Mini Review

Can Foam Sclerotherapy with High Ligation Prevent Extension of Venous Reflux With Time?

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Abstract

Modern management of CVI includes treatment of the cause (reflux) and result (varicose veins). Generally, the elimination of reflux has been accomplished with surgery. The new thermal ablation techniques such as endovenous laser ablation therapy (EVLT) and radiofrequency (RF) ablation have the advantage of being performed with only local anesthesia, but they have the potential for residual saphenofemoral reflux due to incomplete ablation of all side branches of the saphenofemoral junction (SFJ). Results of our past experiments over 12 years showed the safety and effectivity of ligation + foam sclerotherapy as an alternative technique making possible daily surgery are not different than those of classic stripping.

ABBREVIATIONS

CVI: Chronic venous insufficiency

REVIEW LITERATURE

In the treatment of chronic venous insufficiency (CVI) high ligation (HL) and stripping of the saphenous varicose veins and percutaneous phlebectomy have been the main options for many years. Modern management of CVI includes treatment of the cause (reflux) and result (varicose veins). Reflux should be treated before varicosities because if the cause is not eliminated, the varicose veins will recur [1]. Generally, the elimination of reflux has been accomplished with surgery. The new thermal ablation techniques such as endovenous laser ablation therapy (EVLT) and radiofrequency (RF) ablation have the advantage of being performed with only local anesthesia, but they have the potential for residual saphenofemoral reflux due to incomplete ablation of all side branches of the saphenofemoral junction (SFJ) [1]. These techniques can obliterate only the main trunk of the saphenous vein, and complete disconnection of all of the side branches draining to the SFJ is never accomplished. Classical surgical HL has also been shown to lead to recurrent varicose vein development due to neovascularization, but this is not completely true; real neovascularization demonstrated by Doppler is rare and is mostly related to the SFJ and side branches not being divided properly. Thus, the primary cause of varicose vein recurrence after surgery is inadequate surgical technique, and neovascularization is never the only cause of recurrence [2]. It also has an incidence of 7.1% after EVLT and 2.2% after RF ablation. The development of arteriovenous fistulae and the intensity of the inflammatory response might be responsible for recanalization of ablated venous segments. This effect is due entirely to inadequate SFJ or side branch division in the initial procedure [1,2]. In support of the importance of complete SFJ ligation, small vessel networks and GSV recanalization at the SFJ have more commonly been found in patients undergoing RF ablation without ligation (46%) than RF ablation with ligation (14%) [3]. In a systematic review comparing recurrence rates, overall complication rates, and symptom relief, it was found that surgery was not inferior to endovenous procedures. Our past experience and results of previous studies comparing the results of three different surgical techniques (complete stripping with HL, partial above-knee stripping with HL, and HL alone) have shown that the best recurrence rate, best improvement in CEAP class, and best event-free survival rates are achieved using complete stripping with HL [4]. The rate of residual reflux and recurrence after partial stripping can reach up to 20%, and this complication is found more often with patent below knee saphenous veins than with incompetent perforatory veins (IPVs) undetected preoperatively. Given that these techniques are theoretically equivalent to stripping with low ligation of the proximal saphenous vein, it is not wise or completely true to claim that their recurrence rates and effectiveness are better than those of complete stripping with HL. Past experiments have shown that, for HL with complete division of the SFJ and all side branches, full-length obliteration of the saphenous vein for insufficiency was necessary to prevent recurrence [4]. An incompetent SFJ, an incompetent SSV, IPVs, an incompetent superficial vessel in the thigh, HL without stripping, female sex, and post-thrombotic DVI were all associated with greater risk of recurrence after a technically correct surgery [5].

Our study on 372 patients showed that preoperative CEAP class, bilateral limb disease, occupation, family history or genetic predisposition, prior DVT (post-thrombotic etiology of varices), older age, and preoperative IPVs were predictors of early postoperative and later clinical status, outcome, and other events. The predictors of postoperative symptom recurrence and clinical and Doppler examination findings depend mostly on the preoperative characteristics of individual patients and varicose vein surgery can prevent extension of venous reflux with 5-year symptom-free survival rate of 51 ± 0.8% [6]. We continued to recruit patients till today for this study and now it included 2577 and 3563 patients who had undergone classic stripping and foam sclerotherapy, respectively, within the previous 12 years (May 2005-May 2017). We included all patients without depending on saphenous vein diameter (up to 2 cm) for foam sclerotherapy group also. Preoperative and postoperative CEAP class, symptoms, recurrence, and Doppler findings of the two groups were compared. 6140 patients, who had undergone classic stripping and foam sclerotherapy + ligation, Stripping group included 2577 (42%) patients, foam+ligation group included 3563 (58%) patients. The technique of operation has no significant effect on postoperative symptom recurrence, CEAP class, and Doppler findings. There is no significant difference on postoperative effectiveness between foam sclerotherapy and stripping (Figure 1, 2). Relative to other endovascular techniques such as laser and RF ablation, the use of foam sclerotherapy is significantly more cost effective. There is no significant difference in clinical important outcomes between ultrasound-guided foam sclerotherapy and endothermal ablation. As ultrasound-guided foam sclerotherapy is less expensive, it is likely to be a more cost-effective option in most patients in most healthcare settings [7]. Besides the ease of application, less postoperative discomfort and more patient satisfaction, a recent prospective study showed that although standard stripping of the GSV and invagination stripping were not associated with major discomfort and problems in the early postoperative period, SFJ ligation and GSV reverse foam sclerotherapy yielded better patient satisfaction with less postoperative bruising and discomfort and reduced analgesic requirements [8]. Classical stripping with HL has some disadvantages, such as the need for preoperative or postoperative hospitalization, general or spinal anesthesia, bleeding, and nerve damage complications which all can be harmful for older patients [6,8]. However, foam sclerotherapy with HL never needs general or spinal anesthesia therefore the potential complications or hazardous effects of such invasive procedures are avoided with considerably reduced bleeding and nerve damage complications; it can be used safely in older patients or patients whose conditions are not available for anesthesia. This technique can provide the complete division of the SFJ and side branches which is not possible with EVLT or RF. It can also minimize the varicose proliferations origined from this level by providing the sclerozing of the below-knee saphenous vein. In conclusion, not only it has potential to get ideal long-term follow-up results of surgical stripping, but also it can make possible to get ideal cosmetic, postoperative comfort, and minimum complication rates of other non-invasive procedures [6]. The safety and effectivity of ligation + foam sclerotherapy as an alternative technique making possible daily surgery are not different than those of classic stripping.

Figure 1 Comparative event-free survival rates: The 5-year symptom-free survival rates were 52% ± 0.6% and 47% ± 0.3% in the foam sclerotherapy and stripping groups, respectively, and there was no significant difference between stripping and foam+ligation groups (Cox regression analysis: p = 0.692, risk ratio = 1.127, 95% confidence limits = 0.514 – 0.258).

Figure 2 Actuarial event-free survival rate for all patients: symptom-free survival in 5 years, Kaplan-Meier analysis: %46.3 ± 0.70.

REFERENCES
4. Dwerryhouse S, Davies B, Harradine K, Earnshaw J]. Stripping the long


