

Role of the haemodynamic mapping in varicose vein surgery of lower limbs



Ann. Ital. Chir., 2016 87: 392-395

Antonio Sellitti*, Ermenegildo Furino***, Aurelio Nasto*, Angelo Di Filippo**, Maria Elena Sellitti*, Marco Apperti****, Gennaro Quarto***

*General and Oncological Surgery Unit, "A. Tortora" Hospital, Pagani (Salerno), Italy

**Emergency Medicine Unit, "A. Tortora" Hospital, Pagani (Salerno), Italy

***Department of Clinical Medicine and Surgery, "Federico II" University, Naples, Italy

****Past-President of S.I.F., Società Italiana di Flebologia (Italian Society of Phlebology)

Role of the haemodynamic mapping in varicose vein surgery of lower limbs

AIM: To demonstrate the importance of preoperative ultrasound haemodynamic mapping of venous system in surgery of varicose veins.

MATERIALS AND METHODS: Doppler ultrasound evaluation of haemodynamic features of lower limb venous system according to Franceschi's subdivision.

DISCUSSION: The importance of Doppler mapping in varicose veins surgery shows a similarity with the Plebographic classification of venous system developed by W. Hach. The study also reassesses the role of varicectomy in the surgery of varicose veins.

CONCLUSIONS: Preoperative Doppler ultrasound mapping is essential to avoid accident and prevent recurrence of varicose veins.

KEY WORDS: Doppler US, Surgery, Great Saphenous Vein, Varicose Veins, Stripping,

Surgery of varicose veins implies anatomical knowledge and ultrasound-guided mapping of saphenous-femoral and sapheno-popliteal junctions, their tributaries and perforating systems, to avoid peri-procedural accidents and prevent varicose recurrence.

W. Hach was the precursor of the haemodynamic ablative surgery, which, substantially, eliminates reflux points and removing sick venous segments. Since the beginning of the 70s, with the help of venography, W. Hach had realized that it was not necessary to undertake a long stripping of great and small saphenous vein, but it was possible to perform a segmental excision, or ligation, or a ligation-interruption of perforating veins: the varicectomy.

W. Hach with his flebographical trial developed an anatomical and functional classification of varicose disease (H1, H2, H3, H4), and indicated a surgical strat-

egy that today is fully confirmed in Doppler ultrasound studies.

The haemodynamic surgical ablation includes:

- Selective crossectomy with epigastric vein sparing (when possible);
- Stripping of the accessory saphenous systems (19% of cases). (Hach 1 stage);
- Ultra-short stripping of the great saphenous vein, from saphenous-femoral junction to the middle third of the lower leg (41% of cases). (Hach 2 stage);
- Short stripping of the great saphenous vein, from saphenous-femoral junction to the upper third of the leg (31% of cases). (Hach stage 3).
- Long stripping of the great saphenous vein, from saphenous-femoral junction to the medial malleolus (in 9% of cases), Hach stage 4;
- Stripping of the external saphenous vein, from the sapheno-popliteal junction to lateral malleolus (less than 1%) or, more frequently, mid-calf (short stripping);
- Varicectomy;
- Review of the SF and / or SP junction;
- Binding/breaking of perforating vein, to complete ablation of the saphenous trunks.

Correspondence to: Antonio Sellitti, 36 Atzori Street, 84014 Nocera Inferiore, Salerno, Italy (e-mail: antoniosellitti@alice.it)

Materials and Methods

The modern acquisitions of hemodynamic study of the superficial venous system of the lower limbs allow to make a proper morpho-functional preoperative mapping, aimed at a surgical approach that avoids or reduces technical errors. Duplex ultrasound, used in accordance with the method of study of C. Franceschi (subdivision of the venous system in compartments N1, N2, N3, N4T, N4L and Shunt), allows to evaluate:

- Anatomical variability of venous system;
- Valves;
- Vanishing points and of return points;
- Direction of flow;
- Results of static and dynamic maneuvers.

These parameters are essential to stage varicose disease and make a correct surgical procedure. However, in daily practice we noticed a similarity between the models studied with Doppler ultrasound of varicose disease and the anatomical-phlebographic classification of Hach. We can also assert that ultrasound reassessed the varicectomy, once considered an aesthetic treatment (“elimination of the visible”).

Indications:

- to complete an ultra-short, short or long stripping and in relapse;
- not dilated saphenous axis, with incontinent preterminal valve and continent terminal valve;
- N2> N3 reflux (with short saphenous-femoral incontinence) and saphenous vein below the continent;
- N1> N3 reflux;
- reflux of N3 departing from the crosse and continent saphenous trunk;

- presence of drilling of return on saphenous vein (usually below the knee);
- very young or elderly patients where a not aggressive surgery can be justified (difficult to determine trends in the first case, functionally adequate results in the second case);
- small caliber varices in patients who refuse sclerotherapy;
- other conditions: ischemic heart disease or peripheral arthropathy, liver disease, psychological causes, etc.

Considerations

Varicectomy can be held as intervention of choice and not “palliative” in more than 50% of patients suffering from varicose veins.

Surgical procedure (isolated varicectomy and / or completion of work on the System of the internal or external saphenous vein) is performed in Day-Surgery, usually under local anesthesia or spinal anesthesia, performing small incisions that do not modify the aesthetics.

The collateral varicose veins, when they are not very tortuous, instead of being removed by Muller technique may be cannulated and removed with ministripping.

In case of short or ultra-short saphenous stripping, after accurate preoperative marking, it is possible to perform a “in-block cannulation” saphenous vein + extra-saphenous-collateral (N2 + N3).

After surgery compression it is performed using an elastic bandage or an elastic stocking.

Patients can be discharged after a few hours of surgery or at most the day after recovering fully ambulatory, in cases of need, even on the job.

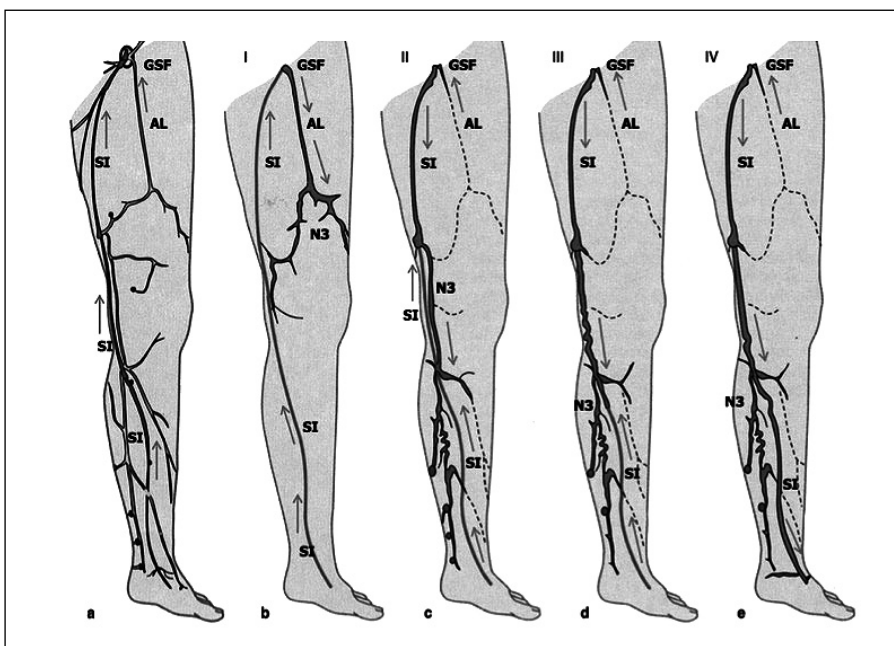


Fig. 1

Conclusions

Ablative treatment in the surgery of varicose veins born thanks to the genius of Wolfgang Hach, precursor of a conservative surgical procedure aimed to the exeresis of pathological venous after clinical and phlebographic evaluation, and, subsequently, in the hemodynamical studies of Claude Franceschi hemodynamic and anatomical studies of Giuseppe Genovese. The ablative treatment is the gold standard in varicose vein surgery only if it is preceded by a careful Doppler ultrasound study. The study hemodynamic preoperative with ultrasound, replacing in time almost completely the examination phlebography, prevents and / or reduces technical errors, in order to obtain a satisfactory aesthetic and functional result, long-lasting.

Riassunto

Nella chirurgia delle varici, la conoscenza anatomica e ultrasonografica della giunzione safeno-femorale e delle sue tributarie, della giunzione safeno-poplitea e dei sistemi perforanti è essenziale per un buon trattamento, per evitare incidenti e prevenire recidive varicose. Il trattamento ablativo nella chirurgia delle vene varicose, è nato grazie al genio di Wolfgang Hach, precursore della procedura chirurgica conservativa finalizzata alla exeresi del solo tratto venoso patologico dopo valutazione clinica e flebografica. Successivamente la chirurgia ablativa emodinamica si è evoluta grazie agli studi emodinamici di Claude Franceschi e agli studi anatomici di Giuseppe Genovese. Nella pratica quotidiana, abbiamo notato una sovrapposizione tra i modelli di malattia varicosa studiati con Eco-color-Doppler e la classificazione anatomico-flebografica di Wolfgang Hach.

References

1. Apperti M, Sellitti A, Verde I: *Ambulatory varicectomy*. Atti 14 th Word Congress U.I.P. Rome, September 9-14 2011, pag. 314.
2. Apperti, Sellitti A: *Proposta di metodica alternativa alla varicectomia ambulatoriale*. Atti com. 102° Congr. Naz. S.I.C. Roma 15-20 ottobre 2000, pag. 200.
3. Cardamone B, Sellitti A, Apperti M, Di Filippo A, Quarto G: *Anatomia del sistema venoso degli arti inferiori*. Updates in Flebologia, 2012; 12-16.
4. C.I.F.: *Linee Guida diagnostiche-terapeutiche delle malattie delle vene e dei linfatici*. 2003; 4(1):2.
5. Delfrate R: *Manuale di emodinamica venosa degli arti inferiori*. Parma: Ed. Ass. Umanizzazione della ???, 2011.
6. Di Filippo A, Cardamone B, Riccio I, Sellitti A, Giordano R.: *La giunzione safeno-femorale: anatomia ecografica e varianti anatomiche*. Comunicaz. Congr. Naz. S.I.F. Ostuni 25-27 maggio 2012.
7. Donadi GC, Genovese G: *Flebologia*. Milano: Nuove Edizioni, 1994.
8. Franceschi C: *Théorie et pratique de la cure CHIVA*. Prècy-sous – Thil:Ed. de l'Armanoçon, 1988.
9. Genovese G: *Superficial Epigastric Vein Sparing in Saphenous-Femoral Crossectomy*. 26th World Congress of the International College of Surgeons, 1988.
10. Genovese G: *News on Crossectomy of Sapheno-Femoral Junction*". Main lecture 15th of the I.U.P. world congress, Rio de Janeiro, Brasil 2005.
11. Genovese G: *Treatment of Varicose Veins News*. Main lecture world congress Asian Chapter of the I.U.P. Kyoto, Japan. 2007.
12. Genovese G: *News on Crossectomy of Sapheno-Femoral Junction*. International Angiology, 2007; 26(2):68.
13. Genovese G: *Rol de las colaterale en la recidiva de lev*. Main lecture XIV Congreso Internacional del Colegio Argentino de Cirugia Venosa y Linfatica, Buenos Aires, Argentina 2010.
14. Genovese G: *Chirurgia delle vene e dei linfatici*. Milano: Ed. Masson, 2003.
15. Hach W: *Venen chirurgie. Rezensionen*. Schattauer Verlag. 2007; 368 seiten.
16. Hach W: *Phlebographie der Bein, und Beckenvenen*. Stnetzto. Konstanz, 1985.
17. Hach W: *Rezirkulationskreise der Stammvarikose und ihre chirurgische therapie*. Herz u. Gefäße, 1991; 11:136-45.
18. Hach W, Hach-Wunderle V: *Phlebographie der Bein, und Beckenvenen*, 4 edit. Berlin: Springer, 1994.
19. Hach W, Hach-Wunderle V: *Die Untersuchung des venenkranken Patienten*. Z. Allg. Med. 68, 1992; 679-85.
20. Hach W, Hach-Wunderle V: *Die sekundäre Popliteal, und Femoralvenen-insuffizienz*. Phlebologie, 1992; 21:52-58.
21. Mancini S: *Trattato di Flebologia e Linfologia*. Torino: Ed. U.T.E.T., 2001.
22. Mancini S: *Manuale di Flebologia*. Colle Val d'Elsa: Laris editrice, 2009.
23. Mariani F: *Selective crossectomy", of the great saphenous vein: result at five years*. Acta Phlebologia, 2008; 9(1):6.
24. Mumme A: *Die Hach-Klassifikationen als Leitlinie für die operative Therapie der Stammvarikosi*. Relaz. 19° Congr. "Flebs des Alpes" Alta Badia 8-11 Febbraio 2011.
25. Ricci S, Georgiev M: *Flebectomia ambulatoriale*. Bologna:Ed. P.R., 1999.
26. Sellitti A. et all: *Mappaggio morfo-funzionale e trattamento delle varici: la chirurgia ablativa*. Updates in Flebologia, 2012; 35-37.
27. Sellitti A: *Diagnostica strumentale del paziente varicoso*. Relaz Meeting Soc Int Dermatologia, Sorrento 3-8 luglio 2000.
28. Sellitti A, Apperti M: *Tipi e tecniche di stripping*. Atti 100° Congr Naz S.I.C. Roma 11-16 Ottobre 1998; (4); 111-7.
29. Sellitti A: *Le varici degli arti inferiori: Terapia di exeresi o emodinamica?* Riv. Salerno 1999, 16-17.
30. Sellitti A, Giordano R, Apperti M: *La chirurgia ablativa del*

- sistema venoso superficiale con finalità emodinamica: orientamenti attuali.* Atti 32° Congr. Naz. SIAPAV Padova 17-20 novembre 2010. Minerva Cardioangiol, 2010; 58 (Suppl. 1 al n. 6): 181-2.
31. Sellitti A, Di Filippo A, Pagano M, Giordano R, Apperti M: *La classificazione di Hach e la chirurgia delle varici degli arti inferiori.* Atti 34° Congr. Naz. SIAPAV Napoli 21-24 novembre 2012, Minerva Cardioangiol, 2010; 60 (Suppl. 1 al n. 6): 169-71.
32. Stritecky, Kähler: *Cirurgia de las venas varicosas* - Marban Libros, S.L. 1997, Edición española.
33. Viani MP, Nano G, Mazzacarro D, Stregher S, Pinto A, Riva A, Sparacio F, Farina A, Tealdi DG: *Recurrent varicose vein: histopathological evaluation and new perspectives. Preliminary results.* J Vasc and Endovasc Surg, 2010; 17(3): 277-83.
34. Cestaro G, Furino E, Solimeno G, Gentile M, Benassai G, Massa S, Quarto G: *The role of epigastric vein sparing in the treatment of chronic venous disease: A retrospective study.* Acta Phlebol, 2014; 15: 143-47.
35. Zaraca F, Hebner E: *Cause e trattamento delle varici recidive degli arti inferiori.* Chirurgia Italiana, 2005; 57(6): 761-65.
36. Genovese G, Furino E, Quarto G: *Superficial epigastric vein sparing in the saphenous-femoral crosssection or in the closures of the saphena magna.* Ann Ital Chir, 2015; 86:383-85.
37. Quarto G, Amato B, Giani U, Benassai G, Gallinoro E, Apperti M, Furino E: *Comparison of traditional surgery and laser treatment of incontinent great saphenous vein. Results of a meta-Analysis.* Ann Ital Chir, 2016; 87:61-7.