

The Lazarus Syndrome

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Aim. In the last 10 years the endovascular procedures have taken over on saphenous stripping in rich countries. The recent literature is full of scientific papers that magnify the results of endovascular procedures and guidelines in many countries attribute to them the role of a new golden standard in the treatment of varicose disease. But surely in the world there are still some surgeons who perform the technique of saphenous stripping, in patients in which the indication is placed after preoperative ultrasound analysis. Therefore stripping is not dead and cannot be buried still.

Methods. In our experience the traditional ablative surgery in the treatment of patients with varicose veins of the lower limbs (CEAP 2-6) is always at the first place and continues to be performed in a percentage that approaches 70% compared to the total of phlebological interventions performed annually. Over the past 3 years on a total of 858 patients (554 F and 304 M) aged between 22 and 84 years, 590 patients (68.7%) underwent saphenectomy by stripping, often associated with multiple phlebectomies of the thigh and/or leg.

Results. With the various techniques used there was neither mortality, nor infectious complications. We complain about a case of hematoma in the thigh in a subject operated by stripping in anticoagulant treatment, because of serious heart disease. No thrombotic complication, neither immediate nor at 3-month follow-up, has been documented.

Conclusion. Our current experience makes us conclude that surgery still represents for long-term efficacy the therapeutic strategy of reference, but it is undeniable that the endovascular procedures for their minimally invasiveness, fewer complications, reduced need for general anesthesia, quicker return to work and equivalent recurrence rates, are destined to become in the near future the gold standard for treatment of varicose disease. However, due to the heterogeneity of the diseases, it is not possible to perform only one type of operation for all varicose patients, and probably saphenous stripping will always have a role, though reduced over time.

KEY WORDS: Veins - Vascular surgical procedures - Saphenous vein, surgery.

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In the last 10 years the endovascular procedures in more advanced and richer countries have definitely taken the upper hand on saphenous stripping, that was considered in the last century the golden standard for the treatment of varicose disease. But we are really sure that the traditional ablative surgery is definitely outdated, not to say dead and buried.

The recent literature is full of scientific papers^{1,2} that praise the results of endovascular procedures, *i.e.* saphenous ablation obtained either by physical means, such as radiofrequency and laser, or chemical means such as ultrasound-guided foam sclerotherapy. A recent search on PubMed showed how over the past 18 months 116 papers dealt with endovenous laser ablation, 39 papers with endovenous radiofrequency ablation and 27 with foam sclerotherapy of the saphenous trunks.

Three years ago the Society of Vascular Surgery and the American Venous Forum³ have published their guidelines, which report the endovascular procedures as a new golden standard in the treatment of chronic venous disease of lower limbs.

Last year the guidelines of NICE⁴ have documented that the point of view of costs the endovascular procedures are preferable to traditional surgery.

In the United States of America moving from stripping to less invasive procedures has been driven by many factors, including the boost of the manufacturers of the devices, the insurance companies, the philosophy of less aggression in all surgical

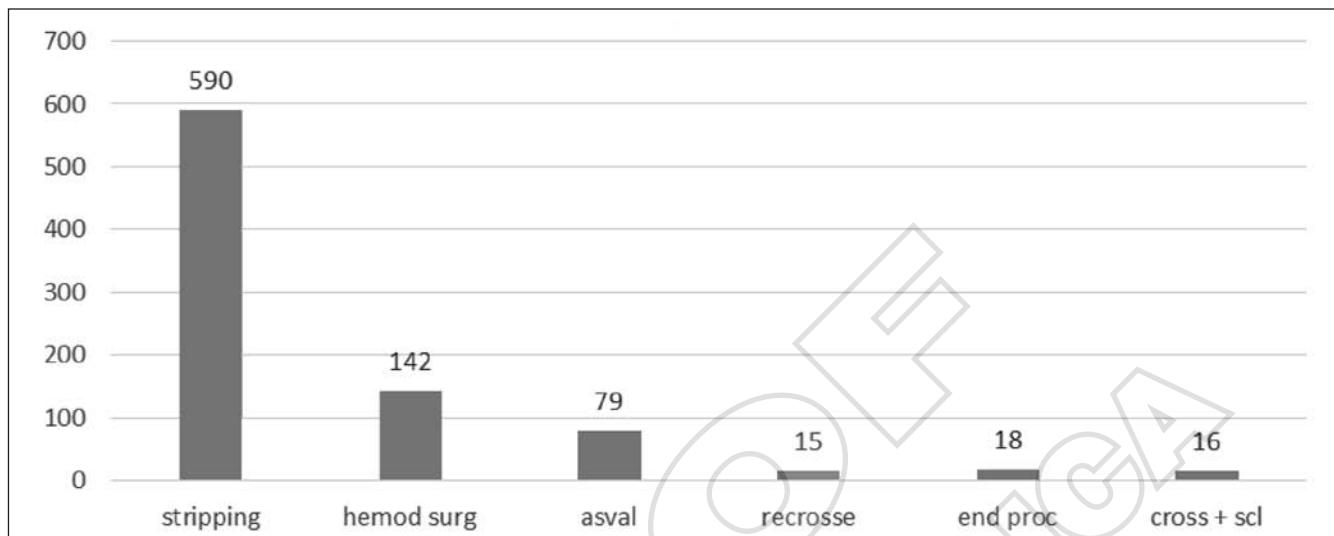


Figure 1.—Phlebological surgery at the Siena Hospital.

fields including phlebological surgery, and a tendency to renounce to everything that has been done in the past.

But surely in the world there are still some surgeons who perform the technique of saphenous stripping in patients in which it is chosen after preoperative ultrasound.

Thus, even if in some countries the saphenectomy by stripping is now performed less than in other countries of the world, it is sure that stripping is not dead and cannot be buried.

In the Gospel, Giovanni told us about the resurrection of Lazarus. After Jesus had gone to the tomb where his friend had been buried for 4 days, he ordered to remove the stone that closed the entrance to the tomb, he thanked God aloud and then cried: "Lazarus, come out" and Lazarus awoke and returned to life.

"Stripping, come out" can we say today about the surgery of saphenous vein by stripping, seemingly putting on one side and considered no longer useful in the light of modern knowledge of venous hemodynamics.

Materials and methods

At the Phlebological Unit of the Siena Hospital, directed by Prof. Joseph Botta, the traditional abla-

tive surgery in the treatment of patients with varicose veins of the lower limbs (CEAP 2-6) is always in first place compared to most modern endovascular ablation procedures with both physical and chemical means, so much so that in the last 3 years it continues to be performed in a percentage that approaches the 70% compared to the total of phlebological interventions performed annually.

In a group of 858 patients (554 F and 304 M) aged between 22 and 84 years 590 patients (68.7%) underwent saphenectomy by stripping, often associated with multiple phlebectomies of the thigh and/or leg; 142 patients (16.5%) underwent hemodynamic surgery; 79 patients (9.2%) underwent AS-VAL; 15 (1.7%) patients underwent revision of the saphenofemoral junction, associated with ablation of residual saphenous trunk; 18 patients (2.1%) underwent obliterative procedures with laser or radiofrequency; 16 patients (1.8%) underwent mixed technique with high ligation associated with sclerotherapy of the saphenous trunks (Figure 1).

Results

All treatments were completed and no procedure was abandoned due to technical difficulty. Neither mortality nor infectious complications were detected. We have found a case of hematoma in the thigh

in a subject operated by stripping with an anticoagulant treatment, because of serious heart disease. We had no thrombotic complication, neither immediate, nor at a 3-month follow-up. A clear improvement of patients' quality of life, evaluated with a personal questionnaire in follow-up controls, has been detected.

All of the techniques and procedures used in the treatment of varicose subjects come to our observation have satisfied our patients and, apart from economic reasons or dictated by fashion, traditional surgery turned still out to be as safe and efficient as the most modern thermal or chemical ablation procedures of saphenous trunks.

Discussion

Why did we title this report, which concerns the therapeutic strategy of varicose veins, the Lazarus syndrome? Because Lazarus is presented in chapter 11 of the Gospel of Giovanni as the dead person, who rises and returns to life after four days of burial.

Can the same thing happen for the saphenous surgery using the technique of stripping?

Certainly, in the light of the latest guidelines and scientific publications the saphenous stripping can no longer be considered the gold standard for the treatment of varicose veins caused by the insufficiency of the saphenous trunks. Most phlebologists do not agree and the debate is still open.

First of all the golden standard in medicine represents a procedure, a method, an operation which is recognized as the best available at that time and to which new protocols and results are compared. Now, to compare surgical technique such as stripping, which completely removes the saphenous veins, with endovascular procedures, either with physical means such as laser and radiofrequency or chemical means such as sclerotherapy, which leave in place the saphenous trunks, is not correct from the point of view of the results and the assessment of recurrence at follow-up.

As reported by Wright *et al.*⁵ the success of the method of varicose veins treatment depends largely on the experience of the operator, who performs the procedure. However, it is amazing how in the follow-up to 3 months of surgically treated patients, patients reported to have a 15% of residual venous reflux in the saphenous trunk, leading the authors to conclude

that the surgical procedure is imperfect in the treatment of varicose veins and resorting to sclerotherapy is preferable, as it has a success rate at 3 months of 98.3%.

And again the statistical data of the British Health Service, published in 2012 by Sutton *et al.*⁶ on the treatment of great saphenous vein with foam sclerotherapy show a thrombotic complication in 0.19% of cases, while the deep vein thrombosis complicates the 0.47% of endovenous laser ablation and 0.54% of stripping operations.

On the other hand, a prospective and randomized study of Rutgers⁷ had already demonstrated how the results of isolated treatment of saphenous stripping are higher than those obtained with high ligation associated with sclerotherapy.

Currently, it is undeniable that in some countries, as in the United States of America, there is a shift from stripping technique to less invasive procedures, but this is due to various factors, some of which have little to do with technical problems.

Because in recent years many phlebologist prefer the endovascular procedures?

Certainly if you consider the costs of operating room, anesthesia, materials used and the working hours of the staff involved, the total cost of the treatment is more or less similar in both cases, although the endovascular procedures require quite expensive equipment and especially disposable devices.

But the thrust of the manufacturers of such equipment imposes to phlebological market a discourse of "fashion", that emphasized the notion that minimally invasiveness translates in an esthetic discourse related to the beauty of the legs, which are subtracted from the hands of the surgeon.

Also the fear of bleeding and the legal and insurance consequences bring most phlebologists, to give priority to any procedure being proposed on the market, with the promise of resolving the varicose disease caused by saphenous insufficiency without attacking the same saphenous vein surgically.

For these reasons the growth rate of saphenous trunk obliteration has exponentially grown upward over the past decade, at the expense of saphenous stripping whose numerals have precipitated to zero.^{8, 9} As these procedures are reliable, with few complications and very low recurrence rates in 5 years,¹⁰⁻¹³ with the increasing experience of phlebologists there is little chance to stop and reverse the trend.

But the attack at the stripping also arrives from RCTs^{14,15} that compared hemodynamic surgery with the ablative surgery, showing a superiority of the first in terms of fewer recurrences and better results at a distance, so stripping is no longer regarded as the most successful therapeutic option for the treatment of varicose patients.

And then is saphenous stripping dead?

The data derived from the latest world literature would suggest so, because the endoluminal obliteration procedures begin in various countries to be reimbursed by the insurance companies.

Creton¹⁶ recently wrote that in lean patients with varicose veins the stripping can be performed in outpatient conditions (100%), in tumescent local anesthesia (100%) and without any sedation (80%), in terms that are nearly identical to endovascular procedures with very similar results for quality of life, while in obese patients the latter have a better indication than the stripping.

Even Pittaluga¹⁷ reported that he indicates high ligation when the saphenofemoral junction has a caliber exceeding 20 mm, while he performs a "modern short stripping" with anesthesia for tumescence and invagination when the saphenous vein in the thigh has a diameter in the upright position superior to 8 mm. In patients with clinical class C4-C6¹⁸ with incompetence of the terminal valve and saphenous reflux until the lower third of the leg, he prefers laser ablation associated with phlebectomies, the foam sclerotherapy in varicose recurrence and when the surgery would be too aggressive. In all other cases, accounting for 70-80% of his experience, he practices the ASVAL technique, which gives immediate cosmetic results, very bright and very much appreciated by patients.

In Italy there is no doubt that the modern procedures for saphenous trunks obliteration with physical or chemicals means are claiming more and more among phlebologists, especially among those of medical extraction, that have little or nothing confidence with the scalpel. However, in Phlebological Centers the traditional ablative surgery^{19,20} continues to be performed, either because the immediate and at distance results are absolutely similar to modern techniques and procedures for treating varicose disease, and also because the costs of equipment and disposable materials are still too high and not covered in the public health care system by insurance companies.

Conclusions

Our current experience leads us to conclude that surgery still represents for the long-term efficacy the therapeutic strategy of reference, but it is undeniable that the endovascular procedures for their minimally invasiveness, the reduced need for general anesthesia, the quicker return to work and recurrence rates more or less similar in the long term, are increasingly destined to become in the near future the gold standard of treatment of varicose disease.²¹⁻²³

However, considering the heterogeneity of the disease, for which more than one type of operations for all varicose patients can be performed, the saphenous stripping will always have a role, although even less important over time.

Certainly, current randomized clinical trials²⁴ begin to take into account the cost-effectiveness of the new procedures, but in countries where economic and insurance reasons prevent the massive use of same, the saphenous stripping is certainly effective and still valid, should be preceded by an accurate preoperative diagnosis with Duplex scanner, that documents hemodynamic insufficiency of saphenous vein.

Further studies and RCTs are needed to evaluate whether the modern obliteration procedures will lead to an improvement of the results within 10 years after treatment, considering however that the varicose disease is an evolutive disorder and, as such, susceptible to worsening over time.

Riassunto

La sindrome di Lazzaro

Obiettivo. Negli ultimi 10 anni le procedure endovascolari hanno preso il sopravvento nei paesi ricchi sullo stripping safenico. La letteratura recente è piena di lavori scientifici che magnificano i risultati delle procedure endovascolari e le linee guida di molti Paesi attribuiscono loro il ruolo di nuovo golden standard nel trattamento della malattia varicosa. Ma sicuramente nel mondo ci sono ancora dei chirurghi che eseguono la tecnica dello stripping safenico nei pazienti, nei quali viene posta l'indicazione dopo lo studio preoperatorio con gli ultrasuoni, per cui lo stripping non è morto e non può quindi essere portato a sepoltura.

Metodi. Nella nostra esperienza la chirurgia ablativa tradizionale nel trattamento dei pazienti con varici degli arti inferiori (CEAP 2-6) è sempre al primo posto e continua ad essere eseguita in una percentuale che si avvicina al

70% rispetto al totale degli interventi flebologici effettuati annualmente. Negli ultimi 3 anni su di un totale di 858 pazienti (554 F e 304 M) di età compresa tra i 22 e gli 84 anni, 590 di essi pari al 68,7% sono stati sottoposti a safenectomia per stripping, spesso associato a flebectomie multiple della coscia e/o della gamba.

Risultati. Tutti i trattamenti sono stati completati e nessuna procedura è stata abbandonata per motivi tecnici. Non si è avuta nessuna mortalità o complicanza infettiva. Lamentiamo un caso di ematoma alla coscia in una paziente operata di safenectomia per stripping in trattamento anticoagulante, perché cardiopatica. Nessuna complicanza trombotica immediata o a distanza nel follow up a 3 mesi è stata documentata.

Conclusioni. La nostra esperienza attuale ci fa concludere che la chirurgia rappresenta ancora per efficacia a lungo termine la strategia terapeutica di riferimento, ma è innegabile che le procedure endovascolari per la loro mini-invasività, le poche complicanze, la ridotta necessità di anestesia generale, il più rapido ritorno al lavoro e tassi di recidiva più o meno simili a lungo termine, sono destinate a diventare in un prossimo futuro il gold standard del trattamento della malattia varicosa. Considerando però l'eterogeneità della patologia, per cui non può essere eseguito un solo tipo di intervento valido per tutti i pazienti varicosi, probabilmente lo stripping safenico avrà sempre un ruolo, anche se esso sarà comunque ridotto nel tempo.

Parole chiave: Vene - Chirurgia vascolare - Stripping safenico.

References

- Nesbitt C, Bedenis R, Bhattacharya V, Stansby G. Endovenous ablation (radiofrequency and laser) and foam sclerotherapy versus open surgery for great saphenous vein varices. Cochrane Database Syst Rev 2014;7:CD005624.
- Van den Bremer J, Moll FL. Historical overview of varicose vein surgery. Ann Vasc Surg 2010;24:426-32.
- Gloviczki P, Comerota AJ, Dalsing MC, Eklof BG, Gillespie DL, Gloviczki ML *et al.* The care of patients with varicose veins and associated chronic venous diseases: clinical practice guidelines of the Society for Vascular Surgery and the American Venous Forum. J Vasc Surg 2011;53(5 Suppl):2S-48S.
- Marsden G, Perry M, Kelley K, Davies AH, Guideline Development Group. Diagnosis and management of varicose veins in the legs: summary of NICE guidance. BMJ 2013;24;347:f4279.
- Wright D, Gobin JP, Bradbury AW. Varisolve® polidocanol microfoam compared with surgery or sclerotherapy in the management of varicose veins in the presence of trunk vein incompetence: European randomized controlled trial. Phlebology 2006;21:181-90.
- Sutton PA, El-Dhuwaib Y, Dyer J, Guy AJ. The incidence of postoperative venous thromboembolism in patients undergoing varicose vein surgery recorded in Hospital Episode Statistics. Ann R Coll Surg Engl 2012;94:481-3.
- Rutgers PH, Kitslaar PJ. Randomized trial of stripping versus high ligation combined with sclerotherapy in the treatment of the incompetent greater saphenous vein. Am J Surg 1994;168:311-5.
- Almeida J, Mackay E, Javier J, Mauriello J, Raines J. Saphenous laser ablation at 1470 nm targets the vein wall, not blood. Vasc Endovascular Surg 2009;43:467-72.
- Mauriello J. Endovenous laser ablation of varicose veins: Presented at IUA world Congress 2010. Buenos Aires-Argentina, 21-25 aprile 2010.
- Biemans AA, Kockaert M, Akkersdijk GP, van den Bos RR, de Maeseneer MG, Cuypers P *et al.* Comparing endovenous laser ablation, foam sclerotherapy, and conventional surgery for great saphenous varicose veins. J Vasc Surg 2013;58:727-34.
- Rasmussen L, Lawaetz M, Bjoern L. Randomized clinical trial comparing endovenous laser ablation and stripping of the great saphenous vein with clinical and duplex outcome after 5 years. J Vasc Surg 2013;58:421-6.
- Samuel N, Wallace T, Carradice D, Mazari FA, Chetter IC. Comparison of 12-w versus 14-w endovenous laser ablation in the treatment of great saphenous varicose veins: 5-year outcomes from a randomized controlled trial. Vasc Endovascular Surg 2013;47:346-52.
- Kalodiki E, Lattimer CR, Azzam M, Shawish E, Bountouroglo D, Geroulakos G. Long-term results of a randomized controlled trial on ultrasound-guided foam sclerotherapy combined with saphenofemoral ligation vs standard surgery for varicose veins. J Vasc Surg 2012;55:451-7.
- Parés J, Juan J, Tellez R, Shawish E, Bountouroglo D, Geroulakos G. Varicose vein surgery: stripping versus the CHIVA method: a randomized controlled trial. Ann Surg 2010;251:624-31.
- Carandina S, Mari C, De Palma M, Marcellino MG, Cisno C, Legnaro A *et al.* Varicose vein stripping vs haemodynamic correction (CHIVA): a long-term randomised trial. Eur J Vasc Endovasc Surg 2008;35:230-7.
- Creton D, Réa B, Pittaluga P, Chastanet S, Allaert FA. Evaluation of the pain in varicose vein surgery under tumescent local anaesthesia using sodium bicarbonate as excipient without any intravenous sedation. Phlebology 2012;27:368-73.
- Pittaluga P, Chastanet S, Rea B, Barbe R. Risultati a medio termine del trattamento chirurgico delle varici da flebectomia con conservazione di una vena safena refluenente. J Vasc Surg 2009;1:107-18.
- Kistner RL, Eklof B, Masuda EM. Diagnosis of chronic venous disease of the lower extremities: the 'CEAP' classification. Mayo Clin Proc 1996;71:338-45.
- Botta G, Mancini St, Baldoni G, Mancini S. The ideal technique for the surgery of varicose veins. Acta Phlebologica 2009;10:86-7.
- Mancini S, Botta G, Mariani F. La safenectomia per stripping. Trattato di Flebologia e Linfologia di Mancini. Torino: UTET; 2001. Vol. 1, p. 413-22.
- Botta G. Il trattamento laser endovenoso della malattia varicosa. Acta Phlebologica 2006;7(Suppl 1 al n.2):5.
- Botta G. Indicazioni, controindicazioni e complicanze del trattamento laser endosafenico. Med Est 2008;32:153-4.
- Botta G, Santoro P, Setacci F, Mancini S. Bipolar radiofrequency in the treatment of patients with varicose veins. Acta Phlebologica 2011;12:16-8.
- Carroll C, Hummel S, Leaviss J, Ren S, Stevens JW, Cantrell A. Systematic review, network meta-analysis and exploratory cost-effectiveness model of randomized trials of minimally invasive techniques versus surgery for varicose veins. Br J Surg 2014;101:1040-52.

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