The management of varicose vein disease has witnessed a dramatic transformation over the past decade. Surgery for this common condition, long considered the ‘gold-standard’ treatment, has gradually been replaced by endothermal ablation and ultrasound-guided foam sclerotherapy (UGFS). These minimally invasive techniques have allowed a more rapid improvement in patients’ quality of life and return to normal activities. The focus on enhancing patients’ experience even further has led to the introduction of newer, non-thermal, non-tumescent (NTNT) technologies. These completely obviate the need for uncomfortable thermal ablation and tumescent infiltration with possibly a similar level of efficacy as radiofrequency ablation (RFA) and endovenous laser ablation (EVLA) in the short term¹.

The next potential area where a substantial difference in the management of varicose veins can be made is the use of compression therapy following endovenous ablation. It is widely believed that compression reduces post-operative swelling, haematoma formation and pain following surgery for varicose veins, but no irrefutable evidence exists². Edwards et al. (2009) surveyed the members of the Vascular Society of Great Britain and Ireland and found that 75% used either elastic or non-elastic bandages post-operatively, with 77% changing to compression stockings afterwards³. There was a high variability with respect to the length of time the bandages and stockings were worn for. Another questionnaire survey of the members of the same society demonstrated that following endothermal ablation, 87% of responders stated that they used compression stockings and 60% used bandages⁴. Similar numbers used compression stockings and bandages after foam sclerotherapy. Once again, however, there was marked inconsistency in the length of time these were prescribed for.
Bakker et al. (2013) carried out a randomised controlled trial looking at the use of compression stockings for 2 days compared to 7 days following EVLA of the great saphenous vein (GSV). At one week, the physical function, vitality and pain score was significantly better in the 7-day compression group. By 6 weeks though, there were no major differences between the two groups.

Elderman and his colleagues (2014) also looked at the effect of compression stockings post-EVLA of the GSV. Patients were randomised to receiving either compression stockings or no stockings. Those in the no compression group had significantly worse pain scores up to 7 days and used analgesia more frequently than the group randomised to compression.

These two studies appear to indicate a benefit in the short-term of compression therapy in patients undergoing endovenous laser ablation, but are limited by the considerable drop-outs in both studies (40 patients of the original 109 approached in the Bakker et al. study and 32 patients from Elderman et al. trial).

The role of compression therapy following UGFS has also been investigated. Hamel-Desnos et al. (2010) conducted a randomised study looking at the use of compression stockings post-foam sclerotherapy. Class 2 compression stockings (pressure exerted: 15-20mmHg) were used. No significant differences were found in the pain scores, inflammation, ecchymosis, induration, pigmentation or matting at 14 and 28 days. Compliance was an issue with only 40% of patients wearing compression stockings everyday. Due to the relatively small sample size (60 patients in total) the study may not have been powered sufficiently to enable detection of a significant difference between the groups.

O'Hare et al. (2010) evaluated the use of compression bandaging for 1 day and 5 days in patients having UGFS followed by TED stockings for 2 weeks. At the 6-week point, no significant differences were noted in the pain scores, varicose vein severity score or rate of vein occlusion between the two groups.

The use of compression post-non-thermal ablation has recently joined this debate. Cyanoacrylate adhesive injection, one of the NTNT, is routinely utilised with only a simple bandage applied to the puncture site. Almeida et al. (2013), the original proponents of this deviation from usual varicose vein practice, suggested that compression was not required since the vein wall was not perforated during the
ablative procedure\textsuperscript{8}. On the other hand, mechanochemical ablation, which causes only intimal injury and also does not puncture the vein, continues to be used with compression stockings\textsuperscript{11-13}.

Studies investigating the role of compression following varicose vein treatment demonstrate a large amount of variability with respect to the type of compression used with some reporting both compression stockings and bandages usage\textsuperscript{6, 14, 15}. An applied pressure at the thigh of greater than 10-15mmHg in the lying position and 40-50mmHg in the standing position is said to be needed to occlude a traumatised vein\textsuperscript{16}. Compression with inelastic bandages exert a pressure greater than 50mmHg at the thigh level while elastic stockings apply a pressure of only a few mmHg at the thigh level\textsuperscript{16}. In their study, Hamel-Desnos et al. used class 2 compression stockings with pressures of 15-20mmHg, which would have been inadequate to occlude the veins in the standing position\textsuperscript{6}. Lugli et al. (2009), for their part, used a novel cross-taped technique to exert eccentric compression onto the great saphenous vein following EVLA\textsuperscript{15}. This effect was confirmed on computed tomography (CT) scanning, showing that the eccentric compression pressed the thigh tissues deeper than with compression stockings. The results showed that the pain scores were significantly less in those receiving the cross-taped compression compared to the control group\textsuperscript{15}.

Other inconsistencies often noted in trials have been with respect to the duration of compression and the different methods of compression was applied for. O’Hare et al. looked at the use of compression bandages, but after day 1 and day 5, the compression was changed to TED stockings for 2 weeks\textsuperscript{7}. This makes it very difficult to determine whether the effects reported at the end of the study was due to the stockings or the bandages.

The above studies illustrate the problem faced when looking at compression in patients undergoing endovenous ablation. There is extensive heterogeneity with some trials demonstrating a clear benefit and others being inconclusive. This was again highlighted in a recent systematic review which found that the evidence available is inadequate to produce guidelines\textsuperscript{17}. Indeed, the authors found that the articles were often let down by a number of flaws, most notably, by insufficient number of patients, different compression regimens and variable duration of compression application (0-7 days considered as ‘short’ duration and 5-42 days considered as ‘long’ duration)\textsuperscript{17}. 
The 2013 National Institute for Health and Clinical Excellence (NICE) Guidelines on varicose veins are unable to provide guidance either, other than to state a limit on the number of days compression bandaging, or hosiery, is prescribed for, when offered\(^{18}\). NICE appears to be aware of the deficiencies in the available evidence and has recommended further research into the clinical effects and cost-effectiveness of compression following varicose vein intervention as well as the duration of any therapy.

Ultimately, an answer addressing the role of compression after varicose vein intervention would allow us to improve the management we currently offer even further. This pursuit is, however, strongly hampered by an obvious lack of evidence. Well-conducted randomised controlled studies with, crucially, adequately powered sample sizes are urgently needed to try resolve this problem\(^{19, 20}\).

References: