



GPCME Laser session Rotorua 2010

Vascular Uses of Medical Lasers

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Disclosure

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No commercial sponsorship

Vascular Targets

DIRECT:

- ▶ Venules
- ▶ Capillaries
- ▶ Varicose veins
- ▶ Vascular malformations

AUGMENTED:

- ▶ Photodynamic therapy – various sources

Depth of targets

- ▶ Cutaneous
- ▶ Subcutaneous
- ▶ Deep compartmental – endovascular effective

Clinical Applications

Capillary malformation

Telangiectasia : Rosacea , Actinic, GET

Diffuse erythemas : Rosacea, Poikiloderma, KP rubra

Spider angiomas

Malformations : VM, AVM, LM, Mixed

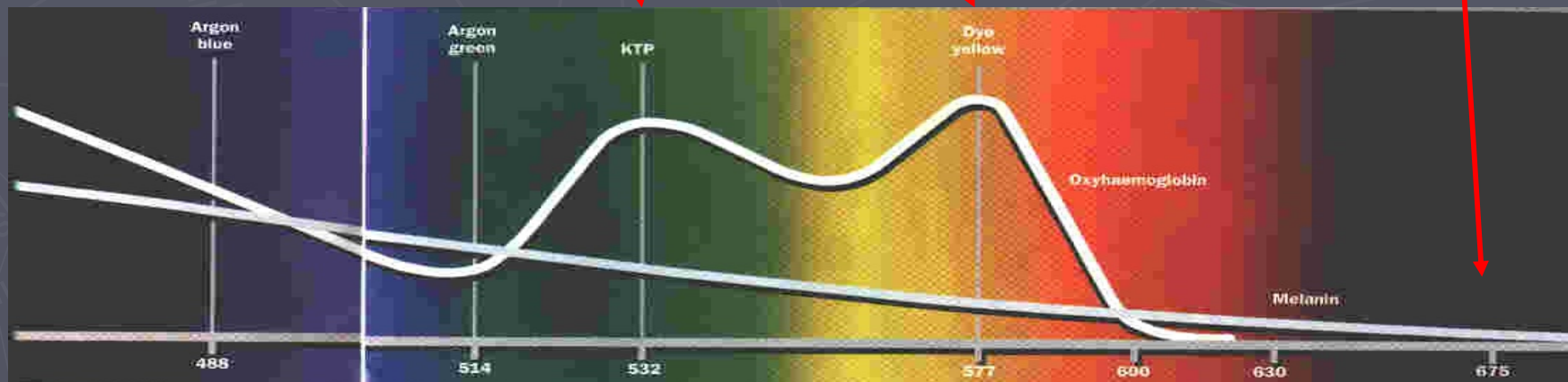
Campbell de Morgan spots

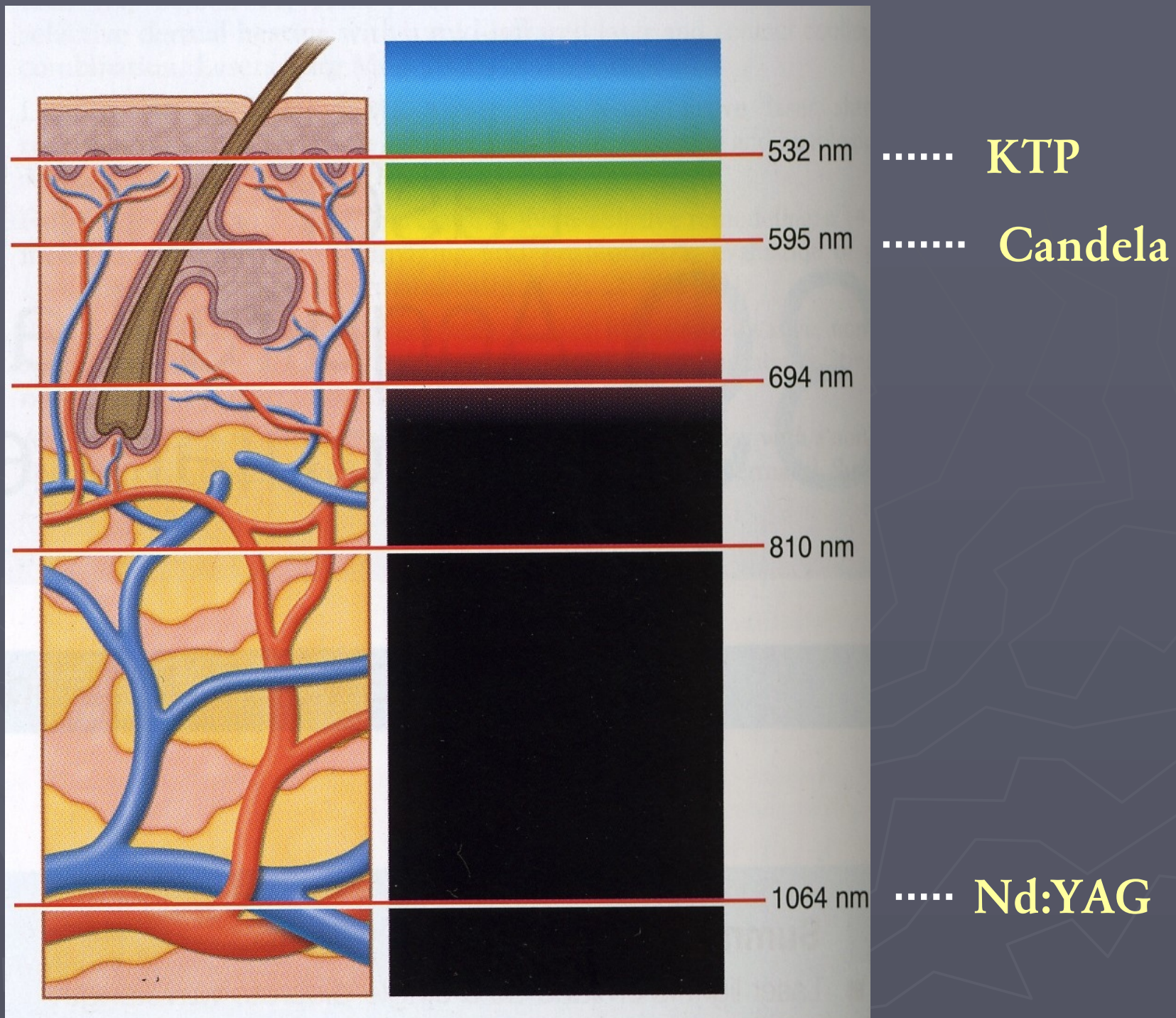
Varicose veins

Vascular Lasers - Wavelength factors

Usual wavelengths
between 530-600nm

Occasionally
wavelengths
800-1064nm

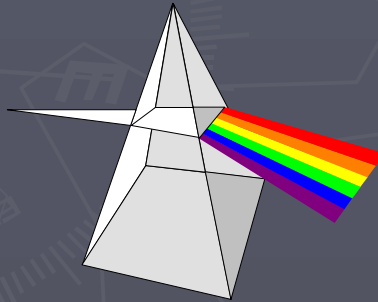




Vascular Lasers – What's New ?

Chromophore v collateral damage:

- Better cooling devices
- Higher power lasers
- Larger spot sizes
- Longer pulse durations



Vascular Lasers

- Argon , copper vapour, copper bromide, krypton, KTP lasers
- Wavelength range 488 – 638nm
- Non-specific thermal injury

Adverse Effects

SEs:

- Pain
- Pigment changes
- Blistering
- Scarring
- Swelling
- Erythema



Gemini vascular laser

532nm – 1064 nm



IPL = Intense Pulsed Light

- ▶ Non coherent light source
- ▶ Cheaper
- ▶ Non specific
- ▶ Riskier darker skin types
- ▶ Widely used , often nonmedical (HR)
- ▶ Filtered minimum wavelength
- ▶ All wavelengths above this transmitted
- ▶ Useful for rosacea, PDT, CDMs, spider naevi, angiomata

Facial Telangiectasiae



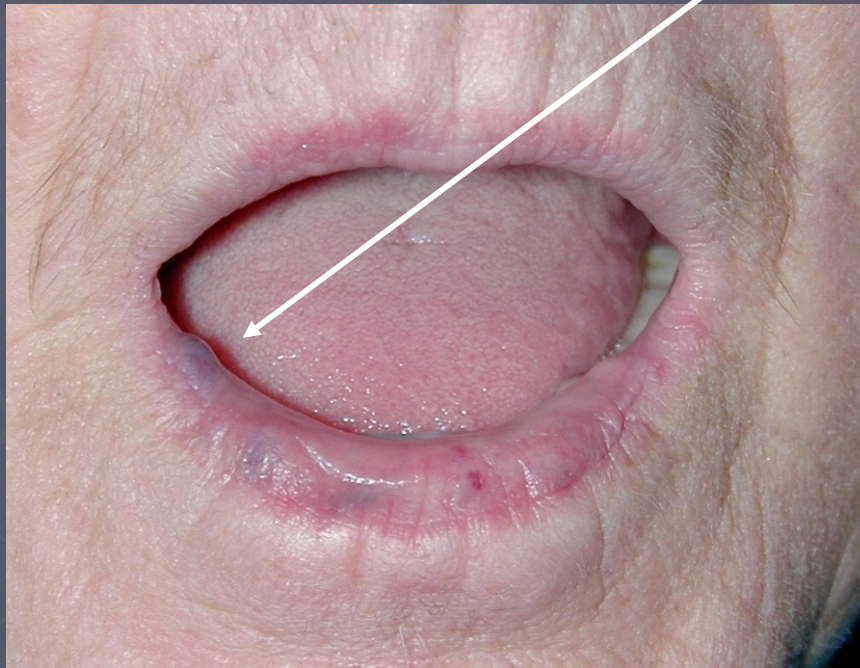
Facial red veins.



532/1064nm large spot vascular treatment



Blue lesions - venous lake



Post Gemini
Nd:YAG 1064nm





Venous malformation - Nd:YAG 1064nm

Leg Veins Lasers

- **External** – 1064nm (NdYAG) painful - poor
 - Shorter wavelengths for GET, matting
- **Endovascular (EVLA)**
 - 810nm
 - 940, 980nm
 - 1320nm
 - 1470nm
 - 1500nm

Varicose Veins - Endovascular Lasers

- immediate thermal occlusion.
- 810nm - 1500nm.
- Diodes less power
- Class 4 lasers – infrared preferable
- Plant and staff costs
- Safe, popular, effective
- Tumescant local anaesthesia
- Combined with foam sclerotherapy
- 1st line RX most western countries 10years

Endovenous Laser Ablation – 1320nm

- ▶ Intra/extra fascial veins
- ▶ > 2 mm diameter
- ▶ Patient friendly
- ▶ Effective and safe

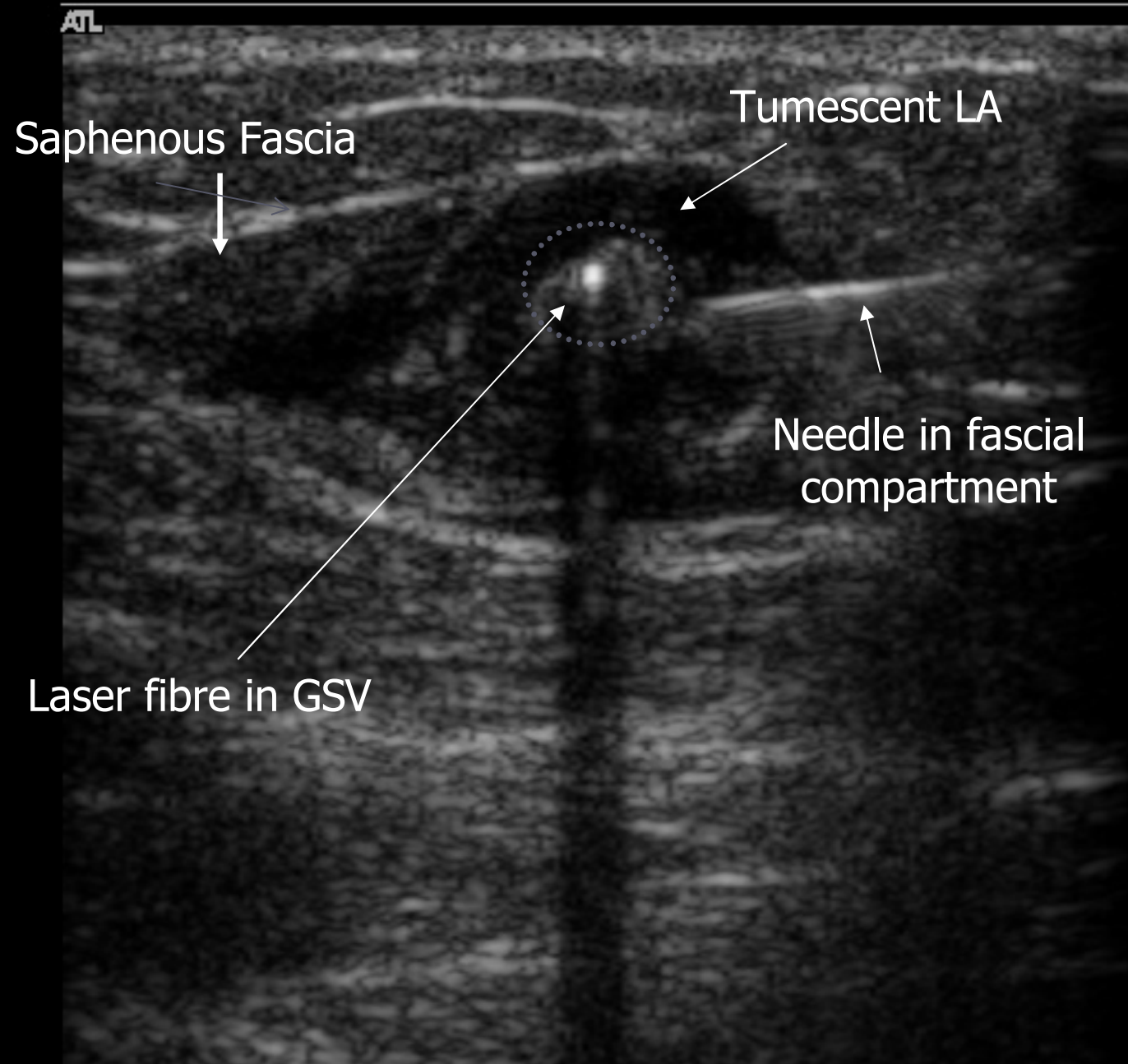




Varicose Veins

- post EVLA at 3 years





Varicose Ulcers - Rx the underlying cause, venous HT



3 months after EVLA →

Laser Treatment of Leg Veins

Leg veins (cf. facial telangiectasia):

- Increased hydrostatic pressure
- Deeper
- Thicker adventitia and basal lamina
- Harder to treat



Spider leg veins

- possible, slow and it hurts!



1064nm, 1.5mm, 60msec,
660J/cm²

Sclerotherapy better



Laser Selection for leg veins

- ▶ **Spider telangiectasia:** 500-600nm (KTP, PDL)
- ▶ **Blue venule ectasia, reticular veins <4mm:**
800 to 1100nm (Diode lasers and Nd:YAG)
- ▶ **Larger diameter vessels** require longer pulse duration to cause sufficient damage of luminal wall

Vascular Lasers - new concepts

Combined wavelength machines

- ✓ Multiple wavelength platforms
- ✓ 1064nm for deeper vascular lesions

Multi-platform machines

- Gemini (Laserscope) - 532nm, 1064nm
- Cynergy (Cynosure) - 585nm, 1064nm, IPL
- Harmony (Alma) - Multiple IPL and lasers heads

Single platform, multi head

Harmony (Alma), Starlux(Palomar), Lumenis one

- Application heads :-
 - IPL
 - UVL
 - RF
 - Lasers
 - 532nm Q switched
 - 1064nm (Long pulsed & Q switched)
 - 2934nm Erbium (broad & fractionated)
 - 1320nm (broad & fractionated)



Cutaneous chromophores

(light absorbing structures)

- Major skin chromophores
 - ✓ Haemoglobin
 - ✓ Water
 - ✓ Melanin
- Unique absorption spectra

Pulsed Lasers

- ▶ Pulsed dye lasers (Candela V beam - 595nm)
- ▶ KTP 532nm (Aura, Gemini, Versapulse)
- ▶ Nd:YAG 1064nm (Gemini, Coolglide)
- ▶ Diodes lasers - 800 to 940nm

Capillary Malformation

Port wine stain



Candela V beam, 6 Rx's

Capillary Malformation



Klippel-Trenaunay syndrome





KTP laser, 1 treatment

Actinic Telangiectasia



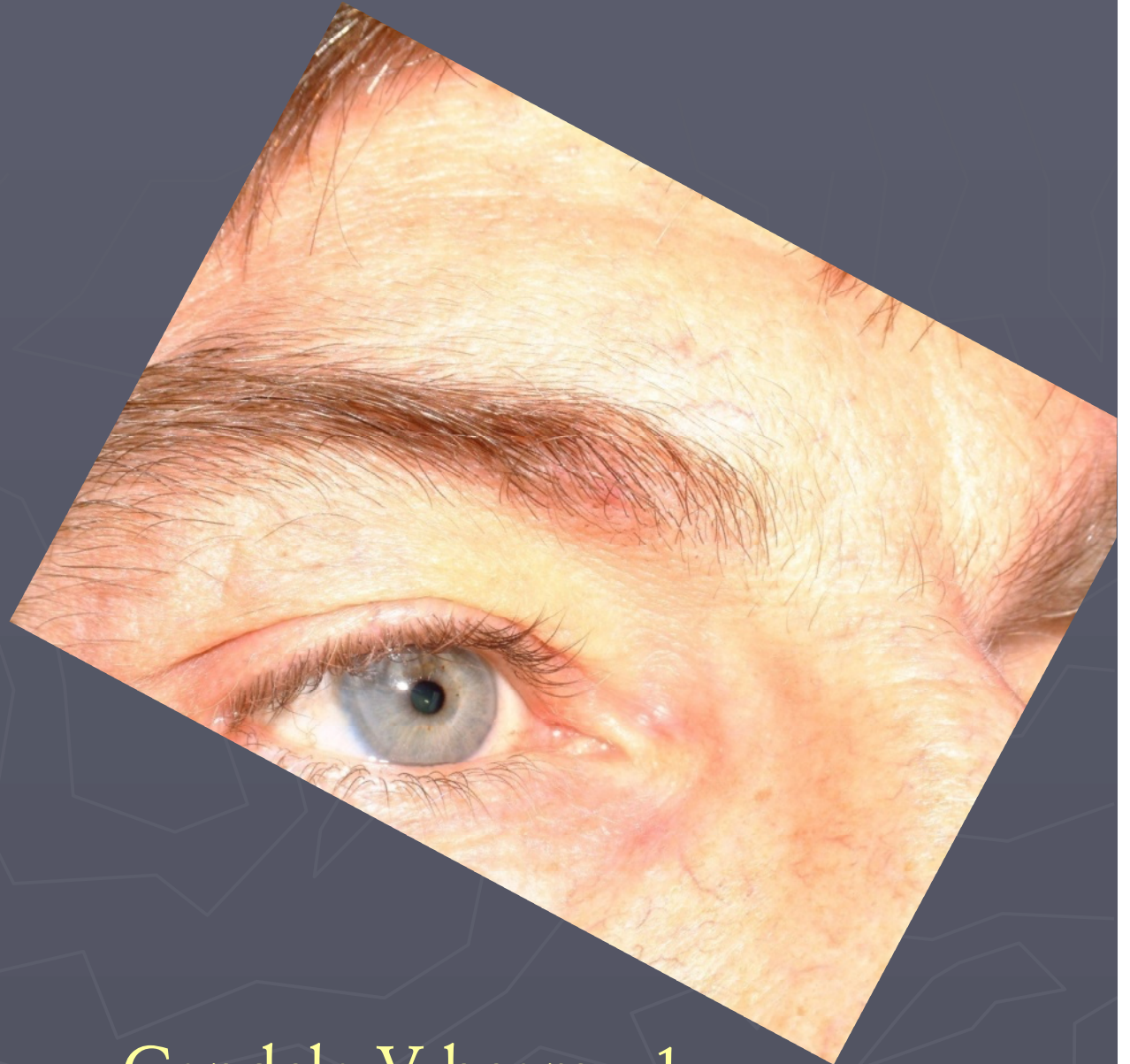
Candela Vbeam x2

Generalised essential telangiectasia



Candela Vbeam x1

Angiomas



Candela V beam x1

Keratosis pilaris rubra



Poikiloderma of Civatte



Venous Malformations

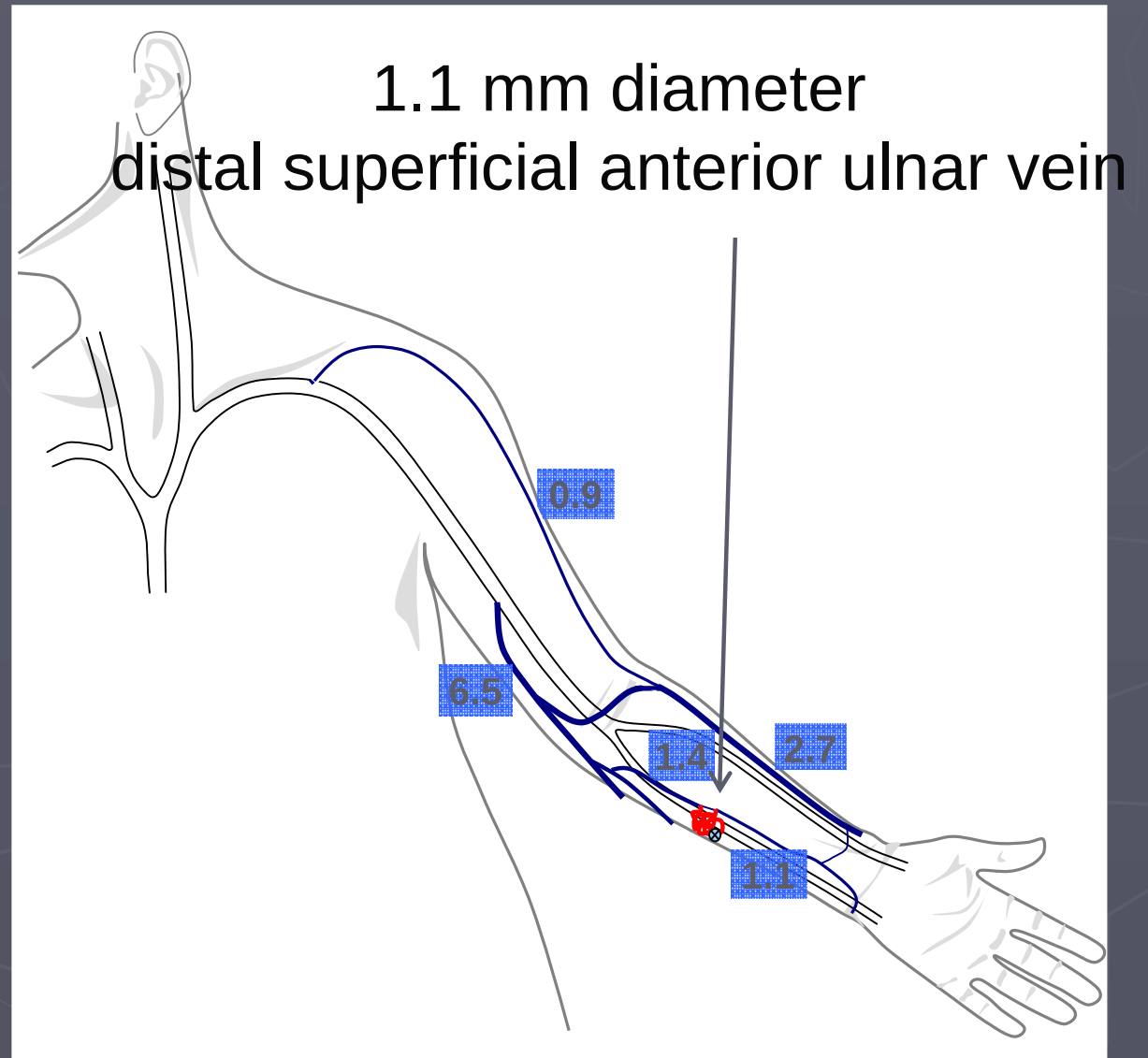
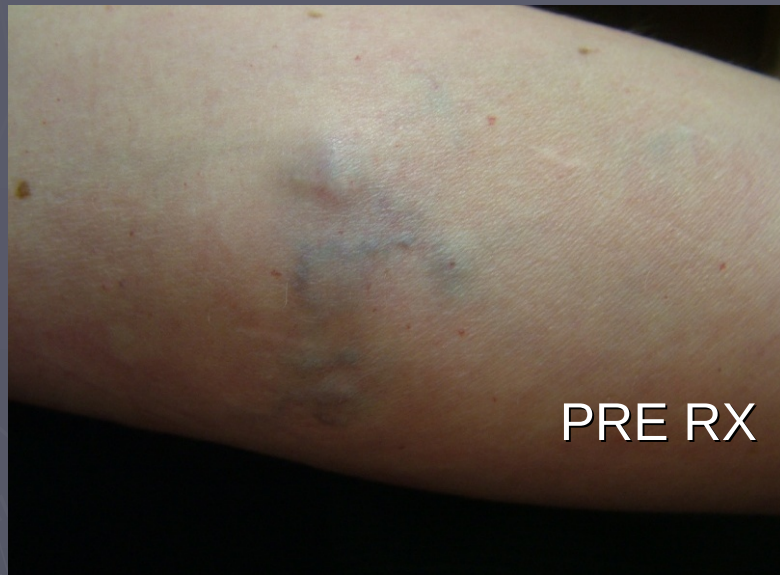


Nd:YAG 1064nm, 5mm, 80msec, x1



Venous malformation - Nd:YAG 1064nm

VM Arm, EVLA



VM – vein access



Tumescent anaesthesia



FU VM at 6 weeks



Angiokeratoma



Nd:YAG 1064nm x1 Rx



Vascular Laser - Side Effects

- Pain
- Erythema
- Swelling
- Purpura
- Pigmentation change
- Scarring
- Operator dependent

Issues

- ▶ Cost – Gemini AUD \$200K
- ▶ Staff training
- ▶ Safe premises – fire, ocular hazards, for patients and staff
- ▶ Repeated RXs may be necessary
- ▶ Can augment (PDT)
- ▶ Lack of scarring
- ▶ PIHP darker skin types

Elegant and Modern



July 16 1969



Thanks

