Surgical crossectomy and saphenic trunk sclerotherapy.

Preliminary results of a combined approach to the treatment of saphenous vein varices

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AIM: *Here our proposal of a new approach to the incontinent saphenous-femoral junction (SFJ) based on the combination of surgery and sclerotherapy for treatment of incontinent varices. It is a two-step procedure with a surgical ligation and transection of SFJ followed by a sclerosis of saphenous trunk and extra-fascial tributaries.*
MATERIALS AND METHODS: *From January to December 2017, 95 patients (63 females and 32 males) with a mean age of 56.43 ± 6.07 years for a total of 121 limbs were treated with the SHSC approach.*
Under local anesthesia, after surgical selective hemodynamic crossectomy and a retrograde cannulation of the saphenous trunk by means of 8-10 ch nelaton-like catheter, 0.5-1% polydocanol foam, obtained with Tessari's technique, is injected into the vein. During injection, the catheter must be progressively withdrawn, so that the entire vein comes in contact with the foam.
RESULTS: *121 limbs have been treated with the above technique. A complete obliteration of the saphenous trunk was observed after 116 (95.86%) treatments in the immediate postoperative time. With regard to collateral veins sclerosis, 99 (81.81%) complete obliterations were observed. 28 (23.14%) collateral varices had to be refined by sclerotherapy.*
DISCUSSION: *SHSC associates the execution of a selective hemodynamic crossectomy with an intraoperative foam sclerotherapy for the treatment of the saphenous trunk and collateral varicose veins. SHSC, compared to classical US-guided foam sclerotherapy seems to be safer, with fewer risks of pulmonary and / or cerebral embolic complications. SHSC prevents blood wash out which could destabilize the consolidation of the saphenous trunk sclerosis.*
CONCLUSIONS: *SHSC can be considered an effective treatment of varicose veins, simple to perform, minimally invasive and well tolerated*

KEY WORDS: Crossectomy, Saphenous vein, Sclerotherapy, SFJ

Introduction

The paper we present is inspired by the already achieved results in the hemodynamic treatment of saphenous vein varices and proposes a multi-stage approach to their ablation, the "selective hemodynamic sclero-crossectomy" (SHSC).
The emodynamic principles remain the same: what changes is the way of treating the saphenous-femoral junction, the saphenous trunk and the saphenic varices. The purpose of this different approach lies in the need to fit the timing of selective hemodynamic saphenous vein ablation to those of the theatre, reducing time to the minimum without sacrificing the validity of the treatment. Moreover, this approach stems from the need to guarantee to the patient a minimally invasive treatment, with a consequent faster recovery time and a better aesthetic results.

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W. Hach was the precursor of the haemodynamic ablative surgery. 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 or small saphenous vein, but it was possible to perform a limited excission, or ligation, or a ligation-interruption of perforating veins. W. Hach developed an anatomical and functional classification of varicose disease (H1, H2, H3, H4), and indicated a surgical strategy that today is fully confirmed in Doppler ultrasound studies.
The haemodynamic surgical ablation includes, in the specific case of great saphenous vein varices:
– selective crossectomy with upper tributaries sparing (if possible [1,2]);
– (Hach 1 stage) stripping of the accessory saphenous systems;
– or (Hach 2 stage) ultra-short stripping of the great saphenous vein, from saphenous-femoral junction to the middle third of the lower leg;
– or (Hach 3 stage) short stripping of the great saphenous vein, from saphenous-femoral junction to the upper third of the leg;
– or (Hach 4 stage) long stripping of the great saphenous vein, from saphenous-femoral junction to the medial malleolus.
(In case of small saphenous vein, it includes: stripping of the external saphenous vein, from the saphenous-popliteal junction to lateral malleolus or, more frequently, mid-calf (short stripping)
– Varicectomy;
– Review of the SF junction;
– Ligation and transection of perforator veins, to complete the ablation of the saphenous trunks[3].

All the principles mentioned above are still respected in SHSC: the advantage of our approach is the treatment of the Saphenous-Femoral or Saphenous-Popliteal junction which continues to be surgical whilst saphenous vein trunk and varices treatment is managed by means of foam sclerotherapy. If the origin of varicosis is a refluxing point represented by an insufficient perforator vein [4], the latter will be surgically treated and sclerotherapy will be completed.

Materials and Methods

From January to December 2017, 95 patients (63 females and 32 males) with a mean age of 56.43 ± 6.07 years for a total of 121 limbs were treated with the SHSC approach. The average follow-up time was 10.54±3.68 months (for a minimum of 5 and a maximum of 17 months). All patients were selected in the Outpatient Vascular Diagnostic Service at "A. Tortora" Hospital, Pagani - Salerno - Italy. After a preoperative ultrasound mapping, the patients were treated.
A local anesthesia is performed, through a 10 ml mepivacaine hydrochloride (diluted with 20 ml saline and bicarbonate) inguinal infiltration, in case of treatment of the great saphenous vein system.
The selective hemodynamic crossectomy of the saphenous-femoral junction consists of the isolation and the preserving of the upper tributaries, ie the superficial epigastric, the supeficial circumflex iliac and the external pudenda veins, while the inferior ones, ie (usually) the anterior-lateral and the posterior-medial veins, once recognized, are disconnected together with the great saphenous vein.
After surgical time, we proceed to retrograde cannulation of the saphenous trunk by using a 8-10 ch nelaton-like catheter.
Retrograde cannulation is done up to the extreme distal valve, previously marked with a dermographic marker during the preoperative duplex-US study.
Before proceeding with sclerotherapy, saphenous vein trunk is filled up with saline eliminating as much blood as possible from the vein.
Successively, the limb is raised approximately to 45° and then, from 4 to 8 cc (depending to the lenght of the saphenic trunk) of 0.5-1% polydocanol Tessari's [5] foam, is injected into the catheter.
During injection, the catheter must be progressively withdrawn, so that the entire vein comes in contact with the foam.
The evidence of a local vasospasm suggests that the foam has filled the saphenic varices.
At the end of the operation a suture of groin or popliteal fossa is performed and an eccentric compression with padded gauzes, self-adhesive bandage and a II class elastic mono-collant are applied and kept in situ for 1 week.
Post-procedural inflammed or coagulated vein traits were found. These side effects, in the first instance, were managed conservatively by the topical application of heparinoid; if the conservative approach did not result, a direct drainage of the coagulum (suction with syringe or micro-incision) has been done.

Results

121 limbs have been treated with the above technique. 93 procedures were performed on internal and collateral saphenous veins, 19 on external and collateral saphenous veins and 9 on refluxing perforator veins.
A complete obliteration of the saphenous trunk was observed after 116 (95.86%) treatments in the immediate postoperative time. With regard to collateral veins sclerosis, 99 (81.81%) complete obliterations were observed. During follow-up, 112 (92.55%) complete obliterations of the saphenous trunk (both internal and external) and 85 (70.24%) obliterations of saphenic varices were found. Truncular recurrencies were not considered clinically symptomatic. 28 (23.14%) collateral varices had to be refined by sclerotherapy (both foam and liquid sclerotherapy).

In addition, 39 episodes of inflammation were found, of which 31 completely resolved with conservative therapy.

Discussion

SHSC is a technique developed, in first instance, for the treatment of varicose veins caused by the incontinence of the saphenous-femoral junction and great saphenous vein trunk[6], but it can also performed in the varicose veins of the sapheno-popliteal junction, and in other situations where a refluxing point is clear.
It joins surgical interruption of the saphenous-femoral or saphenous-popliteal junction, with the execution of a selective hemodynamic crossectomy, while the treatment of the saphenous system is performed with an intraoperative foam sclerotherapy [7,8,9].
The preoperative ecocolordoppler study is mandatory for the correct planning and execution of the proposed technique. For this reason, the examination must be strictly done in orthostatism by means of static and dynamic maneuvers [10,11].
It allows to evaluate the functionality of the SFJ (with particular attention to pre-terminal and terminal valves) and femoral vein valvular apparatus (proximal and distal valves), flow direction, refluxes and retrograde flows, as well as the identification of anatomical variants [12].
SHSC, compared to classical US-guided foam sclerotherapy, according to the results of this preliminary study seems to be safer, with fewer risks of pulmonary and / or cerebral embolic complications in case of atrial septal defect, due to the preventive vein isolation after selective crossectomy.
US-guided foam sclerotherapy definitely and inevitably keeps a long saphenous stump which could expose to possibility of recurrence, especially in case of large calibers and high flow refluxes.
Although it has been shown that the effectiveness of endovascular techniques such as Laser and Radiofrequency, is equal to surgery (in terms of recurrence [13-15]), they allow a lower possibility of handling not-anatomical patterns which represent the main condition of recurrence.
SHSC, moreover, lowering the pressure in distal (anatomically speaking) veins, the interruption of SFJ/SPJ reflux [16] allows an effective compression and prevents the wash out which could destabilize the consolidation of the saphenous trunk sclerosis.
There are many advantages treating varicose veins with SHSC technique:
– outpatient setting procedure;
– lower incidence of paresthesias, bleeding and haematomas;
– no spinal anesthesia;
– no tumescent anesthesia with multiple injections;
– rapid recovery with immediate discharge and return to social life;
– short time procedure (about 30 minutes);
– low cost (no use of device);
– excellent aesthetic effect [17].

Conclusions

SHSC can be considered an effective treatment of varicose veins, simple to perform, minimally invasive, well tolerated by patients, which can be performed in an outpatient setting in a short time, with similar results to traditional surgery and other methods. but with less complications.

Riassunto

Il lavoro che presentiamo riporta la nostra esperienza circa un nuovo approccio alla giunzione safeno-femorale incontinente basata sulla combinazione di chirurgia e scleroterapia per il trattamento delle varici incontinenti. Si tratta di una procedura in due fasi con legatura chirurgica e transezione della giunzione safeno-femorale seguita dalla sclerosi del tronco safenico e delle affluenti extra-fascali.
Da gennaio a dicembre 2017, 95 pazienti (63 femmine e 32 maschi) con un'età media di 56.43 6.07 anni per un totale di 121 arti sono stati trattati con l'approccio della sclero-crossectomia emodinamica selettiva
Dopo l'intervento chirurgico di crossectomia emodinamica In anestesia locale e una cannulazione retrograda del tronco safenico mediante catetere 8-10 ch nelaton, la schiuma di polidocanolo 0,5-1%, ottenuta con la tecnica di Tessari, viene iniettata nella vena. Durante l'iniezione, il catetere deve essere progressivamente estratto, in modo che l'intera vena entri in contatto con la schiuma.
121 arti sono stati trattati con la tecnica illustrata. È stata osservata una completa obliterazione del tronco safenico in 116 trattamenti (95,86%) già a partire dall'immediato postoperatorio. Per quanto riguarda la sclerosi delle vene collaterali, sono state osservate 99 obliterazioni complete (81,81%). 28 varici collaterali (23,14%) hanno necessitato di *finissage* scleroterapico.
La sclero-crossectomia emodinamica selettiva associa l'esecuzione della crossectomia emodinamica selettiva con una *foam sclerotherapy* intraoperatoria per il trattamento del tronco safenico e delle collaterali varicose. Rispetto alla classica foam sclerotherapy eco-guidata, sembra essere più sicura, con minori rischi di complicanze emboliche polmonari e / o cerebrali. La crossectomia Impedisce il wash-out del sangue che potrebbe inficiare il consolidamento della sclerosi del tronco safenico, per cui la tecnica proprosta può essere considerata un trattamento efficace delle vene varicose, semplice da eseguire, minimamente invasivo e ben tollerata.

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