

Selective vs radical crosssectomy of the great saphenous vein in primitive venous insufficiency: results at 5 years

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Aim. The aim of the study is to keep again the incidence of groin recurrences at 5 years follow-up, on two groups of patients operated with a technique of selective crosssectomy and radical crosssectomy of the great saphenous vein (GSV), to verify the importance of the collateral veins of S-F junction in groin recurrences. The classic surgery of superficial venous system has had many improvements, so the “traditional” idea of radical crosssectomy (Babcock, 1907) has been won by the “new” selective technique, which may be executed on traditional way or by the new endovascular techniques.

Methods. Non-concurrent prospective study, the selected casuistry concerns in 300 patients (220 female and 80 male, mean age 54 years, range 25-77), CEAP 2-S/3 Ep As(2/3) Pr, operated from January 2002 to December 2006, choosed with random method, divided in two groups (150 treated by selective crosssectomy and 150 by radical crosssectomy), 60 patients for every year was considered. All the patients were operated of crosssectomy by an unique surgeon for each group, in day-surgery and local anesthesia. All these patients were submitted to clinical venous examination and to Duplex scanning of the lower limbs, by an independent operator, at different times from the operation (the follow-up is from 5 years for the patients operated in 2002 to 1 years for the patients operated in 2006).

Results. On 300 patients controlled with Duplex has been seen in the group of selective crosssectomy 1 groin recurrence (0.6%), in the group of radical crosssectomy 14 groin recurrences (9.3%).

Conclusion. Based on the clinic experience done on examined 300 patients, we can observe like the internal selective crosssectomy, saving the tributary veins coming from the abdominal wall, joint to the convenient treatment of saphenous insufficiency, revealed an efficacious therapy, giving

results of undoubtable validity from the point of view prognostic and the rate of groin recurrences at 5 years.

Key words: Crosssectomy - Veins, surgery - Saphenous vein.

Strengthening fold the varices surgery has undoubtedly had an important benefice, in the last twenty years, of new acquisitions that modified the indications, and overall, the surgical approach. The classic surgery of superficial venous system has had many improvements, so the “traditional” idea of radical crosssectomy has been won by the “new” selective technique, which may be executed on traditional way (open sky) or by the new endovascular techniques.

Anatomically^{1,2} the sapheno-femoral (S-F) junction is situated on the Scarpa triangle (limited highly from the crural arch, laterally from the sartorius muscle and medially from the adductor middle muscle) where the great saphenous vein (GSV) enter through the cribriform belt, immediately over the Allan-Burns ligament, that matches a strengthening fold of the cribriform belt. The GSV terminates at the S-F junction in a variety of patterns. The S-F junction is opened on the behind face of common femoral vein, about four cm down the crural arch. On this level its more important relationship are:

— lymphatics, with Rouviere lymphnode, situated in its cavity or may be surrounded by four lymphatic groups;

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— arteries, with the lower external pudendal artery, branch of femoral artery, which goes (often lowerly, sometimes crossing) the crosse;

— nerves, with nerves of crural branch of genito-crural nerve, (also is often is founded laterally and distant).

The tributary veins of S-F junction lead in 75% in isolated way in GSV, while in the further 25% with common branches or directly in the deep venous system. The collateral veins of the S-F junction are represented by:

— external pudendal vein, which are born with a superior cutaneous branch, that collect the refluent blood from pubis mount, and with an inferior subfasial branch which is alimented of blood by the scrotum in the male and labia majora in the female. They drain the most pubis territory, often they anastomose with contralateral pudendal and with dorsal subcutaneous vein of penis or clitoris, communicating on the last with perineal superficial veins;

— superficial iliac circumflex vein, which drains the trochanteric area, collecting refluent blood, partially from the abdominal part or the buttock part;

— superficial epigastric vein, wich starts from the confluence of paraumbilical vessels and drains the lower half of abdominal wall. In the most cases anastomose always in the interior part of abdominal wall, with thoracoepigastric vein which run on the anterolateral wall of trunk, going upper with lateral thoracic vein, tributary of axillary vein;

— anterior lateral thigh vein from anterior and lateral side of the thigh.

The venous drainages^{1,2} represent some of many communications between the superficial venous system and deep veins that are, on various levels, preferential anastomotic pathway through them the blood goes from the superficial to the deep net. So, also the femoral vein, through the tributary veins of saphenic belt, receives affluent branches from the genital area end overall from abdominal wall, in other words veins coming from subcutaneous participating to the real cutaneous net of abdominal wall.

The superficial epigastric and the circumflex superficial iliac, together with the thoracoepigastric and an affluent vein of the venous arch of jugulo, with perforant branches communicating with the internal thoracic veins, side thoracic and external pudendal, are forming a net of vessels largely anastomotic, called also vein cutaneous net of anterolateral wall of trunk.

This one, upper, leads to the external jugular vein, to the axillary vein and to the brachiocephalic trunk and lower it connects to the common femoral vein, making a huge communication system between the superior caval vein and the inferior one. Besides the anastomosis that this net makes with paraumbilical do an important collateral way between the system of portal vein and that general one.

The crossectomy is, usually, the first time of operation and can be distinguished in:

— radical, thought by Tavel and Facobson and improved by Babcock (1907),³ which consists in the lacing razed of common femoral vein, in the white line of Biglioli, and cutting of all the tributary veins of junction;

— selective, the technique of Genovese (2003)⁴ consists to save the only superficial epigastric vein, instead our technique consists to leave a stump long about 1 cm and above all the saving of all the tributary veins coming from the abdomen wall and the groin, all that one presenting an obtuse angle respect to the saphenic axis.

Our experience wants to keep again the incidences of recurrences at maximum 5 years follow-up, on patients operated with technique of selective and radical crossectomy, having the importance of collateral veins of junction supplanting the “traditional” idea that the non radicality is directly proportional of groin recurrent varicosities.

Materials and methods

The crossectomy of the GSV⁴⁻⁶ is one of the essential step in the surgery of superficial veins and its operation wants the sharp dissection of different anatomic levels. The internal selective crossectomy is then a surgical act that follows well defined moments: the cut must be centred on the level of groin fold (corresponding to the Scarpa’s triangle base) about 4 cm, having like repere points the femoral artery on the side and the pubic tuberculum on the medium (about 3 cm). Cutted the superficial cribriform belt running lengthwise and toward bottom, to save the lymphatic trunks, we exhibit the GSV, that is liberated down about for 5 cm, while on the top, making light traction with an atraumatic vascular pliers, with delicated scissors we exhibit and separated the tributary veins of junction. Differently of the traditional concept of radical crossectomy, the veins coming from the top, in other words the superficial epigastric vein and the

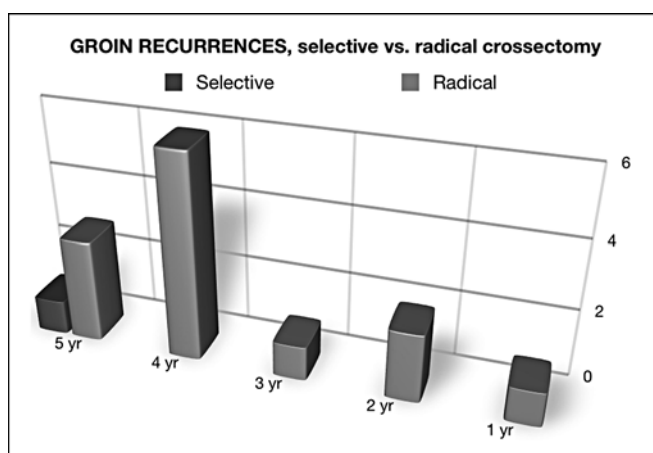


Figure 1.—Groin recurrences, selective vs radical crosssectomy.

superficial circumflex iliac vein, are saved, while the external pudendal veins, when present an acute angle with the saphenic axis or a T branch from lower part, are carefully insulated, ligated with no reabsorbable thread 2/0 and dissected. Now we pass two laces, with the same thread, about 1 cm from the S-F junction and immediately down the confluence of saved tributary veins, warranting in this way the drain to the stump leaved on situ (Figure 1). In this point the GSV, that can be closed also bottom with the same thread or prepared for the following stripping, is carefully dissected. After seeing the surgeon field for an accurate hemostasis, we suture the skin with a no reabsorbable thread 4/0, that could be removed after 7 days from the surgery.

From January 2002 to December 2006 1 484 patients

(1000 female and 484 male), 512 patients (370 female and 142 male) operated by selective crosssectomy of GSV and 972 (630 female and 342 male) operated by radical crosssectomy, mean aged 57 years (range 15-87) were treated. The lower limbs operated with this technique are 273 rights and 239 lefts. All the patients were submitted to GSV crosssectomy by a unique surgeon for each group, in day-surgery and loco-regional anesthesia. More precisely the operations were 284 in 2002, 357 in 2003, 309 in 2004, 295 in 2005 and 239 in 2006.

The study is a non-concurrent prospective study, the selected casuistry concerns in 300 patients choosed with random method, divided in 60 patients for every year considered (30 for each group of patients), CEAP 2-S/3 Ep/As(2/3) Pr.

Of this patients group, 220 were females and 80 males, mean aged 57 years (range 25-77) and the considered limbs have been 157 rights and 143 lefts. Particularly, it was executed: the selective internal crosssectomy and 106 short stripping of GSV, 5 medium and 7 long, 28 crosssectomies with phlebectomies and 5 isolated selective crosssectomies; the radical crosssectomy and 139 short stripping, 2 medium and 3 long, 6 isolated crosssectomies.

All patients were submitted to clinical examination of the lower limbs and Duplex scanning by an independent operator in 2007 (the follow-up is from 5 years for the patients operated in 2002 to 1 year for the patients operated in 2006).

Results

No patient who has had surgery therapy is dead; no

TABLE I.—Selective vs radical crosssectomy: results.

Years of operation	2002	2003	2004	2005	2006
Follow-up (years)	5	4	3	2	1
Selective number of patients	30	30	30	30	30
Groin recurrences	1 (0.6%)	—	—	—	—
Total groin recurrences 1 (0.6%)					
Radical number of patients	30	30	30	30	30
Groin recurrences	3 (10%)	6 (20%)	1 (0,6 %)	2 (1.2%)	1 (0.6%)
Total groin recurrences 14 (9.3%)					

TABLE II.—*Lower limb recurrences after operation.*

Years of operation	2002	2003	2004	2005	2006
No. of patients	60	60	60		60
Follow-up (years)	5	4	2	2	1
Dodd	10	7	5	30	1
Boyd	3	1	—	—	—
Cockett	—	—	1	—	—
Isolated varices	8	8	14	30	4
Recurrences	21 (35%)	16 (26.6%)	20 (33.3%)	2 (1.2%)	5 (8.3%)
Total recurrences 73 (24.3%)					

morbidity or thromboembolic events were registered. No patient had infection of surgery wounds.

To everybody has been advised the monocollant of 2nd class of compression for 30 days (Sigvaris 503®).

On 300 patients controlled with Duplex scanning (Table I) has been seen only 1 groin recurrence (0.6%) in the group of selective crossectomy. The recurrence is own to a tactical mistake of operator; in fact to the patient (GSV selective internal crossectomy in December 2002) was left the anterior lateral thigh vein, that leads as common trunk together with the external iliac circumflex vein. This mistake was made not in the surgery, not in the mapping before the operation, considered the anterior vein was perfectly continent, also to the Valsalva manoeuvre, but the vein became incontinent after some years from the operation. The position of the vein, that have an acute angle of termination in the GSV, can support the venous reflux after the operation and for this anatomical reason we think that it is necessary to abolish the vein during the selective crossectomy. The recurrent varices was treated with two sessions of echoguided sclerotherapy by scleromousse (polidocanol 1% in foam). The residual stump of GSV is always long about 1 cm and it is continually washed by venous flow from the collateral veins: we don't observed thrombosis of the stump.

The groin recurrences in the group of GSV radical crossectomy are 14 (9.3%) with 4 cases of the so called "cavernoma" (28.6%), a group of convoluted varicosity or "spongework" of varicosities, in absence of a residual saphenous stump.

Discussion and conclusions

The idea of selective crossectomy⁴ come from various considerations done on some states, pathological or not, joint to a venous insufficiency. In fact the hepatopathy generally, as origin of portal hypertension, but above all the pregnancy, have done study better the tributary veins of S-F junction, studying particularly the flow of all junction tributaries and saying therefore that all the veins coming from the top never give reflux, but a downflow from the areas drained from the same veins. Because the patterns of recurrences are highly variable and there are often multiple causes of recurrent varicose veins can be defined. Besides, as kown from years, the new vasculogenesis can be favourite also from the surgical cutting of a venous vessel; in fact the totally of small veins, meduse head, set to canalize again a below venous trunk, called usually "cavernoma". A growing concept in study of recurrent varicose veins is that neovascularization is occurring with direct communication of new vessels from the femoral vein to superficial refluxing veins. Most surgeons discussing the problem of recurrent varicosities emphasize a thorough groin dissection with exploration of the femoral vein to ensure that no superficial connections in the groin go directly to the femoral vein. This concept may be entirely erroneus; maybe the ablation of drainage of the abdominal wall veins leads to varicose recurrence. Endovascular radiofrequency or laser ablation techniques allow ablation of the GSV without groin dissection, and duplex examination in these cases may show absence of neovascularization.⁵⁻⁷ It may be that a careful groin dissection is the cause of neovascularization. Besides from the operator was looked a great rapidity in these kind of operation, but also a reduced traumaticity of tis-

sues and lymphnodes, always present in immediate environmental of S-F junction. It is very important also to compare our study with the others published on the radical crossectomy. Allegra et al.⁸ observed that, on 862 patients at 5 years follow-up with Duplex ultrasonography, 109 patients had groin recurrences (13% of the cases). Hartmann et al.⁹ controlled by Duplex 265 limbs of 210 patients at 14 years follow-up and they revealed in 6.1% of the cases a reflux coming from the tributary veins of S-F junction (superficial epigastric vein or external pudendal), while the 31.5% presented a reflux coming directly from the S-F junction, also if only the 6.9% had recurrences with a diameter over 3 mm and so they were candidated to a reintervention. This study has observed that after 14 years, in absence of evident surgical mistakes, almost one patient on three presented some relapsing junction after a radical crossectomy operation and was accused, as principal cause, the neovascularization, while a wide risk factor is represented by the obesity.

Then, based on the clinic experience done on examined 300 patients, we can observe like the internal selective crossectomy, saving the tributary veins coming from the top, joint to the convenient treatment of base saphenic insufficiency, is an efficacious therapy, giving results of undoubtable validity from the point of view prognostic and for the reduced, is better null, rate of groin recidives in 5 years. The unique case of groin recurrences has reinforced the idea to keep out all that can be origin of reflux toward bottom, also if at the moment of operation such veins present content also to the Valsalva manoeuvre or compression/relaxation. This means that the unique attention to obtain an optimum result on time is to well isolate all the tributary veins of S-F junction, given that no seldom are founded T branches of external pudendal veins and superficial iliac circumflex veins from lower part. All these anatomic conditions must to be treated with maximum attention and decision, that is by the section of vein that leads bottom, being a sure origin of reflux and therefore timely recurrences.

In the past 10 years venous surgery has taken minimal invasive or endovascular approaches: the two most accredited techniques are radiofrequency and endolaser ablation. The purpose of these techniques is to close the great saphenous vein starting at about 2 cm below the S-F junction. This leaves all or nearly all collateral tributaries, but the results in terms of recurrences from the saphenous stump seem to be better

than the radical crossectomy.⁷⁻¹¹

These new experiences (selective crossectomy and endovascular techniques) could overturn 50 years of surgical approach and tradition to IVC, but it's necessary to wait more some years to prove these methods of operation.

Riassunto

Crossectomia selettiva vs radicale della vena grande safena nell'insufficienza venosa primitiva: risultati a 5 anni

Obiettivo. L'obiettivo dello studio è stato quello di valutare l'incidenza di recidive inguinali a 5 anni di follow-up, in due gruppi di pazienti sottoposti ad intervento chirurgico di crossectomia selettiva e radicale della vena grande safena (GSV), al fine di valutare l'importanza delle vene collaterali alla giunzione S-F nelle recidive inguinali. La chirurgia classica a livello del sistema venoso superficiale ha compiuto notevoli progressi, cosicchè il concetto "tradizionale" della crossectomia radicale (Babcock, 1907) è stato superato e sostituito dalla "nuova" tecnica selettiva, che può essere eseguita per via tradizionale o tramite nuove tecniche endovascolari.

Metodi. In questo studio prospettico, la casistica selezionata è costituita da 300 pazienti (220 di sesso femminile e 80 di sesso maschile, di età media 54 anni, range 25-77), CEAP 2-S/3 Ep As (2/3) Pr, sottoposti ad intervento chirurgico nel periodo di tempo compreso tra Gennaio 2002 e Dicembre 2006, scelti in maniera random e suddivisi in due gruppi (150 trattati con crossectomia selettiva e 150 con crossectomia radicale). Sono stati valutati 60 pazienti per anno. Tutti i pazienti sono stati sottoposti a crossectomia da parte dello stesso chirurgo in ciascun gruppo, in regime di day-surgery e in anestesia locale. Tutti questi pazienti sono stati sottoposti a visita clinica dell'apparato venoso e ad esame Doppler degli arti inferiori, da parte di un operatore indipendente, in diversi momenti dopo l'intervento chirurgico (il follow-up varia da 5 anni per i pazienti operati nel 2002 fino a 1 anno per quelli operati nel 2006).

Risultati. Nei 300 pazienti sottoposti a controllo Doppler, è stata riscontrata una recidiva inguinale (0,6%) nel gruppo sottoposto a crossectomia selettiva, mentre nel gruppo della crossectomia radicale ne sono state diagnosticate 14 (9,3%).

Conclusioni. Sulla base dell'esperienza clinica maturata in questi 300 pazienti, gli Autori concludono che la crossectomia selettiva interna, risparmiando le vene tributarie provenienti dalla parete addominale, congiunta all'opportuno trattamento dell'insufficienza delle vene safene, sia una terapia efficace, con risultati di indubbia validità dal punto di vista prognostico e in termini di tassi di recidiva inguinale a 5 anni.

Parole chiave: Crossectomia - Vene, chirurgia - Vena safena.

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