Post-procedure pain, safety and efficacy following great saphenous (GSV) endovenous laser ablation (EVLA) using a 1470nm diode laser

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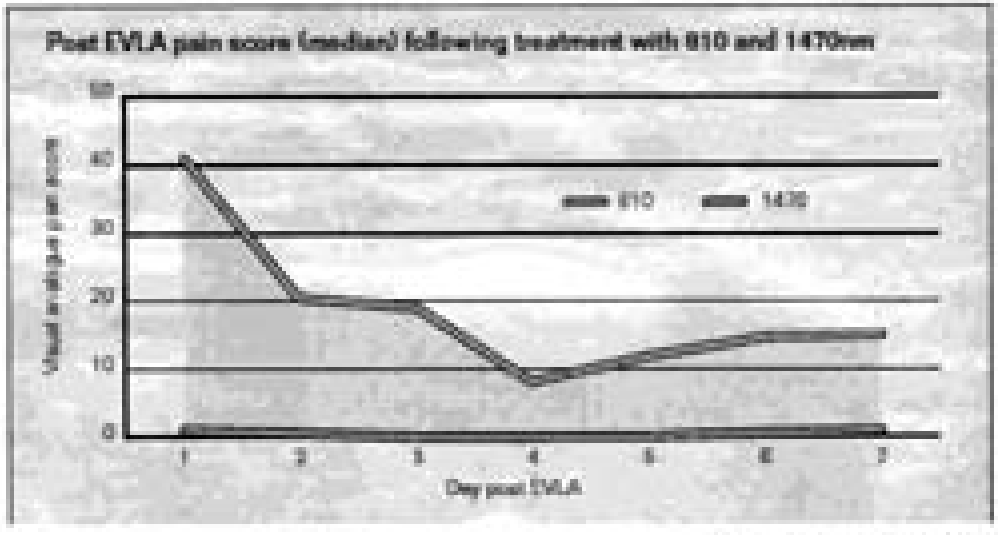

Figure 1: Pain score post EVLA

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Endovenous laser ablation (EVLA) is a promising minimally invasive treatment with recent studies confirming short term results comparable to surgery.

It is a safe procedure and serious complications are rare. However a significant number of patients experience post-procedure pain and bruising with phlebitis occurring in up to 30%.[1]

Although the technique and components of procedure are becoming standardised, there is considerable variation in the laser wavelengths used. There are few studies comparing wavelengths however, those published indicate there may be less bruising and a lower requirement for analgesia in those treated with longer wavelengths.[2,3]

A possible explanation for the improved results is related to the absorbance profile of haemoglobin and intra cellular water. The wavelength of the current generation of laser (810–980nm) mainly target haemoglobin whereas longer wavelengths are absorbed up to forty-fold more by water, potentially producing greater tissue perforation.

The aim of this study was to ascertain whether laser wavelength influenced outcome post EVLA for truncal vein incompetence.

Methods

A prospective study was performed in patients with primary varicose veins secondary to great saphenous vein reflux. Those suitable for EVLA underwent consultant led treatment using either an 810 (Group A) or 1470nm (Group B) continuous diode laser. In our patients, under local anaesthetic, the GSV was cannulated under ultrasound guidance. The guide wire was placed and the catheter tip advanced to within 1–2cm of the sapheno-femoral junction. All patients received tumescent anaesthesia. The laser fibre was then inserted into the catheter and slowly withdrawn, delivering continuous laser energy at a rate of 2mm/sec, aiming to deliver a minimum of 60J/cm.

Upon completion a foam sponge was positioned over the vein and compression bandage applied for one week followed by a further week of compression stockings. During the first week patients completed 100mm visual analogue scale for pain assessment on a daily basis.

At six weeks post-procedure patients were clinically examined for evidence of complications and underwent ultrasound scanning at that point and a further scan at three months in order to identify abolition of GSV reflux.

The primary end points were therefore pain score and GSV occlusion. Statistical analysis was performed using SPSS version 16.0.0 (Statistical package for Social Sciences Inc, Chicago, Illinois, USA). A p value ≤ 0.05 was considered statistically significant.

Results

Forty-nine patients were included in the study with two patients having received bilateral treatments.

There were more women in the study but there was no significant male female ratio difference between the two groups ($p=0.378$ Chi square test).

The median age was 53 and patients treated had a CEAP score between two and five.

Both groups received median laser energy of 75J/cm. Group B had a 100% occlusion rate whilst in group A there was one failure to cannulate the GSV and two patients had a partially occluded GSV resulting in a 90% occlusion rate.

Two patients in group A suffered transient saphenous paraesthesia and a further three had phlebitis. There were no complications in group B.

Significantly lower pain scores were reported by patients treated with 1470nm (Figure 1).

Conclusion

The results of this study confirm previous anecdotal reports that longer wavelength lasers are associated with less post-procedural pain than those currently used for EVLA.

Furthermore there were no complications in the 1470 group confirming its safety and all veins were successfully occluded.

These results would be consistent with the hypothesis that the energy from the longer wavelength laser specifically targets the vein wall rather than causing thrombotic occlusion superimposed on irreversible vessel damage.

A randomised control trial is being developed in order to confirm these apparent benefits.

References

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