Riviera Veine Institut

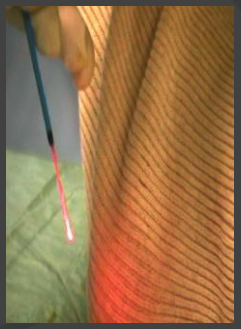
Nice (France), Monaco

Does varicose veins surgery have a future ?

P. Pittaluga, S. Chastanet

Increasingly competitive techniques in front of High-ligation and stripping

- **Endovenous thermal ablation :**
  - **Radiofrequency**
  - **Endovenous Laser**



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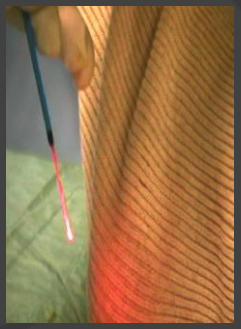

→ **Similar midterm results**

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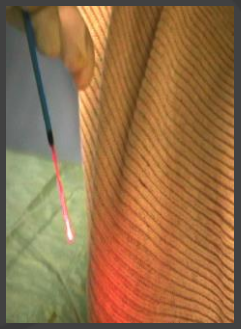

→ **Similar midterm results**

→ **Less side effects**

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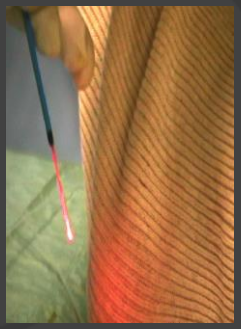

→ **Similar midterm results**

→ **Less side effects**

High-ligation and stripping should not be considered as the gold standard nowadays

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

Peter Gloviczki, MD,[a] Anthony J. Comerota, MD,[b] Michael C. Dalsing, MD,[c] Bo G. Eklof, MD,[d] David L. Gillespie, MD,[e] Monika L. Gloviczki, MD, PhD,[f] Joann M. Lohr, MD,[g] Robert B. McLafferty, MD,[h]

JOURNAL OF VASCULAR SURGERY
Volume 53, Number 16S

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Guideline No.	*10. Open venous surgery*	*GRADE of recommendation*	*Level of evidence*
		1. Strong 2. Weak	A. High quality B. Moderate quality C. Low or very low quality
10.1	For treatment of the incompetent great saphenous vein, we suggest high ligation and inversion stripping of the saphenous vein to the level of the knee.	2	B

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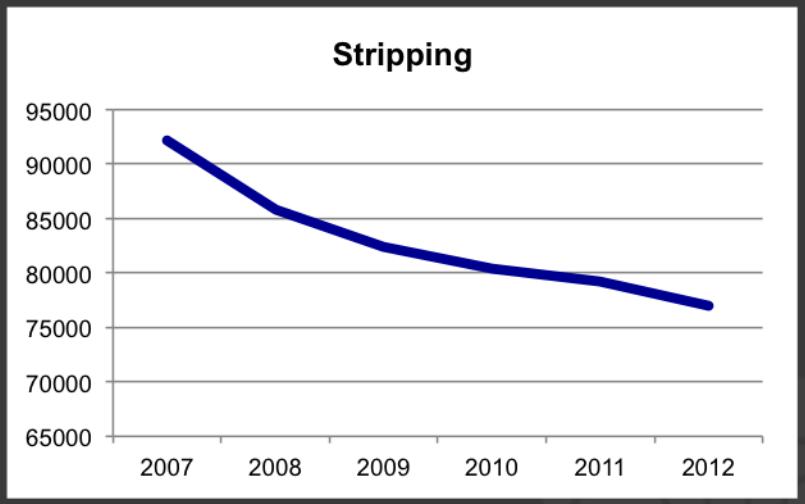
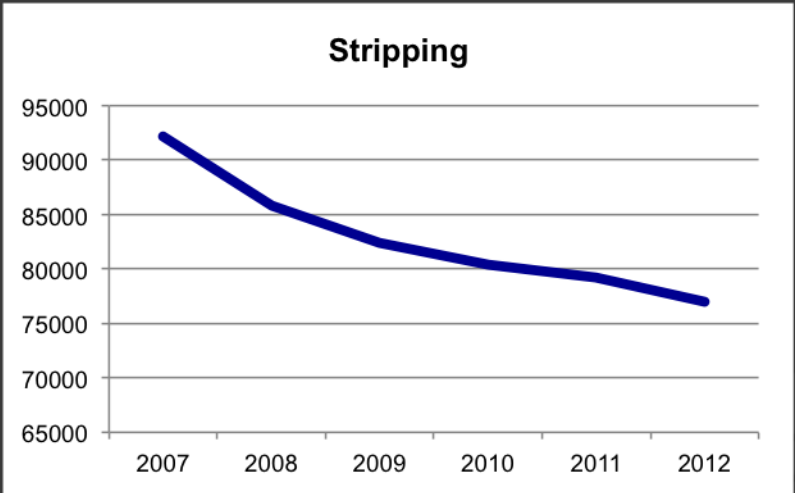
Guideline No.	*11. Endovenous thermal ablation*	*GRADE of recommendation*	*Level of evidence*
		1. Strong	A. High quality
		2. Weak	B. Moderate quality
			C. Low or very low quality
11.1	Endovenous thermal ablations (laser and radiofrequency ablations) are safe and effective, and we recommend them for treatment of saphenous incompetence.	1	B
11.2	Because of reduced convalescence and less pain and morbidity, we recommend endovenous thermal ablation of the incompetent saphenous vein over open surgery.	1	B



Evolution in France

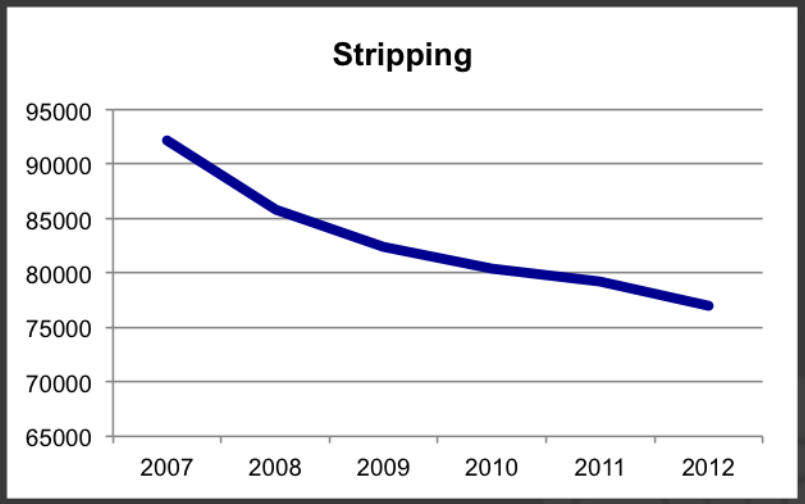


Evolution in France

2007-2012 :

- **- 20% stripping**
- **+ 12 000 RF + EVLT**

Despite the absence of reimbursement for endovenous techniques



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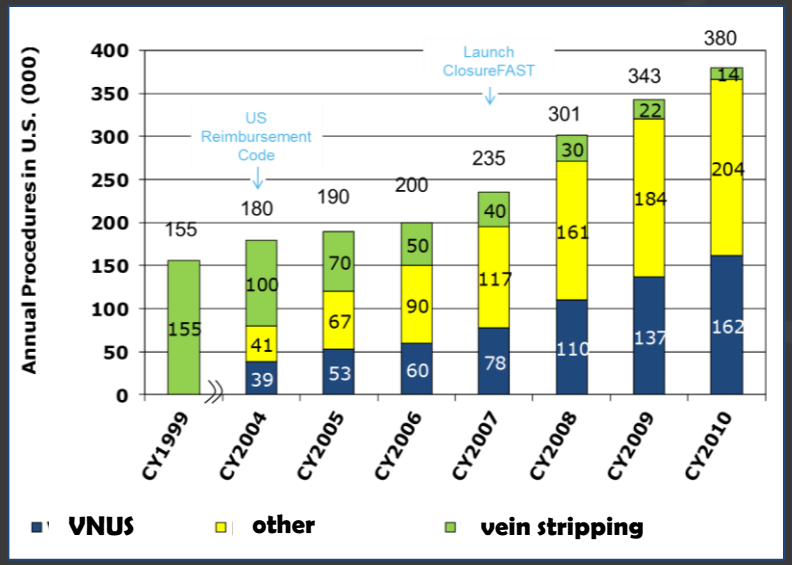
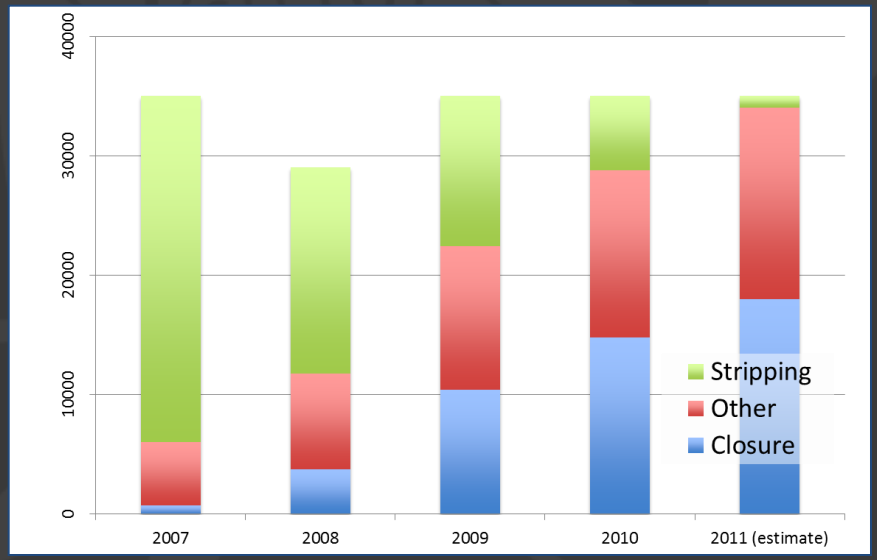


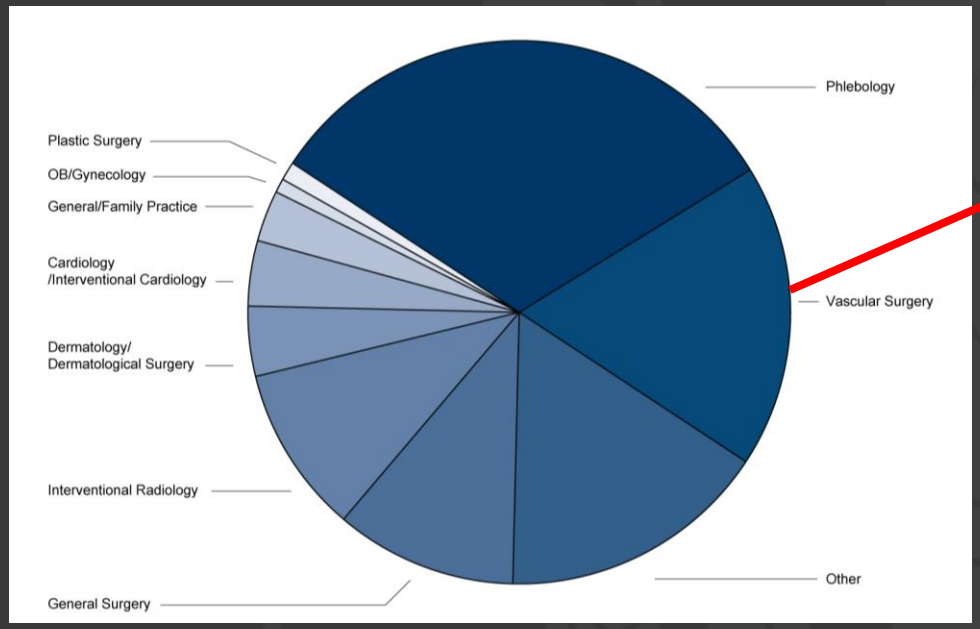
Evolution in USA



Evolution in Netherland

This evolution is felt as a serious threat by vascular surgeons

This evolution is felt as a serious threat by vascular surgeons



18% vasc surg

US Physicians specialties performing varicose veins treatment in 2011


Think different.

Endovenous techniques: New deal

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- **New strategy of treatment** (new pathophysiol. approach)
- **New handling** (new technical approach)

Endovenous techniques: New deal

- **New strategy of treatment** (new pathophysiol. approach)
- **New handling** (new technical approach)

→ **Must force surgery to make its revolution**

What did we learn from endothermal ablations?

1) New physiopathological approach

Endothermal ablation: no high-ligation preservation of the junction

TABLE 66.II. – *Absence of reflux of the sapheno-femoral junction (SFJ) after saphenous ablation by radiofrequency (RF), endovenous laser (EVL) or stripping without crossectomy (SWC).*

AUTHOR	YEAR OF PUBLICATION	N	FOLLOW-UP	TECHNIQUE	ABSENCE REFLUX JSF
Pichot [9]	2004	104	2 y	RF	95.2%
Merchant [10]	2005	406	5 y	RF	83.8%
Nicolini [11]	2005	68	3 y	RF	88%
Min RJ [12]	2003	121	2 y	EVL	93.4%
Proebstle T [13]	2006	188	1 y	EVL	95.7%
Casoni [1]	2008	62	4 y	SWC	98.4%
Pittaluga [14]	2008	195	2 y	SWC	98.2%

Pittaluga P, Chastanet S. Incontinence of the GSV: hemodynamic concepts and their therapeutiic consequences. In Becquemin JP ed. Updates and controversies in vacular surgery. Torino: Minerva medica 2010, 401-408

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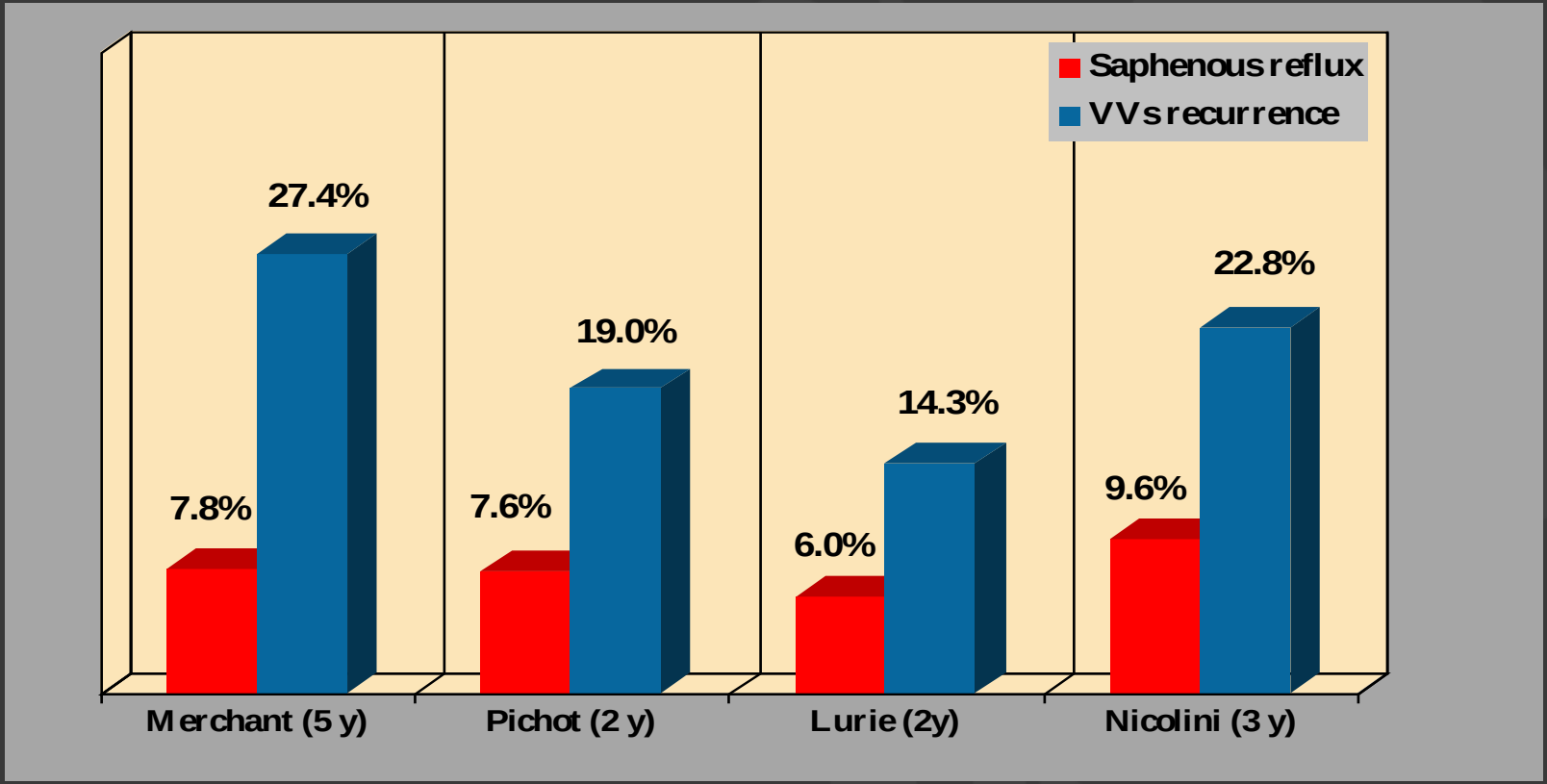
High-ligation is not necessary for the abolition of the reflux at the junction

Endothermal ablations: recurrence / saphenous obliteration



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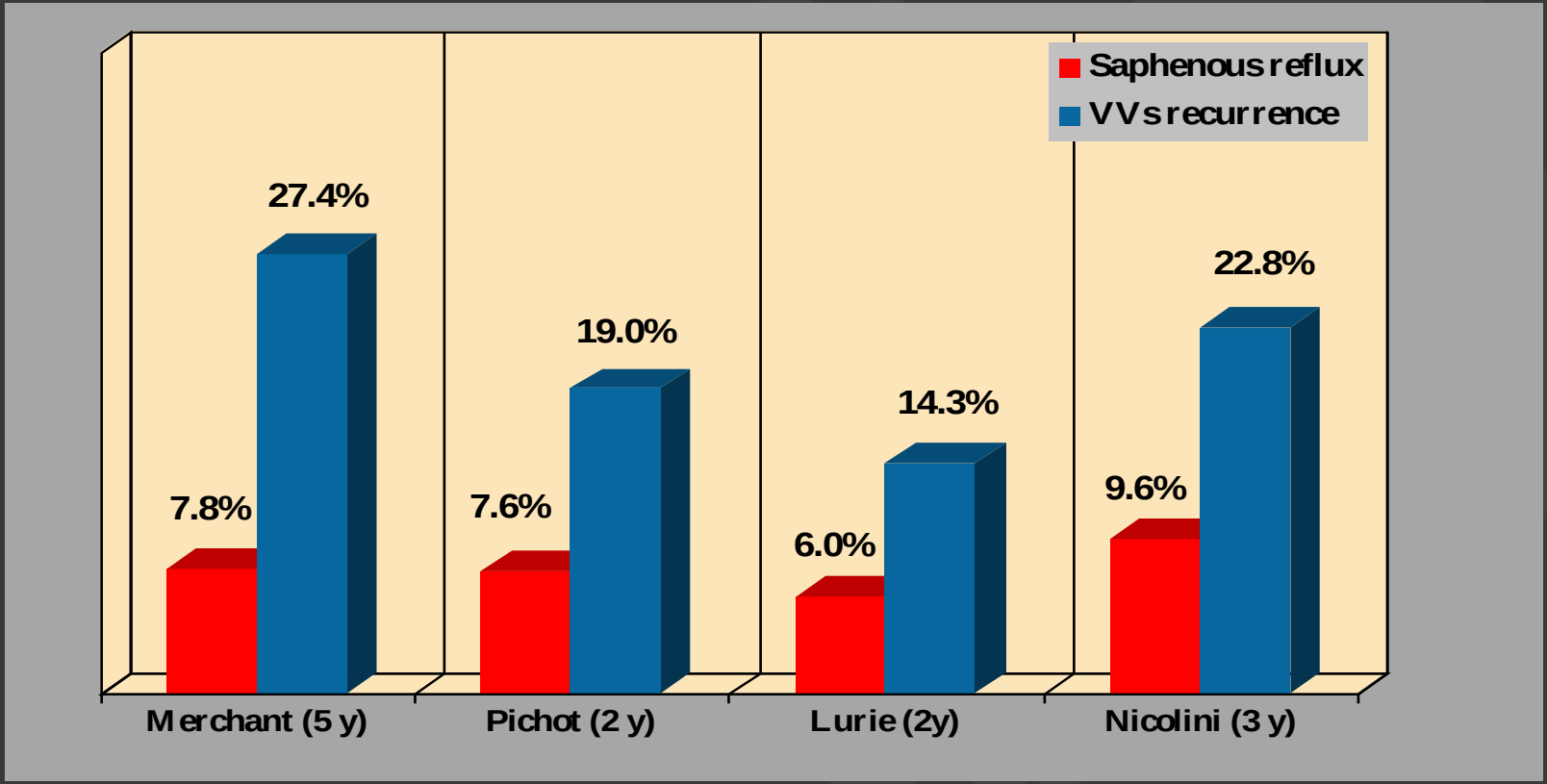

50% of the recurrence appeared despite the abolition of the saphenous reflux

High-ligation is not necessary for the abolition of the reflux at the junction

50% of the recurrence appeared despite the abolition of the saphenous reflux

Increasing evidences for the ascending evolution theory

Study of the venous reflux progression

Nicos Labropoulos, PhD, DIC, RVT, Luis Leon, MD, Sung Kwon, MD, Apostolos Tassiopoulos, MD, José A. Gonzalez-Fajardo, MD, Steven S. Kang, MD, M. Ashraf Mansour, MD, and Fred N. Littooy, MD, *Maywood, Ill*

J Vasc Surg 2005;41 291-5.

Patterns of saphenous reflux in women with primary varicose veins

Carlos Alberto Engelhorn, MD, PhD, Ana Luiza V. Engelhorn, MD, MS, Maria Fernanda Cassou, MD, and Sergio X. Salles-Cunha, PhD, RVT, *Curitiba, Paraná, Brazil*

J Vasc Surg 2005;41:645-51.

Age-related variations of varicose veins anatomy

Alberto Caggiati, MD, PhD, Caterina Rosi, BSc, Rosemarie Heyn, VMD, PhD, Marco Franceschini, MD, and Maria Cristina Acconcia, MD, *Rome, Italy*

J Vasc Surg 2006;44:1291-5.

Development of Primary Superficial Venous Insufficiency: The Ascending Theory. Observational and Hemodynamic Data From a 9-Year Experience

Eugenio Bernardini,[1] Paola De Rango,[2] Riccardo Piccioli,[1] Carlo Bisacci,[1] Valentino Pagliuca,[1] Giuseppe Genovese,[1] and Roberto Bisacci,[1] Perugia, Italy

Annals of Vascular Surgery Vol 24 No 6 August 2010

These data are in accordance with the progression of venous disease where reflux advances from the tributaries and accessory saphenous veins to the saphenous trunks or develops in new locations.

Nicos Labropoulos The distribution and significance of varicosities the saphenous trunks J Vasc Surg 2010;51:96-103

New strategy for the surgical treatment

- **More targeted surgery :**
  - **Calling into question the systematic high-ligation**
  - **Calling into question the systematic saphenous ablation**

Preservation of the junction during stripping

Great saphenous vein stripping with preservation of sapheno-femoral confluence: Hemodynamic and clinical results

Paul Pittaluga, MD,[a] Sylvain Chastanet, MD,[a] and Jean-Jérôme Guex, MD,[b] *Nice, France*

Background: Radiofrequency and laser vein treatment, which entail preservation of the saphenous confluence, have called into question the dogma of ligation of all tributaries at the sapheno-femoral confluence (SFC), so called "crossectomy". Nevertheless, crossectomy is still done when saphenous vein stripping is chosen for varicose vein treatment. The purpose of this study was to evaluate results after stripping procedures in which the SFC was preserved.
Methods: This was a retrospective cohort study for which limbs treated for varicose veins by surgical stripping of the great saphenous vein and preservation of the SFC were studied. All limbs had a preoperative duplex examination and showed SFC and truncal incompetence of the great saphenous vein. Periodic postoperative standing duplex ultrasound and clinical examinations were carried out, and results were recorded and analyzed retrospectively.
Results: A total of 195 lower limbs were operated on in 151 patients (128 women and 25 men) aged from 22 to 88 years (mean age 56.8). The preoperative diameter of the SFC ranged from 4.7 to 17 mm (mean 9.5 mm). The preoperative CEAP class distribution was C1 1.5%, C2 82.1%, C3 6.7%, and C4-C6 9.7%. Preoperative symptoms were present in 61.8% of cases. Postoperative thrombosis of the SFC was observed in one case with an extension to the deep femoral vein and pulmonary embolization at 1 month. Recovery was complete. At a mean of 24.4 months postoperatively (median 27.3 months, range 8 to 34.8), persistent SFC reflux was observed in only two cases (1.8%) and a SFC neovascularization in one case (0.9%). Recurrence of varicose veins appeared in seven cases (6.3%) but in conjunction with SFC reflux in only one case. Post treatment 83.9% of limbs were converted to CEAP clinical class 0 to 1 and significant symptom improvement was observed in 91.3% of cases with an aesthetic benefit in 95.5%.
Conclusion: Preservation of the SFC during saphenous stripping gave good results with regard to hemodynamics and neovascularization on the SFC, varicose vein recurrence, improvement of symptoms, and aesthetic appearance for legs with a median follow-up of 27.3 months. (J Vasc Surg 2008;47:1300-5.)

2 years :
SFJ reflux 1.8%
Ing. neovascul 0.9%
VVs recurrence 6.8%

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Great saphenous vein surgery without high ligation of the saphenofemoral junction

Paolo Casoni, MD,[a,b] Marc Lefebvre-Vilardebo, MD,[c] Fabio Villa, MD,[a] and Piero Corona, MD,[a,c]
Parma, Italy; Marbella, Spain; and Paris, France

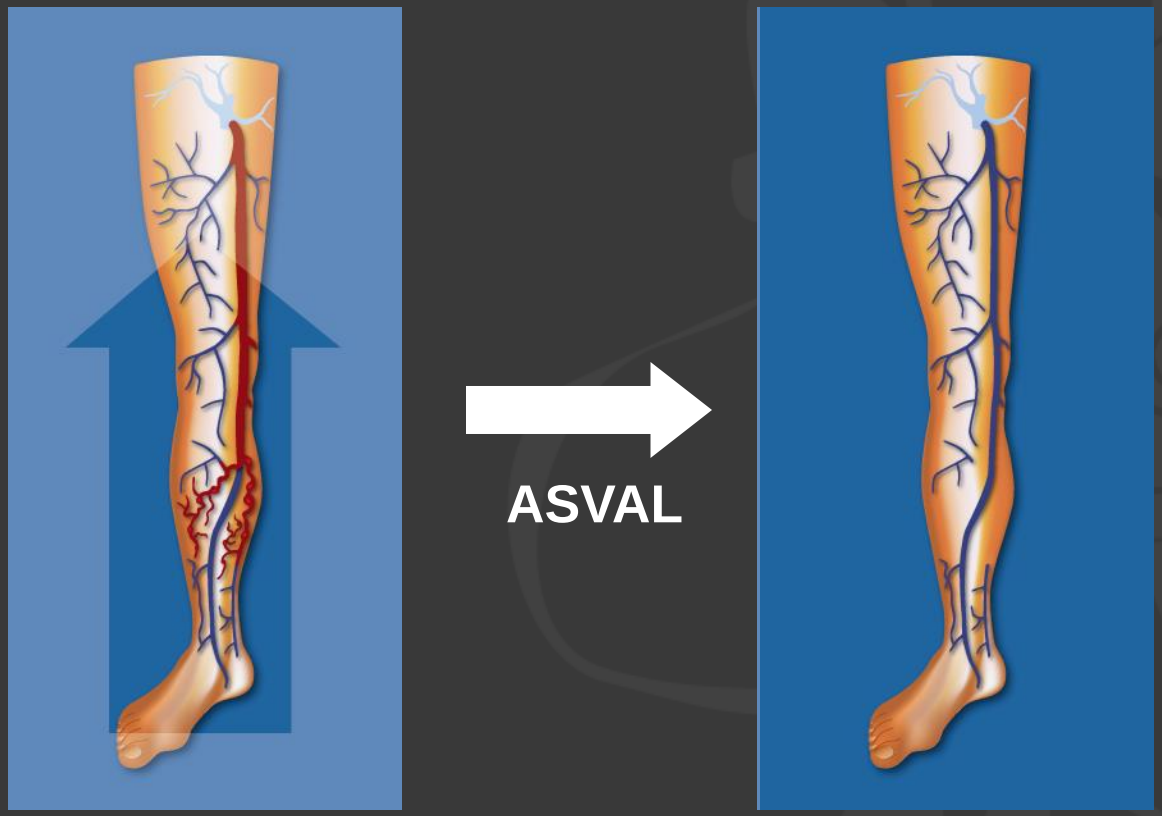
Objective: The aim of this study was to evaluate whether great saphenous vein (GSV) surgery without high ligation of the saphenofemoral junction (SFJ) is beneficial in terms of varicose vein recurrence.
Methods: This was a prospective randomized trial set in a private practice. From December 2000 to May 2004, 120 patients were enrolled. Patients were randomly allocated preoperatively to two groups undergoing GSV surgery with (group A, n = 60) or without (group B, n = 60) high ligation of the SFJ. In four patients (two in each group), both limbs were operated on. Inclusion criteria were primary varicose veins with SFJ incompetence resulting in GSV reflux. Exclusion criteria were age <18 years, inability to give informed consent, associated small saphenous vein incompetence, and prior GSV surgery. Mean follow-up was 8 years and was complete in all but one patient (99.2%). The primary end point was varicose vein recurrence, defined as treated lower limbs with new thigh varices at clinical evaluation (CEAP ≥2) or venous reflux at the thigh or groin level, as assessed by duplex ultrasound imaging.
Results: The follow-up included 123 limbs. The combined clinical and ultrasound-determined recurrence rate was 24.4% (30 of 123): 32.2% (20 of 62) in group A vs 16.4% (10 of 61) in group B ($P = .045$). Postoperatively, recurrence of even minimal varices was observed in 24 limbs (19.5%): 18 of 62 (29.0%) in group A vs six of 61 (9.8%) in group B ($P = .014$). The ultrasound-detected recurrence rate was 22% (27 of 123): 32.2% (20 of 62) in group A vs 11.4% (7 of 61) in group B ($P = .010$). The average time to recurrence was 3.5 ± 1.2 years in group A and 4.1 ± 1.6 years in group B ($P = .258$).
Conclusions: GSV surgery without high ligation of the SFJ is associated with low rates of clinical and ultrasound-determined recurrence of varicose veins. (J Vasc Surg 2013;58:173-8.)

2 years :
SFJ reflux 1.8%
Ing. neovascul 0.9%
VVs recurrence 6.8%

8 years :
No high-lig. > high-lig.
VVs recurrence :
9.8% vs 29% (p=0.014)

Preservation of the saphenous vein:

Ambulatory Selective Varices Ablation under Local anesthesia



ASVAL

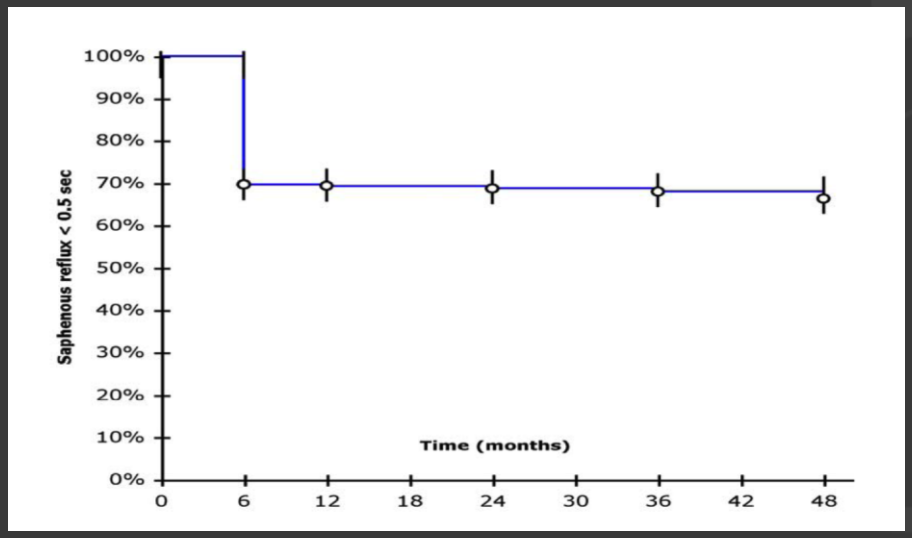
Varices are the cause of the hemodynamic trouble

Preservation of the saphenous vein:
Ambulatory Selective Varices Ablation under Local anesthesia

Midterm results of the surgical treatment of varices by phlebectomy with conservation of a refluxing saphenous vein

Paul Pittaluga, MD,[a] Sylvain Chastanet, MD,[a] Bernard Rea, MD,[b] and Rémy Barbe, PhD,[b]
Nice and Sainte-Foy-lès-Lyon, France

(J Vasc Surg 2009;50:107-18.)



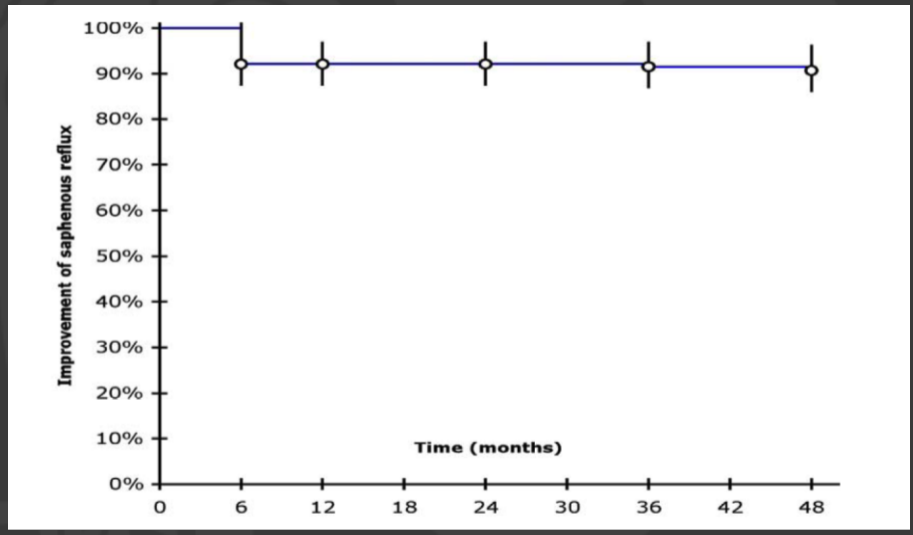


Table II. Evolution of the diameter of the saphenous confluence after ambulatory selective varices ablation under local anesthesia[a]

Variable	*No.*	*Mean SC diameter, mm*		*Reduction, %*	P
		Pre-op	*Post-op (6-mon)*		
Whole cohort controlled	243	7.87 ± 0.25	5.87 ± 0.23	25	<.0001

Preservation of the saphenous vein:
Ambulatory Selective Varices Ablation under Local anesthesia

The effect of single phlebectomies of a large varicose tributary on great saphenous vein reflux

Anke A. M. Biemans, MD, PhD,[a] Renate R. van den Bos, MD, PhD,[a] Loes M. Hollestein, MSc,[a] M. Birgitte Maessen-Visch, MD, PhD,[b] Yvonne Vergouwe, PhD,[c] H. A. Martino Neumann, MD, PhD,[a] Marianne G. R. de Maeseneer, MD, PhD,[a,d] and Tamar Nijsten, MD, PhD,[a] *Rotterdam and Arnhem, The Netherlands; and Antwerp, Belgium*

Objective: Phlebectomy of varicose tributaries is usually considered an additional treatment after or during saphenous ablation. As phlebectomies alone affect the hemodynamics of the venous system, this treatment can be effective as primary intervention in selected patients. The objective of this study was to analyze hemodynamic, clinical, and patient-reported outcomes after phlebectomies in a prospective multicenter study to determine predictors for treatment success, that is, restoration of great saphenous vein (GSV) competence.
Methods: Patients with symptomatic GSV and tributary incompetence (reflux > 0.5 second) at the level of the thigh were included. Duplex ultrasound (DUS) was used to assess GSV and tributary characteristics, and a reflux elimination test was performed. Three and 12 months after phlebectomy of the tributary, reflux and GSV diameter were evaluated with DUS. Clinical outcome measures were C class of the Clinical, Etiologic, Anatomic, and Pathologic (CEAP) classification and Venous Clinical Severity Score; patients' reported outcome was determined by the Aberdeen Varicose Vein Questionnaire. To evaluate differences between the success and failure groups, baseline DUS characteristics, Venous Clinical Severity Score, CEAP class, and Aberdeen Varicose Vein Questionnaire score were compared. Multivariable logistic regression including all clinically relevant variables following a backward variable elimination proc determine predictors for success. The model w validated by 1000 bootstrap samples.
Results: The study included 94 patients (65 w with a mean age of 53 years. The majority had C2 or C3 disease. One year after treatment, GSV reflux had disappeared in 50% of patients ($P < .01$) and GSV diameter had decreased significantly ($P < .01$). Clinical outcome and Aberdeen Varicose Vein Questionnaire score improved significantly ($P < .01$) and symptoms had disappeared in 66%. Of 47 patients with persisting GSV incompetence, 15 did not receive additional treatment because they were asymptomatic. Independent predictors for success were low C class of the CEAP classification, low number of refluxing GSV segments, small diameter of the GSV above the tributary, and positive reflux elimination test result ($P < .0001$). The reflux elimination test appeared to be an important independent predictor, with >65% chance of success when the result was positive.
Conclusions: At 1-year follow-up, treatment with single phlebectomies of a large tributary was effective to abolish GSV reflux in 50% of patients and to free 66% of patients from symptoms. Patients with limited disease progression and mild DUS alterations are most likely to benefit from this approach. (J Vasc Surg: Venous and Lym Dis 2014;2:179-87.)

1 year :Abolition reflux 50%
Abolition symptoms 66%
(unselected population)

More targeted surgery : « à la carte »

15 Lesser importance of the saphenous vein in varicose vein treatment

Paul Pittaluga and Sylvain Chastanet

There is no longer any place for systematic elimination of the SJ and the SV: numerous studies show that extensive ostial-trunk reflux is involved in only a minority of cases.[12–16,80,81] Regardless of the technique chosen, the procedure should be adapted to each individual case and should involve the least aggressive option.

What did we learn from endovenous techniques ?

2) New technical approach

Local anesthesia

Tumescence: reduces disadvantages of LA

Local anesthesia

Tumescence: reduces disadvantages of LA

- **Almost no limit for the surface treated**
  - **Dilution** of the lidocaine (< limit dose 7 mg/kg)
  - Possibility of use of **large volumes**

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- **Patient comfort**
  - Use of **bicarbonate +++** : reduces acidity and injection pain
  - Increases **non-dissociated and active** lidocaine +++
  - Excellent **quality** anesthesia

Local anesthesia

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- **Surgeon comfort**
  - Excellent **quality/duration** anesthesia
  - **Reduction bleeding +++**

Modern mini-invasive « open » surgery

- ✓ Atraumatic phlebectomy
- ✓ Micro-incisions
- ✓ Precise skin marking
- ✓ Bloodless surgery

Modern mini-invasive « open » surgery

- ✓ No stiches – adhesive tapes
- ✓ Immediate walking
- ✓ Very quick discharge (1h)

Modern mini-invasive « open » surgery

Very limited side effects

Value of postoperative compression after mini-invasive surgical treatment of varicose veins

Paul Pittaluga, MD,[a,b] and **Sylvain Chastanet, MD,**[a,b] *Nice, France; and Monte Carlo, Monaco*

J Vasc Surg: Venous and Lym Dis 2013;1:385-91

Table IV. Influence of the surgical procedure on postoperative course at the postoperative control

	Stripping	*ASVAL*	*Phlebectomy*	*Redo surgery*
Pain score (average VAS)	0.6	0.9	0.4[a]	0.9
Ecchymosis score (average VAS)	0.8	0.8	1.5	0.8
QoL score (CIVIQ)	9.9	8.0	5.6	12.0
No sick leave (working people)	50%	68%	90%[b]	66%

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Very limited side effects

Value of postoperative compression after mini-invasive surgical treatment of varicose veins

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Table IV. Influence of the surgical procedure on postoperative course at the postoperative control

	Stripping	*ASVAL*	*Phlebectomy*	*Redo surgery*
Pain score (average VAS)	0.6	0.9	0.4[a]	0.9
Ecchymosis score (average VAS)	0.8	0.8	1.5	0.8
QoL score (CIVIQ)	9.9	8.0	5.6	12.0
No sick leave (working people)	50%	68%	90%[b]	66%

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Mini-invasive surgery should be the best option

- RF and EVLT treat only the saphenous vein
- Mini-invasive surgery > foam +++ :

  Treatment more durable
  Treatment more extensive
  Treatment more selective
  Less inflammation
  Less pigmentation
  Better esthetic result

Mini-invasive surgery > foam +++

Preop

D8

TAKE HOME MESSAGE

1) **Traditional surgery is over**
- Endovenous techniques: at least as much efficient than stripping
- Endovenous techniques: less side effects

2) **Surgery should change**
- New strategy of treatment: more targeted and more tailored
- New mini-invasive technical approach: TLA, microphlebectomy, ambulation

3) **“New surgery” takes advantages from this evolution**
- Efficiency / durability / selectivity / safety
- Very limited side effects

4) **“New surgery” will take market shares**
- From the endovenous techniques: saphenous sparing
- From the foam +++: better results, better control