Great uncertainty regarding treatment of varicose vein recurrence

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Summary
Introduction: Although varicose vein recurrence is common and 10–30 % of all varicose vein surgery is done for recurrence of some sort, there are very few studies that can guide us to the best re-treatment option. With the introduction of minimal invasive endovenous treatments there is a variety of possible options besides traditional open surgical techniques.

Method: The Scandinavian Venous Forum held a symposium at the GSP meeting in Lübeck 2012 and this review article is based on data from the presentations at that symposium. Further data has been added regarding new knowledge that was not available a year ago, from PubMed search and article references.

Results: The most common reasons for recurrence are due to symptoms between neovascularization (NV) and recurrence due to technical failures. It is likely that NV is the most commonly duplex detected type of recurrence following open groin surgery, less common early after endovascular techniques. However, technical or tactical failures are the most common reasons for redo surgery because of symptomatic recurrence. NV seldom leads to symptomatic recurrences and thus a need for re-treatment. There is a risk that the stumps left following endovenous treatments will become a source for symptomatic recurrence after 5–10 years and indications of that have been reported in the few available 5 year RCT-reports following laser treatments. Treatment of recurrence due to stumps in the groin can be done safely within a reasonable operating time through a medial approach and the stump itself can generally not be treated with any of the endovenous alternative methods. Foam treatment can be used for most other recurrent veins but the durability is unknown. Endovascular thermal ablation can only be used for reopened or remaining saphenous veins and accessory saphenous veins while tributaries have to be treated by stab excisions or foam.

Conclusion: Long term reports of results of redo surgery are limited but suggest reasonably good results from open surgical intervention and are non-existent for the endovascular techniques. So far groin recurrence seems best treated surgically by an indirect approach, preferably medial. More studies are needed to find the best treatment regime for varicose vein recurrence in general and hybrid procedures might be the way forward by combinations of different techniques.

Schlüsselwörter
Varikose, Rezidivvarikose, endovenöse Behandlung, Venenchirurgie

Zusammenfassung
Einleitung: Obwohl die Rezidivvarikose häufig ist und 10 bis 30 % aller chirurgischer Eingriffe darauf entfallen, gibt es sehr wenige Studien, die dabei zur besten Behandlungsoption raten können. Mit der Einführung der minimal-invasiven endovenösen Behandlung gibt es eine Vielzahl möglicher Optionen neben den klassischen offenen chirurgischen Eingriffen.


Types of recurrence

There are various types of recurrences and these are listed in Table 1. The most common groin recurrences seem to be NV or recurrence due to improper primary surgery. There has been some disagreement regarding whether NV or bad primary surgery is the most common cause of recurrent varicose veins. In fact, both views seem to be correct depending on how you are looking at the problem. Promoters of NV as the major cause base their view on case series that were followed with repeated duplex assessments and there most series following open primary great saphenous vein (GSV) surgery show that NV is the dominating finding (7, 8). The relative contribution of NV is of course depending on how accurate the prior primary surgery was, and NV is greatly dominating in series where good primary surgery had been undertaken. The opposite, with a lower relative contribution of NV, is noted in series where primary surgery was less accurately performed. Although according to the literature duplex detected NV seldom leads to symptomatic recurrences requiring a redo procedure (1, 3, 9). A recent report has shown very low early recurrence following modern high ligation and stripping (10), leaving doubts regarding the quality of the open surgery performed in some RCTs reporting much higher recurrence rates at one year for open surgery.

The promoters of bad primary surgery as the principal cause have looked at the problem from a different angle. In those studies they looked at patients presenting with a symptomatic recurrence requiring a redo procedure (11–14). In these series around 70–80% is then caused by incomplete primary surgery, by technical or tactical errors. Remaining sapheno-femoral junctions (SFJs) causing stump formation seems to be the major reason following GSV surgery. So both ways of looking at the problem seems correct although they look at the problem from different angles. As it seems today NV is more of an innocent bystander whilst bad primary surgery seems to be the big villain when symptomatic recurrence is concerned (11, 14).

When endovascular techniques are concerned technical errors or insufficient technique seem to be dominating since NV appears less common at least after up to a median term follow-up (6). That it may appear later even after thermal techniques has, however, recently been reported (15). Following this it is questionable to equate recurrence from technical/tactical errors with NV since the former seems to be the major cause for symptomatic recurrence requiring a repeat intervention (11–14). Symptomatic recurrence from NV alone is much less frequent (1, 3, 9).

Prevention of recurrence

It is very difficult and today not possible to prevent recurrence completely since there are many types of recurrences. Disease progression is difficult to prevent, NV can be minimized by certain techniques but technical mistakes are probably, in most cases, preventable and the most important thing to minimize. When open GSV surgery is concerned the most common reasons for a recurrence are remaining stumps and remaining segments of saphenous veins or even sometimes intact entire saphenous veins.

To avoid this it seems important to stick to the old concept of performing a true high ligation at the level of the common femoral vein following a preoperative mapping with duplex. This requires good exposure and knowledge of the anatomy. Failure to do this seems to increase the risk of a symptomatic recurrence although it may take a decade to develop. It is also mandatory today to use duplex as a roadmap for...
the surgery planned to avoid mistakes (9) and duplex intra-operatively is also necessary for the endovenous procedures.

NV has been reduced in some series by patch techniques to cover the opening of the fascia (16) and over sewing the stump endothelium is another technique that has been claimed as effective (17, 18). A silicone patch technique was also shown effective although that lead to a few serious infectious complications limiting its general usability (19). It seems that a correctly performed primary intervention is the most effective way of avoiding a symptomatic recurrence and thus the surgeon seems to be the major risk factor for recurrence (3). This is probably true for all the primary treatment techniques.

The stump problem

When GSV surgery is concerned stumps formed by an intact SFJ seem to be the major reason for redo procedures. The difference between a stump recurrence and pure NV is shown in figure 1. Probably most such recurrences are caused by failure to ligate high enough, often leaving the anterior accessory vein or other tributaries in connection with the stump allowing substantial reflux down through these veins. A stump is generally considered present if the stump length is 5 mm or more on duplex.

On rare occasions a stump may probably be able to develop despite a flush high ligation by weakness in the vein wall in the area of the SFJ and might thus not always be possible to prevent. The problem of remaining stumps has largely been neglected and has been minimalized, without any real evidence, by proponents of endovascular techniques (13). The controversy of what is considered a successful duplex result following surgical treatment contrary to endovenous ablation is shown in figure 2. This ought to be a matter of more concern when more and more primary saphenous interventions are performed with endovenous techniques. It seems that the lesson learned from open GSV surgery has been disregarded completely despite overwhelming facts regarding stumps causing most of the recurrences requiring re-interventions (11–14).

Basically all endovenous techniques, laser, RF and foam are performed with the intention of leaving a stump in the groin, mainly because of fear of endovenous heat induced thrombosis (EHIT) and/or deep venous thrombosis (DVT). Short term this appears not to cause any problems although we know that it may take much longer for serious problems to appear. There are only a few reports from RCTs followed long term (5 years) comparing laser with open surgery, showing overall equal recurrence rates (20–23). However the majority of recurrences in the surgical arms were caused by NV whilst laser showed more incompetent SFJs and anterior accessory veins, which are more likely to become symptomatic. Interestingly, a low frequency of NV in the surgical arm was reported from the Danish study (22). It is necessary to follow this closely because it may develop into a huge problem and actually an increased demand for redo procedures in the future. From open surgery we have learned that it might take a decade or more to develop symptoms so we will probably be able to detect this during the next decade (13, 24).

How to deal with a recurrence?

There are surprisingly little data to guide us and there are merely case series, leaving some but insufficient knowledge. The options today include many more techniques than before when open surgery or liquid sclerotherapy were the main options. The strategy to treat is largely based on what kind of recurrence we are dealing with. Combinations of treatment techniques are a possibility today that may help to improve the outcomes.
Various techniques have their benefits and shortcomings and this is summarized in Table 2. The endovenous thermal techniques can be used for dealing with mainly fairly large and straight veins, such as re-canalized saphenous veins or new incompetence in accessory saphenous veins (25). Also perforating vein treatments are possible. Endo-thermal treatment of a remaining stump or serpentine tributaries is currently not advisable. Ultrasound guided sclerosing foam treatment appears as a more versatile choice that could be used for almost any type of recurrence apart from eradication of the actual stump, because the risk of DVT (26). Open surgery is most commonly used for stab phlebectomies also in combination with thermal ablation but can be used for most other types of recurrences apart from clusters of neovascularization. It is not ideal for redo perforator surgery where a SEPS technique appears a more safe choice (3).

Redo groin surgery has got a reputation of being difficult, time consuming and with a high risk of wound complications. It is however the only way of eradicating a stump completely, why it appears as the method of choice for most symptomatic groin recurrences. There are several techniques to operate a groin recurrence, where the direct approach through the scar tissue should be avoided because the risk of bleeding and lymphatic damage. There is also a lateral approach by first visualizing the artery and the femoral vein but the risk of lymphatic leakage has been reported high (27).

Another way is to make the incision high above the groin crease and locating the femoral vein and then following the vein down to the SFJ. Hach described access to the stump through a superior approach from the inguinal ligament („präfemorale Saphena magna Stumpfligatur“). Lastly there is the medial approach that has been reported to be fairly easily done with a low risk of complication (28). I have recently reported good one year results from a modified standardized medial approach with low risk of complications (29). That operation can be done in around 70 min, including stab phlebectomies and eventual stripping of remaining stem vein segments. You do not have to be an expert to use this technique. Figure 3 shows an isolated stump through a medial approach.

### Results from redo interventions

The literature is limited regarding the results of redo interventions and there are no comparative randomized studies that can guide us. Regarding redo groin surgery there are a few reports giving favourable results from using a medial approach (28, 29) whereas the lateral approach appears more difficult and risky (27). Foam has also been reported as a good short term treatment of GSV recurrence, although it appears to mostly have been used for remaining saphenous veins and accessory veins, probably without being able to occlude stumps (26). Regarding foam, its durability is being questioned.

Laser has been used for treating saphenous vein recurrence, apparently mostly for ablation of re-canalized or remaining saphenous veins (25). Two retrospective case series from the Netherlands showed that surgery was still used for the majority of saphenous vein recurrences (30, 31). The groups and treatments were obviously selected and the results therefore not comparable. The reports might indicate the usability of laser and surgery respectively in regard to recurrences. In a report from the UK (25) it was mostly used for retreatment of re-canalized GSVs, maybe indicating a high frequency of re-canalization from laser treatment in their area and a tradition of not performing stripping of the GSV.

We have a long term follow-up a median of 12 years following varicose vein surgery, where 28% were redo procedures (3). The redo procedures required more repeat procedures during follow-up but at the last follow-up the duplex detected recurrence rate was not significantly worse than following primary surgery, indicating a fairly good long term prognosis even after open redo procedures.

Regarding groin recurrences a medial approach to deal with a remaining stump seems to be a safe and fairly uncomplicated way of dealing with the problem. This combined with foam treatment distally to occlude incompetent accessory veins or remaining stem veins and associated tributaries looks like a promising combination. To test such a combination against foam treatment alone in a randomized trial would be of great interest for the future. Endothermal techniques seem to be of

### Table 2

<table>
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<th>Type of intervention</th>
<th>Duplex intraop</th>
<th>Anaesthesia</th>
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<th>Versatility</th>
<th>Costs</th>
<th>Documentation</th>
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<td>No</td>
<td>Yes/Yes</td>
<td>+++</td>
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more limited value in the recurrence situation since they are more costly and can be used mainly for remaining stem veins or accessory veins that are fairly straight and need to be combined with stub excisions or foam to deal with tributaries.

Perforator treatment

Incompetent perforators (IPs) are commonly encountered in patients with varicose vein recurrence and the value of treating IPs is under debate. The need for treatment is likely to increase with the number of IPs encountered and with the severity of venous disease. Open surgical treatment leads to more incisional wound complications and has been reported to produce quite high recurrence figures (32). SEPS has been proven to be safe and is the most documented technique although true evidence based results supporting the use of this technique are lacking (33, 34).

Newly emerged endovenous techniques such as foam, radiofrequency and laser, have shown high rates of immediate complications and has been reported to produce quite high recurrence figures (32). SEPS has been proven to be safe and is the most documented technique although true evidence based results supporting the use of this technique are lacking (33, 34).

For the future

Since new endovenous techniques are no better than average open surgery when recurrences are concerned we must improve our knowledge regarding treatment of recurrence. With the rapid spread of the popular endovenous techniques to deal with primary varicose veins it is mandatory to watch the long term outcomes following these treatments. Mainly this goes for what happens with the often called “physiologic stumps” left (38). If we are lucky they will not render as much symptomatic recurrence as stumps caused by inadequate surgery although available 5-year results from laser treatments tend to indicate the opposite (20–23). It will probably take another 5 years or more before we know for sure and it is crucial that we monitor and report treatment results correctly (39). If stumps from endovenous treatments act as stumps left from surgery we are likely to face a steadily increased demand for re-treatments.

But how should we best treat such recurrences? Today we really do not know the best treatment for recurrence and this is a virtually an untouched field for future research. If we do not start studying this problem we will not cope with the problem of recurrence in the future, which might become an even bigger problem than it is today. The treatment options have never been greater, which opens for a wider use of combined treatments, since the various techniques have their own strengths and weaknesses. Hybrid procedures to deal with not least varicose vein recurrence, tailored by each patient’s particular problems, might be the way forward. If we introduce endovenous techniques widely without knowing the long term results we need to be prepared to deal with the recurrences that appear with the most appropriate technique. We owe our patients to provide scientifically proven treatments also when recurrences are concerned.

References