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Varicose veins surgery of lower limbs. Can we preserve great saphenous vein?

Cirurgia nas varizes dos membros inferiores. Podemos preservar a veia safena magna? *

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ABSTRACT

Introduction: Varicose veins are frequent and cause problems for patients and health care services. Varicose vein surgery is one of the three more frequent surgical procedures. Eco-Doppler observations have changed completely concepts of varicose veins beginning and progression with great reflex on clinical practice and treatment. Eco-Doppler as shown great saphenous vein (GSV) as an inter-fascial vein and not a superficial one, varicose veins with competent saphenofemoral junction as well as varicose veins just involving collaterals or collaterals with segments of GSV but not a continuous descending involvement of the GSV. Consequently two main patterns of venous reflux as been defined: the axial reflux with a continuous reflux of GSV trunk from groin to malleolus and the segmental reflux with reflux of segments of saphenous trunk but not a continuous descending reflux starting at the junction. This segmental reflux pattern presents in our practice three sub-types: sub-type 1, just involving superficial branches, sub-type 2, involving superficial branches plus segments of saphenous trunk and sub-type 3 with reflux of saphenofemoral junction plus tight collateral, with a non dilated GSV bellow the confluence of this collateral. **Aim**: Can we preserve the GSV when treating varicose veins with a segmental reflux pattern? Can we do a much lesser aggressive and quick surgery with equal or even better results as with classic surgery? **Metolodgy**: 54 consecutive patients with segmental reflux pattern operated on with phlebectomy of varicose superficial collaterals and with preservation of GSV. Clinical follow-up with symptomatic relieve, cosmetic results and no recurrence of varicose veins expressed as worthwhile surgery. Eco-Doppler follow – up expressed as: disappearance of previous segmental reflux of GSV, maintenance of previous reflux or progression of segmental reflux to an axial one. Mean follow-up time: 12,1 months. **Results**: Clinical results: 98,5 of patients consider surgery as worthwhile. Eco-Doppler results: 58% with no reflux, 40 % with maintenance of previous reflux and just 1 case (2%) with progression of reflux to an axial pattern. **Conclusions**: Clinical and eco-Doppler results of our study, support preservation of GSV when the pattern of reflux is a segmental one. The answer to our question: can we preserve the GSV is a positive yes we can. Our findings also support the concept that varicose veins are a local and multifocal process starting at any vein segment and not a progressive descending one starting at the sapheno-femoral- junction. Superficial varicose branches appear as main players and not the saphenous trunk as consider before.

Key words: *varicose veins, great saphenous vein, reflux patterns, eco-Doppler.*

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RESUMO

Introdução: As varizes dos membros inferiores são situação muito frequente causando problemas aos doentes e ao SNS. A cirurgia das varizes é das três mais frequentes cirurgias. As observações do exame eco-Doppler vieram revolucionar o conceito de aparecimento e progressão das varizes dos membros inferiores com reflexo no tratamento das mesmas. As observações do eco-Doppler mostraram a grande veia safena como uma veia interfascial e não superficial, veias varicosas com junção safeno femoral competente, bem como veias varicosas que envolvem somente veias colaterais ou veias colaterais e segmentos da grande veia safena, mas sem um envolvimento descendente progressivo desta veia a partir da juncao com a veia femural. Consequentemente foram definidos dois padrões principais de refluxo venoso: o refluxo axial com envolvimento contínuo descendente da grande veia safena desde a junção safenofemoral ao maléolo e o refluxo segmentar com envolvimento de segmentos da grande veia safena e/ou veias colaterais, mas sem continuidade descendente da GVS. O padrão de refluxo segmentar surge na nossa prática clinica com 3 subtipos: no subtipo 1 estão apenas refuxivos ramos superficiais, no subtipo 2 estão envolvidos ramos superficiais e segmentos da grande veia safena, mas sem refluxo descendente continuo da GVS e no subtipo 3 verifica-se refluxo ao nível da junção safenofemoral e de veias colaterais da coxa estando a GVS normal e sem refluxo abaixo da confluência da colateral varicosa. **Objetivo**: Na cirurgia das varizes dos membros inferiores com padrão de refluxo segmentar é possível proceder a simples flebectomias das colaterais varicosas preservando a GVS? ou seja proceder a uma cirurgia menos invasiva com iguais ou melhores resultados que a cirurgia clássica? **Metodologia**: Foram operados 54 doentes com padrão de refluxo segmentar com flebectomia das colaterais varicosas e preservação da grande veia safena. O seguimento clínico considerou o alívio sintomático e resultados cosméticos e a não recorrência de varizes, avaliados pela equipa cirúrgica e os doentes como cirurgia que valeu a pena. O seguimento por eco-Doppler classificou os refluxos segmentares prévios em: desaparecimento, persistência ou progressão para refluxo axial. O tempo médio de seguimento foi de 12,1 meses. **Resultados clínicos**: 98.5% dos doentes avaliaram a cirurgia como positiva. **Resultados do Eco-Doppler**: 58% com ausência de refluxo, *40% com persistência de refluxo e 1 caso (2%) com* ***progressão do refluxo.*** **Conclusão**: Os resultados clínicos e seguimento por eco-Doppler, sustentam como possível a preservação da GVS nos doentes com padrão de refluxo segmentar. A resposta à questão: podemos preservar a GVS quando o refluxo é segmentar ? é um sim podemos. Os nossos achados são também a favor do conceito de que as veias varicosas são um processo local e multifocal com início em qualquer segmento de veias colaterais ou safenas e não um processo descendente do tronco da safena com início na junção safenofemoral. As colaterais varicosas superficiais aparentam ter um papel de actor principal neste processo e não o tronco da veia safena, como considerado no conceito clássico.

Palavras chave: *veias varicosas, grande veia safena, padrões de refluxo, eco-Doppler.*

INTRODUCTION

Study of venous diseases with colour eco-Doppler represents a revolutionary landmark. Ultrasound anatomic visualization of venous structures and colour eco-Doppler functional study of the venous flow changed established concepts somehow consider as dogmatic as well as treatment possibilities.

Anatomic eco-Doppler observations

Colour eco-Doppler as shown clearly that great saphenous vein (GSV) is not a superficial vein, as consider before, but interfascial with their own fascia, the saphenous fascia, and its own compartment, the saphenous compartment. This saphenous fascia is pretty well seen during surgical dissection.

This observation lead to an ultrasound anatomy concept of three venous compartments:[1,2] the superficial compartment containing the superficial venous branches, beeing saphenous collaterals or not, veins with no fascial protection and so the more vulnerable to dilatation and tortuosity, the new saphenous compartment between the saphenous fascia and the muscle aponeurosis and containing the GSV and the deep compartment under the muscle aponeurosis containing the deep veins (fig. 1).

Functional eco-Doppler observations

Three relevant and unexpected observations:

Saphenofemoral junction (SFJ) is competent in around 50 % of patients with varicose veins.[3,4,5]

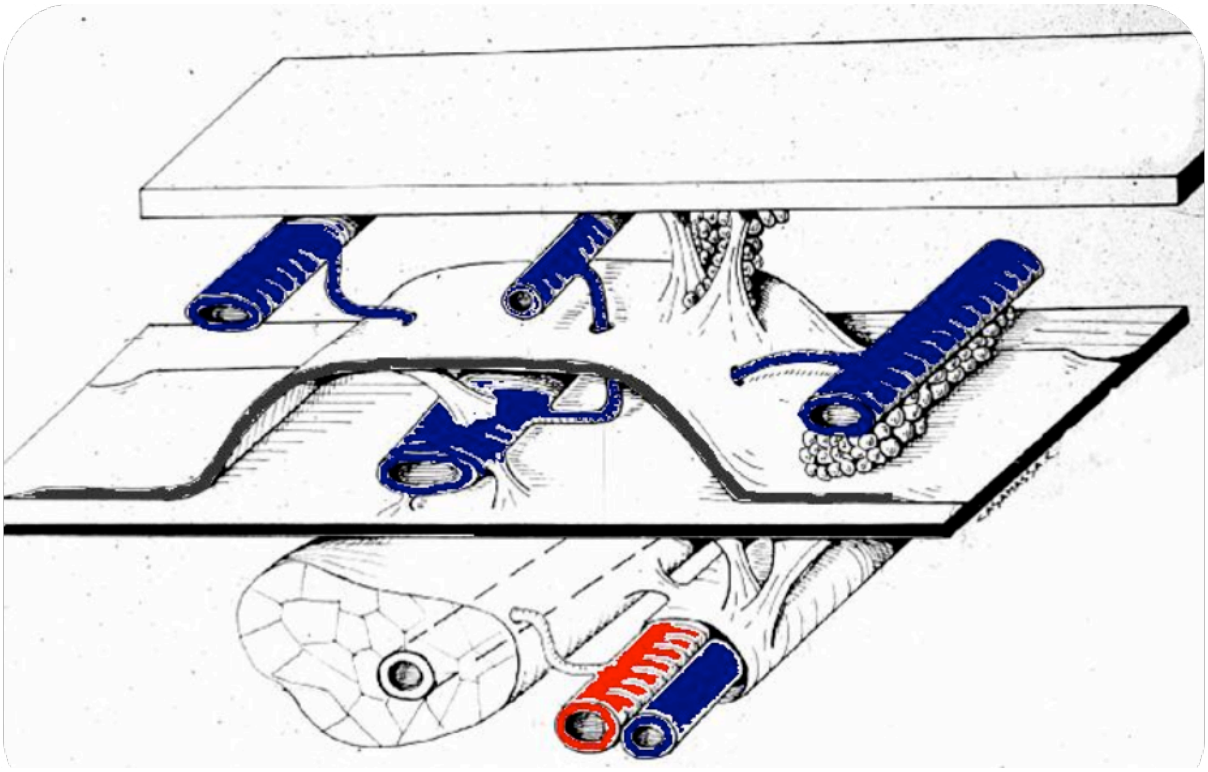

Figure 1 – **Ecoanatomic venous compartments : superficial, saphenous interfascial and deep.**

Varicose veins with refluxive segments of the great saphenous vein but not a continuous descending involvement.

Varicose veins just involving superficial venous branches with a normal saphenous vein.

These colour eco-Doppler observations were the base of different reflux venous patterns[6,7] with a recent classification presented by a transatlantic consensus group, The Vein Term Consensus 20098, considering two main patterns of reflux: the axial reflux, that is a continuous reflux of the great saphenous vein from the groin to malleolus, and the segmental reflux involving localized venous segments with no continuity. (fig. 2)

In our clinical practice this pattern of segmental reflux presents with three main subtypes9: subtype 1, where just superficial branches are varicose and refluxive, subtype 2 with superficial varicose veins and refluxive segments of great saphenous vein with no continuity and subtype 3 with incompetent saphenofemoral junction and tight varicose collaterals but a competent saphenous trunk below the entrance of the collateral (fig. 3, 4, 5).

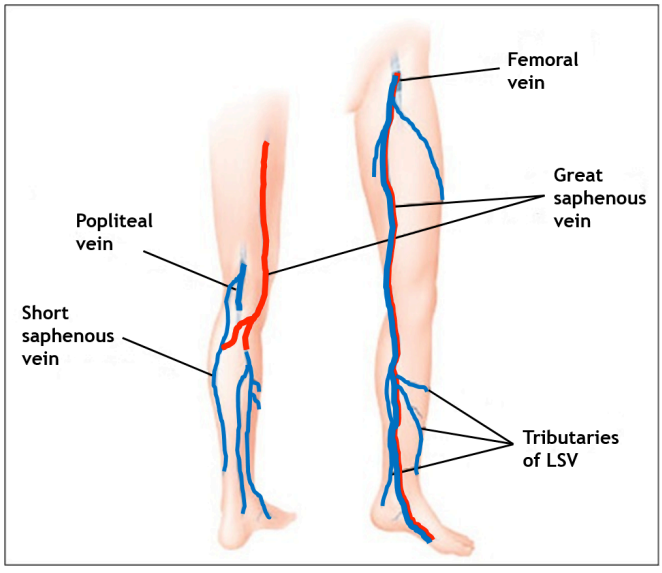

Figure 2 – **Axial reflux: continuous from groin to malleolus**

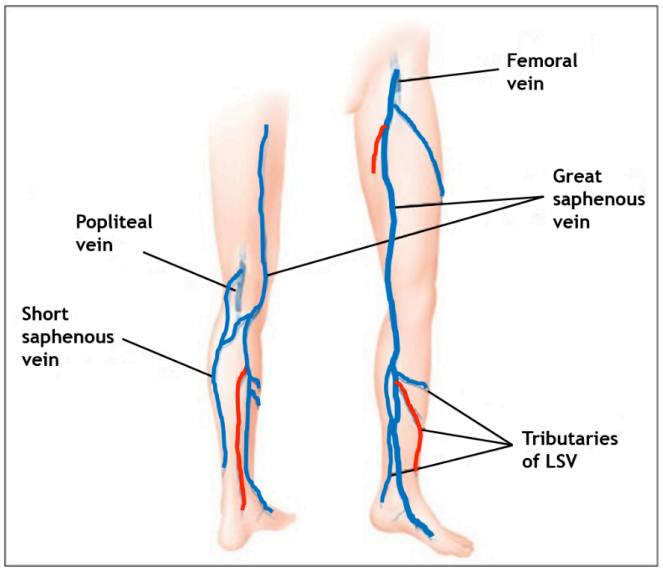

FIGURE 3 – Segmental reflux, subtype 1: just collaterals, superficial branches

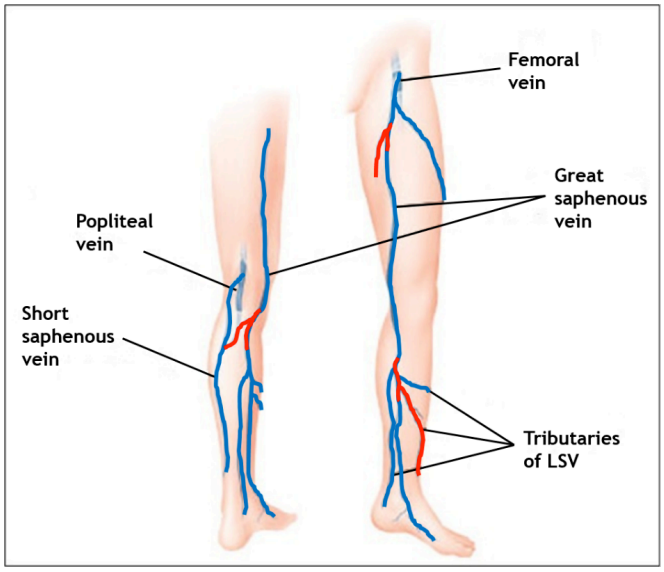

FIGURE 4 – Segmental reflux, subtype 2: collaterals plus saphenous segments

These unexpected colour *eco-Doppler* observations changed concepts of start and evolution of varicose veins and raised an important question in terms of varicose veins treatment:

What to do with varicose veins with segmental involvement of the GSV?

Can we preserve the GSV?

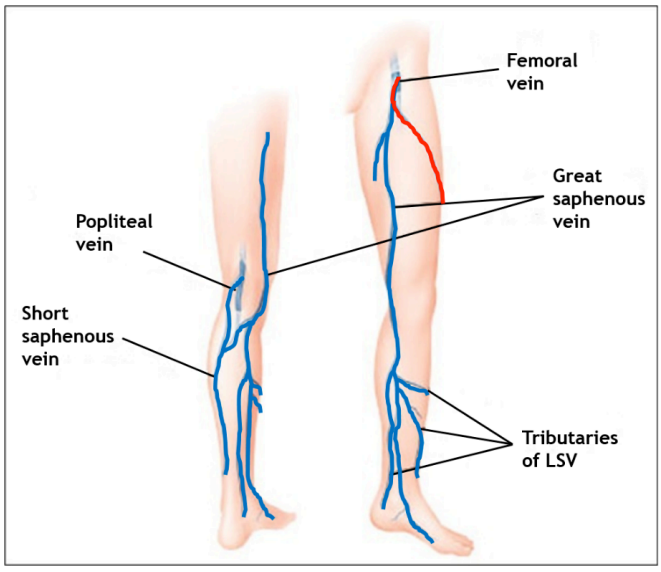

FIGURE 5 – Segmental reflux, subtype 3: reflux of saphenofemoraljunction plus tigh collaterals

AIM OF THE STUDY

Answer the question of preservation of the GSV, when treating varicose veins with a segmental pattern of reflux, with a clinical and eco-Doppler study .Is this possible with equal results as with classic surgery? Of course to preserve GSV when this is not pathological is well accepted, but can we preserve GSV when the involvement of the saphenous trunk is not a progressive descending one?

METHODOLOGY

Clinical and colour eco-Doppler follow-up of 54 lower limbs varicose veins with segmental pattern of reflux operated on with preservation of the GSV.

Distribution by sex, age and clinical CEAP classification.

Clinical history, examination and surgical procedure done by the same surgeon.

Pre and post-operative colour eco-Doppler according to UIP guidelines.

Clinical follow-up done by the surgical team and considering symptomatic relieve, cosmetic results and

no recurrent varicose veins, perceived by the patient as worthwhile surgery.

Follow-up colour eco-Doppler report as: no reflux or no significant reflux of GSV (less than 0,5 sec.), maintenance of previous reflux or progression of previous reflux.

RESULTS

Sex: 42 females and 12 males.

Age: 22 to 77 with a mean age of 52,7 years.

CEAP clinical class: 37 patients were class C 2, 12 patients were class C 3 and 5 patients were class C 4.

Distribution of segmental reflux patterns according to our classification: 32 limbs were subtype 3, 14 limbs were subtype 2 and 8 limbs subtype 1. (fig. 6)

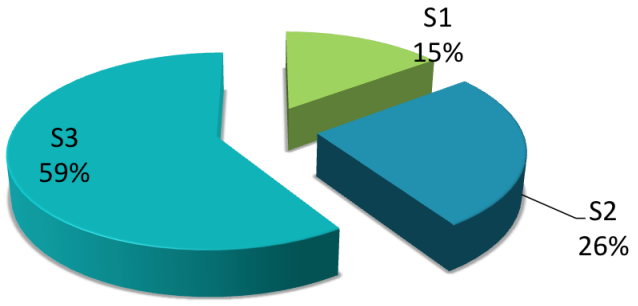

Figure 6 – **Segmental reflux distribution**

Worthwhile surgery consider by 95,5% of the patients.

Recurrent varicose veins in 1 patient after 11 months.

Colour eco-Doppler post-operative findings: no reflux or no significant reflux of GSV in 59% of the limbs, maintenance of previous GSV reflux in 39%, progression of reflux in 2% (one limb). (Fig 7)

Follow-up time: 1 month to 3 years with a mean follow-up of 12,1 months.

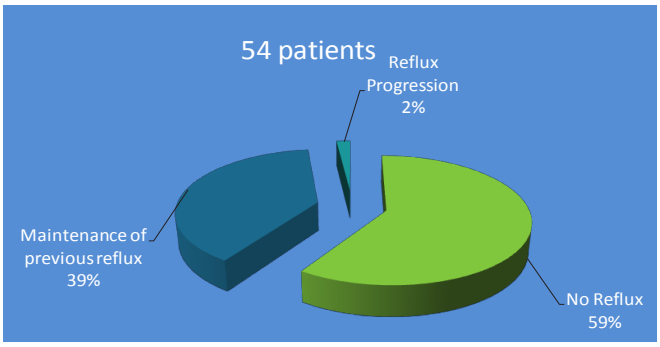

Figure 7 – **Results of eco-Doppler follow-up**

DISCUSSION

In line with previous studies[10,11,12,13] our selective less invasive modern surgery with preservation of the GSV, when the involvement of this vein was segmental was followed by no reflux or non-significant reflux in 54% of the cases after a mean follow-up of 12,1 months.

In Pitalluga serie this was observed in 2/3 of the cases after a mean follow-up of 32,4 months as well as a significant reduction of the GSV diameter (we have not study this item). This reduction of GSV diameter after ablation of distal incompetent tributaries was also observed by Creton.

Zamboni mention reflux elimination without any ablation or disconnection of the saphenous vein.

These studies as shown that a hemodynamic reversibility of the GSV reflux is observed when the involvement of GSV is segmental.

Possible explanations of this fact could be the increase velocity of the antegrade venous flow due to ablation of the varicose superficial veins (varicose reservoir) with a positive effect on the closure valvular pression[14] and the elimination of the aspirative syphon effect of the dilated varicose branches on the GSV venous flow.[15]

Another interesting observation to highlight is the fact that after endovenous treatment, despite the obliteration of the GSV took place some cm below the junction leaving one or more collaterals, these

collaterals show a pos-treatment normal venous flow questioning the previous essential importance of flush ligation.

Clinical results resulting in a very positive patient opinion as a worthwhile surgery (95,5%) are very good and compares to Pitalluga study with a symptomatic relieve of 84,2 to 78,0% after 6 months and 4 years and an aesthetic improvement of 93,6 to 89,9%.

Respecting recurrent varicose veins, although our mean follow-up is short (12,1 months) our results (2%) compares with the frequency rates after classical surgical surgery or endovenous treatment.[16,17,18]

In fact, no treatment of varicose veins avoid the risk of recurrent varicose veins and still we do not have valid indicators to foresee this risk in individual patients, reason why we are in favour of an yearly based follow-up of the patients operated on, preferentially by the surgeon itself, to assess their results, having in mind we are dealing with a chronic progressive disease.

We consider that these colour eco-Doppler findings of reflux patterns supports biochemical and anatomopathological data[19,20] that varicose veins are essential due to an inherited parietal weakness that with time lead to venous dilatation, according to eco--Doppler findings this dilatation can start in any vein, more frequently in superficial veins probably due to is lack of fascial protection and progress in an ascending and descending way as in out-in from collaterals to saphenous veins, or in-out from the saphenous veins to collaterals.[21,22]

This parietal weakness also makes ease to understand the role of venoactive drugs in terms of venous tonicity and anti-inflammatory effect and elastic stocks, acting as an external fascia, in terms of increasing venous flow velocity.

We have to stress that this selective modern surgery with preservation of the GSV imply a complete colour eco-Doppler study of the GSV from groin to malleolus to classify the pattern of reflux as axial or segmental.

CONCLUSIONS

Surgery of varicose veins of lower limbs with a segmental reflux pattern with preservation of the GSV has shown in our patients good and maintained results with no or no significant reflux in 54% of the cases after a mean follow-up of 12,1 months and a good clinical response.

The answer to our question "*Can we preserve great saphenous vein*?" is a positive "*Yes we can*".

Our findings, correlate with others, corroborate the concept that varicose veins appear as a local and multifocal process that could start at any vein with up or down and out-in or in-out progression and not a progressive descending process starting at the saphenofemoral junction as considered before and highlight the importance of the so called varicose superficial reservoir as a central one in varicose veins opposing to the central role of the saphenous trunk as before.

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