

Literature Spider

© 2023 Fondazione Vasculab impresa sociale ONLUS. All rights reserved.

by Stefano Ricci
literatureSpider@vasculab.org

Web bots and spiders commonly scan the Internet to find and store relevant information, following in depth the detected links on the visited pages.

By analogy, this section is devoted to the selection of interesting vascular papers, providing an extended

summary (more than an abstract) and a very personal comment.

Following the spirit of the journal, readers' opinion is welcome, especially if different. Colleagues are invited to collaborate, suggesting valuable articles and hopefully reviewing them.

Practical instructions are available at the address <http://www.vasculab.eu/jtavr/literatureSpiderInstructionsForAuthors.pdf>

Chronicle of "CHIVA"

S Ricci¹

¹Private practice, Roma

submitted: Sep 14, 2023, accepted: Sep 14, 2023, Epub

Ahead of Print: Nov 13, 2023, published: Dec 31, 2023

Conflict of interest: None

DOI: [10.24019/jtavr.174](https://doi.org/10.24019/jtavr.174) - Corresponding author: Prof. Stefano Ricci, varicci@tiscali.it

© 2023 Fondazione Vasculab impresa sociale ONLUS. All rights reserved.

Abstract Three recent papers [appeared in the international phlebological literature concerning CHIVA method for treating Great Saphenous Vein (GSV) incompetence] are analysed, accurately summarized and commented. One paper concerns a specific condition GSV (dilatation >9 mm) while the others compare the CHIVA to Radio Frequency (both) and stripping (one). The comment underlines the tendency of interpreting the CHIVA method in a simplified incorrect way, neglecting the fundamental problem of Shunt3 condition.

Keywords CHIVA, Large diameter GSV, Shunt 3, post op. thrombosis, haemodynamic correction.

Detailed summary

The CHIVA strategy applied to large-diameter saphenous veins¹.
Tenezaca-Sari X, et al.

CHIVA reduces the recurrence of varicose veins and causes less nerve damage and bruising than vein stripping. It is applicable to

all types of veno-venous shunts, but its use in great saphenous veins (GSVs) with a diameter #9 mm is associated with an increased risk of symptomatic superficial vein thrombosis (SVT) (three times higher) due to insufficient blood drainage .

To reduce this risk a modified two-stage strategy is used. In first stage, the main reflux escape point was interrupted by disconnecting the Sapheno-Femoral Junction, lowering venous pressure and flow, achieving a sufficient reduction in GSV diameter to enable a second stage with a lower risk of symptomatic SVT.

In a retrospective observational study 111 patients were included, 60 men (54.1%) and 51 women (45.9%) women with a mean \pm SD age of 57 ± 11 years and a mean follow-up of 29.3 ± 29.7 months. A type 3 shunt was present in 79.3% of cases and a type 1+2 shunt in 20.7%. All the patients had very pronounced varicose veins.

Patients with insufficient clinical improvement or aesthetic demand were submitted to a second stage, by tributary disconnection from the GSV after evaluation at 6 months and 12 months. 86 patients (77.5% of cases) showed significant clinical improvement after the first stage.

Interruption of the reflux exit point resulted in a mean reduction in GSV diameter of 3 ± 1.6 mm. The maximum reduction in GSV diameter was reached at 6 months, and practically no changes occurred after this point.

Six patients (5.4%) experienced recurrence due to recanalization of the escape point. Sixteen patients (14.4%) developed SVT, which was symptomatic in 12 cases. Twenty-five patients (22.5%) underwent the second stage of the CHIVA strategy by phlebectomy

Comparison between radiofrequency ablation and CHIVA procedure in patients with varicose veins².
Seungjoon Lee, et al.

The Authors retrospectively analysed the clinical recurrence, ultrasound recurrence, quality of life scores, and complications in 212 limbs of 166 patients that in 42 limbs underwent radiofrequency ablation (RFA) and in 170 limbs underwent CHIVA. C2 to C6 patients with GSV reflux > 5 sec. were included in the study without any specification of shunt type. RFA was carried in general or local anaesthesia, positioning the catheter tip 2 cm below the Sapheno-Femoral junction (SFJ) using ultrasound guidance after tumescent solution infiltration. Concomitant phlebectomy was performed. CHIVA treatment was done according to Franceschi rules, in local anaesthesia without concomitant phlebectomy. In the post operative phase, anticoagulation was used only in cases with suspect of stasis for

insufficient drainage of the GSV (in practice the CHIVA cases Editor's comment). Compression stockings and early ambulation were prescribed.

Clinical recurrence in both groups was defined as any new and palpable varicose veins >4 mm due to neovascularization or technical errors; For the RFA group, a patent segment of ablated GSV >5 cm in length was considered as an ultrasound recurrence; in the CHIVA group a new reflux from the SFJ, perforator vein, or pelvic collaterals or a new reflux from the GSV into the tributary veins was considered an ultrasound recurrence.

Propensity score matching (PSM) was used to minimize bias and compensate for shunt types incidence as shunt III was at 76% in the CHIVA group and 33% in RFA group, so that the difference in the shunt type was corrected when 42 cases in the CHIVA group were compared with 42 cases in the RFA group with the same shunts type. The clinical recurrence at 2 years after RFA was 7.2%, and DUS recurrence was 13%. In the CHIVA group, clinical recurrence was 14.7%, and DUS recurrence was 46.7%.

Clinical recurrence rates did not differ in groups; Ultrasound recurrence-free rates in the RFA group were 96.9% at 6 months and 96.9% at 12 months. In the CHIVA group, they were 90.2% at 6 months, 84.2% at 12 months, and 95% after PSM analysis. In CHIVA group recurrences were observed more frequently when GSV calibres were larger. Both groups showed improved venous clinical severity scores (VCSS), Aberdeen varicose vein questionnaire (AVVQ) scores, venous reflux time (VRT), and reduced GSV diameter after treatment. Complication occurrence was similar in the two groups.

RFA seems not inferior to CHIVA when recurrences, complications and QoL are concerned. CHIVA has the advantage that most patients are treated with local anaesthesia, and the hospital stay is shorter. CHIVA in patients with small blood vessel diameters could be a convenient and efficient treatment method when compared with the expensive catheter-using endovenous procedures. In addition, the saphenous veins is preserved for possible arterial bypass surgery in ever-aging population.

A randomized controlled non-inferiority trial comparing radiofrequency with stripping and CHIVA technique for insufficiency of the great saphenous vein³.
González Cañas E, et al.

In a randomized, single-centre, open-label, controlled, noninferiority trial comparing RFA with High Ligation and stripping (HL/S) and CHIVA for the treatment of primary VV due to GSV insufficiency, 225 patients aged over 18 years with primary VV and GSV incompetence, with or without clinical symptoms, C2 - C6 clinical class of CEAP and GSV diameter >4 mm were randomized with a 1:1:1 ratio.

(HL/S): Complete disconnection of SFJ and tributaries using non absorbable sutures, associated with invaginating stripping of above-knee GSV

Radiofrequency: Percutaneous insertion of a 7-cm heating intraluminal catheter into the GSV, positioned 2 cm below the SFJ under ultrasound guidance. Tumescence local infiltration was performed with saline solution.

CHIVA: A single surgical procedure called CHIVA 1+2 by interruption of the refluxing saphenous trunks, disconnection of venous-venous shunts and abolition of undrained varicose veins with preservation of the communicating perforator veins. Most interventions in the RFA and HL/S groups were performed under general anaesthesia (87.9% and 14 80.9% respectively while in the CHIVA group, 57% of procedures were performed under local anaesthesia and sedation,

40% with general and 3% with spinal. Concomitant phlebectomies were performed in all three surgical procedures.

Clinical recurrence at 24 months, as primary endpoint (visual and palpable detection by an independent observer of new VV absent at 1-month follow-up) was: 7.2% (95%CI: 1.1; 13.4) in the RFA group (5 patients), 4.3% (95%CI: -0.5; 9) in the HL/S group (3 patients) and 14.7% (95%CI: 6.7; 22.7) in the CHIVA group (11 patients).

DUS recurrence was detected in 5 patients (7.1% (95%CI: 1.1; 13.2)), 9 patients (13% (95%CI: 5.1; 21)), and 35 patients (46.7% (95%CI: 35.4; 58)) for HL/S, RFA and CHIVA groups, respectively.

Recurrences after HL/S were due to neovascularization at SFJ (3 patients) and incomplete elimination of reflux caused by the presence of a tributary parallel collateral to the GSV (2 patients).

In the RFA group, DUS recurrence was due to the presence of a tributary parallel collateral to the GSV (2 patients), a Hunter perforator (1 patient), neovascularization due to incompetent pelvic veins at SFJ (1 patient) and anterior accessory saphenous vein (1 patient). Four patients had complete recanalization of GSV. As RFA does not access the groin less neovascularization as a cause of recurrence is found, but slight reflux and substantial thickening of the treated GSV wall was detected, without clinical recurrence.

For the CHIVA group, the cause for DUS recurrence was neovascularization at SFJ and new pelvic veins in 11 patients, and insufficient GSV without a drainage perforator in 24.

There were no differences in quality of life between groups.

For DUS recurrence, the hypothesis of noninferiority of RFA compared to HL/S could not be confirmed, but RFA was shown to be non-inferior and even superior to CHIVA.

Comments

The chosen papers concern recent CHIVA publication, casually two coming from Spain and in particular from Barcelona, where two Universities Schools seem in opposition. Even more interesting is that all concern shunt 3 management.

In the first paper¹ about large GSV treatment the Authors belong to a group well inserted in the CHIVA method (see letter hereinafter (4)); probably that is the reason why they see CHIVA in every procedure they face. In this case they perform a High ligation and section of the SFJ like was suggested by several Authors at the half of the last century. In addition, no mention is made of a possible crossotomy, in opposition to crossotomy, that in Franceschi suggestion has the advantage of maintaining a flow by junction's tributaries, although reduced, but able to avoid complete stasis in the GSV. The second stage, by phlebectomy, without any mention to the shunt types, is another aspect that aways the suggested method from CHIVA strategy; as a consequence, we can consider the suggested method a (deserving) conservative strategy with nothing in common with CHIVA. Furthermore, the 10% of GSV thromboses is compared to no other incidence reports (apart a congress communication) so that it is difficult to state the utility of the suggested surgical strategy for avoiding thromboses. Finally, it is not clear how the need of

the second stage is decided: what does clinical improvement mean and how is it measured?

The second paper represents the exception where CHIVA is the reference method and RFA is the alternative, trying to state that the alternative is better than the reference. However, the CHIVA management is badly performed and not fairly compared to RFA. In fact, the most striking contradiction for a CHIVA follower is to do the so called 1+2 correction (S-F disconnection and tributary disconnection in the same time) in the Shunt 3 cases leaving a non-drained GSV, that can induce thrombosis, the most frequent complication reported (9,5%); at the opposite, these are the ideal cases for RFA treatment. If shunt 3 cases (the prevalent) had been treated in two stages (the true “invention of this method) results could be more favourable to conservative strategy. Phlebectomy instead of disconnection of tributaries makes also a debatable subject even if less important. In any case, local anesthesia, shorter hospitalization, saphenous preservation (and probably lower costs) significantly contributes to patient’s preference for CHIVA if a right informed consensus to the patient is offered.

The third paper, a randomized comparison of HL/S, RFA and CHIVA gave the worst result to the last method.

For the CHIVA group, the main cause for DUS recurrence was neovascularization at SFJ and new pelvic veins in 11 patients, and insufficient GSV without a drainage perforator in 24.

In this group 72% of the cases were a Shunt 3 type, which was corrected by the so called 1+2 strategy (Junction disconnection + tributary phlebectomy) well known to induce a non-drained residual system in absence of any voiding escape route, which can explain the 24 related recurrences. Concerning the junction recurrences, the crossectomy instead of the crossotomy could have some aggravating contribution.

References

- 1) Tenezaca-Sari X, García-Reyes M, Escribano-Ferrer Jm, Marrero C, Bellmunt-Montoya S. The CHIVA strategy applied to large-diameter saphenous veins. *International Angiology* 2022 August;41(4):332-7 DOI: [10.23736/S0392-9590.22.04831-3](https://doi.org/10.23736/S0392-9590.22.04831-3)
- 2) Seungjoon Lee, Sangchul Yun, Jiyoung Lee, Sang Hyun Kim, Myung Hoon Ihn, Daegwang Yoo, So Kyung Yun and Mi-OK Hwang. Comparison between radiofrequency ablation and CHIVA procedure in patients with varicose veins. *Phlebology* 2023, Vol. 38(7) 427–435 DOI: [10.1177/02683555231181857](https://doi.org/10.1177/02683555231181857)
- 3) González Cañas E, Florit López S, Vives Vilagut R, Guevara Noriega K, Santos Espí M, Ríos J, Navarro Soto S, Giménez Gaibar A. A randomized controlled noninferiority trial comparing radiofrequency

In contradiction of the Authors sentence: “*with the CHIVA technique as all patients required an individualized strategy*”, it seems instead that a “good for everything” technique was employed.

This same dispute was introduced by a letter to Editor of JVS⁴ :

Escribano JM, Bellmunt S. Applying the correct CHIVA strategy in a randomized, controlled trial.

where the Authors conclude: “the CHIVA strategy chosen was not the best approach to apply this hemodynamic technique and the results should be interpreted with caution”.

In the reply letter to the editor⁵ by **González Cañas E et al.** the paper’s Authors based their choice of the 1+2 (non-drained) strategy on the fact that the CHIVA 2 (drained) strategy was not stated by sufficient literature evidences, not confirmed in any randomized, controlled trial. They state that there is no “*evidence to conclude that draining ambulatory conservative hemodynamic management is superior to nondraining ambulatory conservative hemodynamic management*”, which seems a little contradictory to the sentence stated few lines before: “*This principle (haemodynamic correction -Ed.) was used as a landmark for all our CHIVA procedures*”.

The most important concepts introduced by Franceschi is that any correction must be performed by a draining system, most of the times through the way of a perforator. In this perspective shunt 3 systems represent a paradigm; the use of two staged correction could represent the symbol of CHIVA. The fact that CHIVA involved Authors tend to cancel this important aspect represents a serious sign of involution of the method.

with stripping and CHIVA technique for insufficiency of the great saphenous vein. *Journal of Vascular Surgery: Venous and Lymphatic Disorders* (2020). DOI: [10.1016/j.jvsv.2020.04.019](https://doi.org/10.1016/j.jvsv.2020.04.019).

4) Escribano JM, Bellmunt S. Applying the correct CHIVA strategy in a randomized, controlled trial. *LETTER TO THE EDITOR| Journal of Vascular Surgery: Venous and Lymphatic Disorders* 2021; 9: 286, DOI: [10.1016/j.jvsv.2020.07.013](https://doi.org/10.1016/j.jvsv.2020.07.013)

5) González Cañas E, Florit López S, Guevara-Noriega KA, Gimenez Gaibar A. Reply *LETTER TO THE EDITOR|* 2021; 9:-287. DOI: [10.1016/j.jvsv.2020.08.009](https://doi.org/10.1016/j.jvsv.2020.08.009)