

Varicose vein surgery in obese patients

G. Bruning¹; M. Donath²; J. K. Buhr¹

¹Krankenhaus Tabea GmbH & Co. KG, Hamburg; ²Allergie- und Hautpraxis, Brugg/Schweiz

Keywords

Chronic venous insufficiency, obesity, varicose vein surgery, recurrent varicose veins, endovenous treatment

Summary

With correct intraoperative management, surgery for varicose veins is also an excellent treatment option for obese patients. Body weight can be ignored in surgery to the small saphenous vein and varicose tributaries, but surgical treatment of the great saphenous vein must be planned and adapted according to weight: surgical access should be above the groin and sufficiently large, a double ligation using non-absorbable suture material should be applied to the stump and the stump endothelium coagulated. Recurrence of high ligation and stripping is a particular challenge in obese patients after both varicose vein surgery and endovenous treatment techniques. The rate of complications after surgical treatment is very low. The infection rate in obese patients is only marginally above that in patients with a BMI < 30. There is no risk assessment currently available for endovenous procedures in obese patients. However, the tendency for recurrence is higher with larger lumen vessels.

Schlüsselwörter

Chronisch venöse Insuffizienz, Adipositas, Varizenchirurgie, Crossenrevision, Endovenöse Therapie

Zusammenfassung

Die operative Sanierung der Varikosis stellt bei korrektem intraoperativen Management auch bei adipösen Patienten eine hervorragende Therapieoption dar. Bei der operativen Sanierung der Vena saphena parva und der Seitenastvarikosis ist das Körpergewicht vernachlässigbar, die operative Therapie der Vena saphena magna muss jedoch gewichtsadaptiert geplant und angepasst werden: Der operative Zugang sollte oberhalb der Leistenbeuge und ausreichend groß gewählt werden, die Stumpfligatur mit nicht resorbierbarem Nahtmaterial doppelt ligiert und das Stumpfendothel koaguliert werden. Crossenrezidive stellen insbesondere bei adipösen Patienten sowohl nach operativer Sanierung der Varikosis, als auch nach endovenösen Therapieverfahren eine operative Herausforderung dar. Die Komplikationsrate bei operativer Sanierung ist sehr niedrig. Die Infektionsrate liegt bei adipösen Patienten nur marginal oberhalb derer von Patienten mit einem BMI < 30. Eine Risikoeinschätzung von endovenösen Therapien bei adipösen Patienten steht aktuell aus. Es besteht allerdings eine höhere Rezidivneigung bei größerlumigen Gefäßen.

Correspondence to:

Dr. med. Guido Bruning
Chefarzt – Krankenhaus Tabea GmbH & Co.KG
Kösterbergstr. 32, 22587 Hamburg
E-Mail: gbruning@tabea-krankenhaus.de

Varizenchirurgie bei Adipositas

Phlebologie 2018; 47: 71–74
<https://doi.org/10.12687/phleb2415-2-2018>
Submitted: 31. January 2018
Accepted: 18. February 2018

Introduction

Chronic venous insufficiency is a very common disease in the Federal Republic of Germany. Approx. 10% of all Germans

have veins that require treatment and approx. 1% suffer from a venous leg ulcer (1).

The incidence of obesity has increased markedly in recent years (2) and this also leads to an increasing proportion of obese

patients with chronic venous insufficiency (3, 4). The surgical treatment of varicose veins in obesity presents a particular challenge.

Indication for surgical treatment of obese patients

The weighting of obesity as a risk factor for the surgical treatment of chronic venous insufficiency depends on the findings in the individual patient. Varicose vein surgery should only be contemplated in obese patients, if there is an absolutely certain need for treatment, i.e. if the varicose veins are causing symptoms. The positive correlation between obesity and progression of an existing chronic venous insufficiency must be considered (3).

Obesity plays only a subordinate role in the surgical treatment of the small saphenous vein by popliteal high ligation and stripping or removal of tributaries, because surgical access is generally not significantly restricted by the existing obesity.

This operation is usually performed without complications under tumescent local anaesthesia without general anaesthesia. A limiting factor is the maximum load of the operating table.

However, obesity presents a significant hindrance to surgical treatment of the great saphenous vein, because it makes it substantially more difficult to reach the deep saphenofemoral junction.

We plan all varicose vein surgery for patients with a BMI > 30 under general anaesthesia in addition to tumescent local anaesthesia, because the latter is often insufficient for the depth of the operating field. In our hospital, we have set a BMI of 40 as the upper limit for surgery to the great saphenous vein. This is only exceeded in excep-



Fig. 1 Recurrence of varicosis after high ligation and stripping in obese patients

tional cases, e.g. in the case of a florid venous leg ulcer.

Surgical technique for chronic venous insufficiency in obese patients

Surgical access in obese patients should be secured above the groin. This access route prevents disappearance of the incision in the moist groin, thus avoiding the in-

Tab. 1 Composition of the 0.069% solution used by us for tumescent local anaesthesia (TLA)

	3 litres	5 litres
NaCl solution 0.9%	3000 mL	5000 mL
Prilocaine 1% (Xylonest)	225 mL	375 mL
Sodium hydrogencarbonate 8.4%	20 mL	40 mL
Adrenaline (Suprarenin) 1:1000	3 mL	5 mL

creased occurrence of postoperative wound infections.

In addition, the surgical access route should be made large enough, so that an adequate depth and width of dissection can be guaranteed and a reliable access path is available, if bleeding complications should occur.

In order to avoid the considerable greater surgical challenge of a recurrence, it is important not to proceed too cautiously in terms of the depth of radical surgery (5) (► Fig. 1).

Stump ligation should be carried out with non-absorbable, non-dissolvable sutures to ensure an optimum ligation of the junction with a low rate of recurrence. We perform a double ligation or, alternatively, a suture (transfixion) ligation can be used. In addition, the free stump endothelium should be coagulated or overstitched to prevent neoangiogenesis – a common trigger for recurrent varicosis after high ligation and stripping.

In addition to general anaesthesia, we perform these operations under tumescent local anaesthesia in a 0.069% solution of prilocaine (► Tab. 1). We limit the maximum dose to 20mg/kg BW (6). This leads to less severe haematomas even in obese patients and less postoperative pain, so that this can generally be managed with oral peripheral analgesics.

Surgical treatment of recurrent varicosis after high ligation and stripping in obese patients

Approx. 8–10% of patients develop a clinically relevant recurrence within 5 years of surgery (4). With modern surgical techniques and the use of non-absorbable suture material, this rate can be reduced to below 5% (7). Due to scarring in the surgical field from the previous operation, recurrence after high ligation and stripping presents a particular surgical challenge.

Recurrence after high ligation is seen to an increasing degree after endovenous procedures as well. These are usually also associated with increased scar formation in the junction region.

The modified groin access described by Junod has proved suitable for the surgical treatment of recurrent varicosis after high ligation and stripping (8).

This procedure consists of an inguinal transverse incision and longitudinal surgical preparation of the femoral artery followed by medial preparation of the common femoral vein to allow access underneath the old scar tissue of the stump of the great saphenous vein (► Fig. 2, ► Fig. 3). This is often intact in very obese patients, because the previous surgeon had not reached the deep regions. After double ligation of the stump (► Fig. 4) at the junction, the recurrent bed can be sharply separated from the scar tissue, without any increased risk of bleeding. This procedure has also proved worthwhile with scar stumps after endoluminal or radiofrequency ablation.

Complications of varicose vein surgery

Typical complications following varicose vein surgery are damage to nerves, deep vein thrombosis, bleeding, wound infections and the formation of a postoperative seroma (9).

The overall rate of complications of varicose vein surgery is very low (► Tab. 2). In our hospital, for example, the rate of infection with the indicator operation, inguinal repeat ligation, is 1.2%.

Above average rates of postoperative thrombosis are seen in patients following surgical removal of the small saphenous vein. Since only symptomatic postoperative thrombosis was included in our recorded data, the rate of postoperative thrombosis can only be estimated, but it is considerably below 0.5%.

An internal analysis of complications after 1803 operations performed on 1475 patients showed a gratifyingly low rate of postoperative nerve damage and bleeding. Heavy intraoperative bleeding occurred in 0.4% of the 1803 operations, i.e. seven times.

No transfusion-requiring bleeding complications have occurred in our patients in the approx. 30,000 operations carried out over the last 14 years.

The rate of nerve damage, with paraesthesia persisting for at least 3 months, is a manageable 2.99%. The risk of nerve damage was far lower in obese patients than in slim ones. Thus obesity is not associated with an increased risk of all types of complications.

The rate of infection in obese patients tends to be somewhat higher than that in patients with a BMI of ≤ 30 . However, if the complications of abscess and erysipelas are combined to form a single infection group (according to CDC criteria), there are significant differences between the two groups $p = 0.0161 < 0.05$. For example, 3.05% of the patients with BMI > 30 ($n = 262$) developed an infection, but only 1.02% of the slim patients with a BMI ≤ 30 ($n=1372$).“

To our own surprise, patients with a BMI > 30 had a substantially lower risk of seroma than patients with a BMI ≤ 30 . The risk of seroma is markedly increased with surgery for recurrence compared with the primary operation. This can be explained by the increased damage to the lymphatic system by the sharp dissection in the scar tissue and in the area of the common femoral vein.

Status of surgical treatment versus endovenous procedures

It is often suggested that endovenous procedures carry a lower treatment risk compared to classical surgery. However, there is no unequivocal data in support of this suggestion in the case of obese patients.

Nevertheless, the success rate of endovenous treatment falls significantly with larger diameters of the great saphenous vein and the frequency of recurrence increases. Inguinal reflux occurs in about 10% of patients after endovenous therapy compared with $< 5\%$ after classical high ligation and stripping (7).

This has just been demonstrated in a new meta-analysis (10).

Perioperative morbidity, mortality and quality of life do not differ significantly between the two techniques. The classical therapy of varicose veins with high ligation and stripping certainly produces a con-

Fig. 2 Modified access according to Junod: Exposure of the femoral artery, femoral vein, residual stump of the great saphenous vein

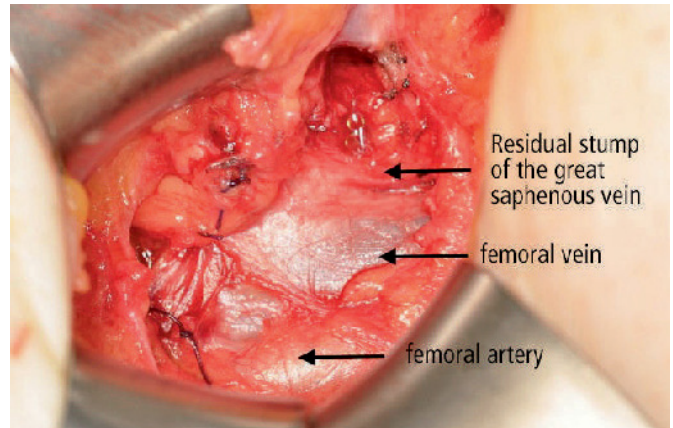


Fig. 3 Encircling of the residual stump of the great saphenous vein with the Mixer forceps

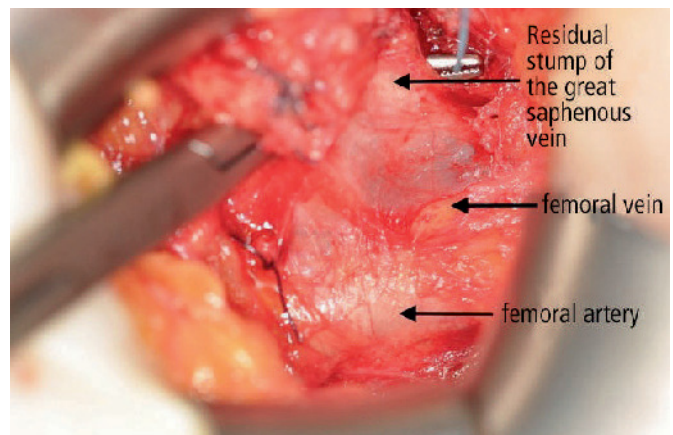
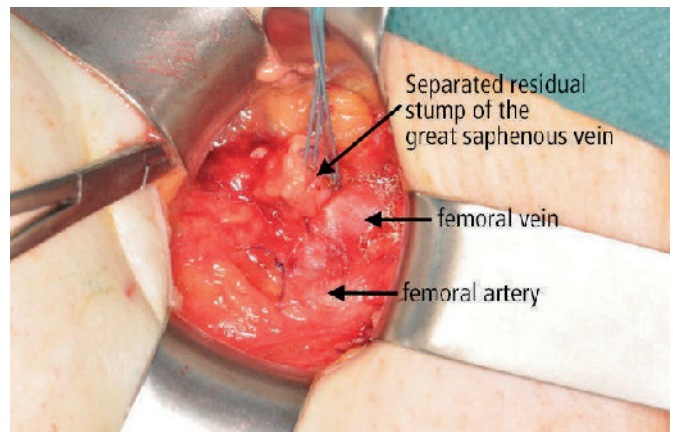


Fig. 4 Separated residual stump of the great saphenous vein with double non-absorbable, non-dissolvable ligature



Tab. 2 Postoperative complications; the percentages refer to the respective total number of operated legs, for which the postoperative questionnaire was completed by patients.

	Total n = 1641	Recurrence n = 227	BMI 30 n = 1372	BMI > 30 n = 262
Abscess	16 (1.0%)	8 (3.5%)	10 (0.7%)	6 (2.3%)
Erysipelas	7 (0.4%)	3 (1.3%)	5 (0.4%)	2 (0.8%)
Seroma	63 (3.8%)	19 (8.4%)	57 (4.2%)	6 (2.3%)
Haematoma	35 (2.1%)	7 (3.1%)	29 (2.1%)	6 (2.3%)
Swelling	143 (8.7%)	32 (14.1%)	105 (7.7%)	36 (13.7%)
Thrombosis	1 (0.1%)	0 (0%)	0 (0.0%)	1 (0.4%)

siderable improvement in both short-term and long-term quality of life for patients (4).

We therefore prefer classical surgery to endovenous procedures for the treatment of varicose veins with a venous diameter of >10 mm in the region of the saphenofemoral junction. The risk of recurrence with the inguinal junction type of anterior accessory vein incompetence also appears higher, so we also prefer to perform the classical operation in such cases (11). However, in suitable cases – venous diameter <10 mm – we prefer to use endovenous techniques due to the simpler procedure and reimbursement by the health insurance schemes.

Conclusions

Obesity presents a challenge to the surgeon performing varicose vein surgery. However, with adequate experience and an appropriately adapted surgical setting, very good postoperative results with low rates of

complications can also be achieved in obese patients.

Conflict of interest

The authors declare no conflict of interest.

Ethical guidelines

Preparation of the manuscript did not involve any studies on humans or animals.

References

1. Rabe E, Pannier-Fischer F, Broman K, Schuldt K, Stang a, Poncar C, et al. Bonner Venenstudie der Deutschen Gesellschaft für Phlebologie. *Phlebologie* 2003; 32(1): 1–14.
2. Smith KB, Smith MS. *Obesity Statistics* 2016; 121–35.
3. Göstl K, Obermayer A, Hirschl M. Pathogenesis of chronic venous insufficiency by obesity. *Phlebologie* 2009; 108–13.
4. Faubel R, Schäfer I, Augustin M, Bruning G. Langzeitergebnisse und Analysen von Zusammenhängen 5 Jahre nach Varizenstripping. *Phlebologie* 2010; 263–269.
5. Mann S. *Chirurgie der Rezidivvarikose*. Chirurgen Magazin 2008.
6. Bruning G, Standl T, Diedrich A, I. Moll. Prilocaine pharmacokinetics and the influence of vitamin C on methaemoglobin concentrations in tumescent anaesthesia. *Phlebologie* 2007; 145–150.
7. Gauw SA, Lawson JA, van Vlijmen-van Keulen CJ, Pronk P, Gaastra MTW, Mooij MC. Five-year follow-up of a randomized, controlled trial comparing saphenofemoral ligation and stripping of the great saphenous vein with endovenous laser ablation using local tumescent anesthesia. *Journal of Vascular Surgery* 63(2): 420–428.
8. Bruning G, Schinagl H. Die operative Sanierung des inguinalen Crossenrezidivs mittels modifiziertem Zugang nach Junod. *J Dtsch Dermatol Ges.* 2011; 9(8): 646–647.
9. Hofer T. Komplikationen nach varizenchirurgischen Eingriffen. *Phlebologie* 2001; 30: 26–30.
10. Hamann SAS, Giang J, De Maeseneer MGR, Nijsten TEC, van den Bos RR. Editor's Choice – Five Year Results of Great Saphenous Vein Treatment: A Meta-analysis. *Eur J Vasc Endovasc Surg* 2017; 54(6): 760–770.
11. Rass K, Frings N, Glowacki P, Graber S, Tilgen W, Vogt T. Same Site Recurrence is More Frequent After Endovenous Laser Ablation Compared with High Ligation and Stripping of the Great Saphenous Vein: 5 year Results of a Randomized Clinical Trial (RELACS Study). *Eur J Vasc Endovasc Surg* 2015; 50(5): 648–656.