Factors influencing the success of endovenous laser ablation

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I have no financial relationships to disclose.

ENDOVENOUS LASER
our experience on 3142 patients from 2002 to 2014

- **2002 - 810 nm laser + bare fiber: 42 pts**
- **2003 - 940 nm laser + bare fiber: 8 pts**
- **2003-2008 - 980 nm laser + bare fiber: 1208 pts**

- **2008 - 1470 nm laser + bare fiber: 174 pts**
- **2008-2014 - 1470 nm laser + radial fiber: 1710 pts**

HISTORICAL BENCHMARK
## Bare fiber and 980 nm laser
(Biolitec AG-Germany) results

- 190 consecutive patients treated between 2003 and 2004 for GSV incompetence and perspectively followed up for 6 years

- **good clinical results** (**88.4%** of pts with disappearance or improvement of symptoms)

- **mediocre duplex results: technical failures 30%**

  -recanalized saphenous trunk: 11.5%

  -reflux on the antero-lateral accessory saphenous vein of the thigh: 7.8%

  -isolated refluxing sapheno-femoral stump: 10.5%

J Vasc Surg Venous Lym Dis 2013,1,20-5

Equipment currently used : 1470 nm laser, radial fibers and ELVeS technique
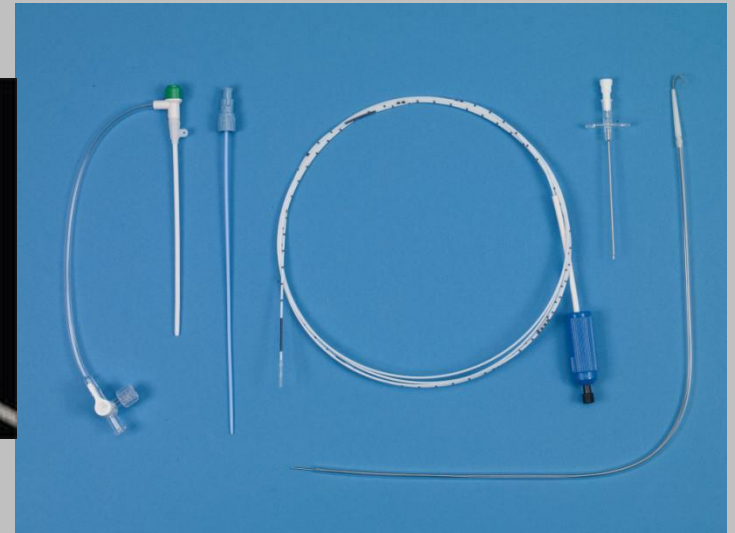
1470 nm laser and radial fibers produce a thermal damage of the vein circumferential, homogeneous, deep, without perforations and contact damage, with marked shrinkage

T Yamamoto et al. JVSVLD 2014
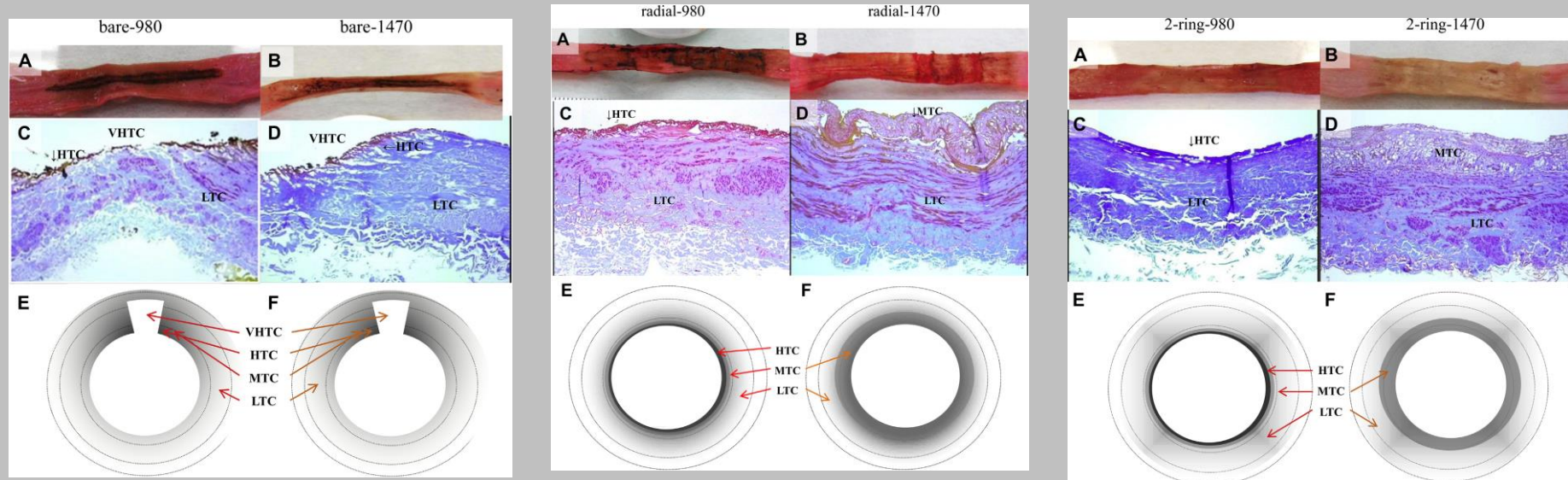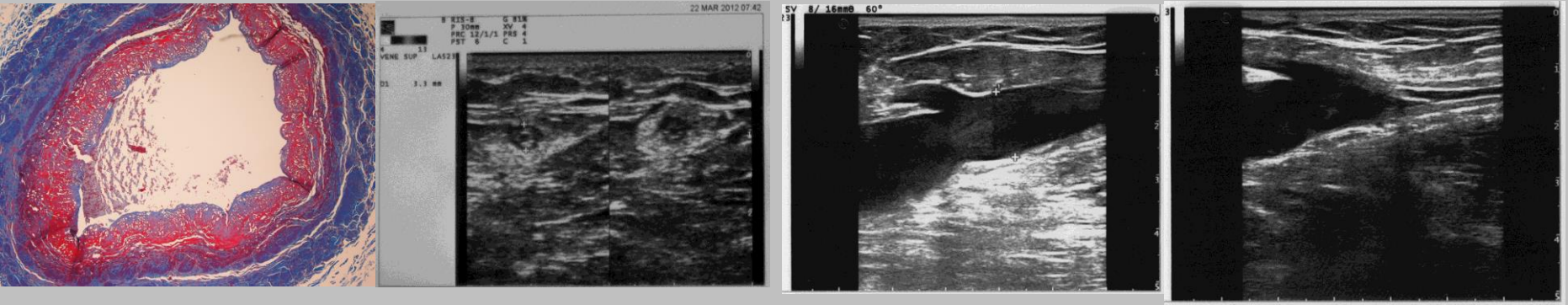
LASER SETTING ENERGY DELIVERED (LEED)

- **Continuous mode**; 5-6 watts with the radial fiber 1ring; **7-10 watts with the radial 2R**
- Energy delivered: Joules/cm according the **rule X 10 on the trunk** and **X 20 at the junction** (LEED=diameter in mm X10 or X20)
- Energy delivered in a in a progressively reduced way from the junction to the access point
- 50 J/cm from the upper third of the leg down for both the great and small saphenous vein

Radial fiber and 1470 nm laser (ELVeS -Biolitec AG) results

- **372 consecutive patients treated between 2008 and 2011, for incompetence of GSV and SSV, perspectively followed up for a mean of 22 months (range 12- 48 m)**

TECHNICAL FAILURES

- **62 SSV treated:** **NO TECHNICAL FAILURES 100% anatomic success: competent SPJ and stump + occlusion of the trunk**

- **310 GSV treated:**

  -**100% anatomic success: occlusion of the trunk**

  -**Technical failures at the junction level :** **12%**

    - **8%** **isolated refluxing stumps**
    - 3% refluxing stumps + reflux in AASV-APSV

  -**Clinical failures** **(2 pts-3 limbs)** **1%**

Isolated refluxing saphenous femoral stump: 8%

- **For many users, this finding is rare, as the reflux in the stump or is not sought or is investigated with a not suitable manoeuver (manual compression/relaxation of the calf)**

- **For other users, this finding is considered normal or "quasi" normal**

- **Clinical significance and risk for recurrence: not relevant in the medium term; unknown in the long / very long term**

Reduction of technical failures vs historical benchmark:
12% vs 30%

- no recanalization of the saphenous trunk:
  0% vs 11.5%

  no neovascularization below the refluxing stumps at the SFJ

- reduced by half the reflux on the antero-lateral accessory saphenous vein:
  3% vs 7.8%

- reduced the percentage of isolated refluxing saphenous femoral stump: **8%** vs 10.5%

Factors that influence the success on the trunk: 100% occlusion of the GSV and SSV

- **Success factors:**
  - **-type of thermal damage / use of radial fibers and 1470nm laser**
  - **-amount of energy delivered based on the average size of the vein (rule of X10)**
  - -continuous mode of energy delivery
  - -tumescent anesthesia

- **No risk factors for failure**

Factors that reduce the technical failures at the sapheno-femoral junction

- **Success factors:**
  -type of thermal damage

  -amount of energy delivered based on the caliber of the junction and the rule of X 20

  -marked and immediate shrinkage at the junction
  - large amount of tumescent anesthesia/ecoguided compression of the fiber tip

  -placement of the fiber tip between 1 and 2 cm from the junction or below the origin of the AASV

- **Risk factors for failure:**
  Diameter of the junction = /> 9mm and C class of CEAP = /> 4