is a very common condition.

• Surgical treatment can significantly improve quality of life.

• Endovenous Surgery is as effective as traditional surgery and has less complications.
Thank you ...