

## CODEN [USA]: IAJPBB

ISSN: 2349-7750

# INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.2545876

Available online at: <u>http://www.iajps.com</u>

**Review Article** 

## SURGERY VARICOSE VEINS- RISK FACTOR AND MANAGEMENT Awaji Qasim Alnaami<sup>1</sup>, Abdulrahman Awaji Alna'ami<sup>2</sup>, Ahmad Hassan Hussain Alhazmi<sup>3</sup>, Mohamed Kheder Abdullah Alzahrani<sup>4</sup>, Sultan Ahmed M. Alburayk<sup>5</sup>, Ahmed Abdulrahman Alharbi<sup>6</sup>, Saad Abdullah Saad Albattal Almutairi<sup>7</sup>, Abdulrahman Waleed Bagar<sup>8</sup>, Abdulaziz Ibrahim Alhuthayli<sup>11</sup>, Faisal Musaad Fahad AlRasheed<sup>9</sup>, Khalid Mohsin Almaghribi<sup>10</sup>, Ibrahim Abdulmajeed Affan<sup>8</sup> <sup>1</sup>Consultant General Surgery, Sabya General Hospital-Jazan, Awaji10@hotmail.com,

0504578022, <sup>2</sup>King Fahad Central Hospital In Jazan, <sup>3</sup>King Khalid University, <sup>4</sup>King Abdullah Medical Complex, <sup>5</sup>King Salman Hospital, <sup>6</sup>King Abdulaziz Hospital, <sup>7</sup>Dawadmi General Hospital, <sup>8</sup>Ibn Sina National College For Medical Studies, <sup>9</sup>Prince Muteb Bin Abdulaziz Hospital ,<sup>10</sup>King Hamad University Hospital, <sup>11</sup>King Khalid Hospital

#### Abstract:

Introduction: Varicose vein is considered one of the common diseases that affect a momentous number of population and worsen the quality of their lives (QoL). surgical treatment of superficial venous incompetence was considered the mainstay of intervention. This surgical method is inspired from the early works far away back to 1550 BC when monographs of venous disease and their surgical treatment appear, that Celcus, in first century Rome, suggest the concept of ligation and division of bleeding varicosities, and in the second century, Galen presented ligation and vein avulsion by using specific hooks. however, currently these surgical methods are clearly drawbacks due to the new endovenous thermal ablation method, by using radiofrequency ablation (RFA), endovenous laser ablation (EVLA), furthermore the use of foam sclerotherapy which has been improved recently. Even The National Institute of Health and Clinical Excellence (NICE) guidelines (United Kingdom) on the management of varicose veins recommend endothermal ablation as the first option to consider, transferring surgery only to a third-line alternative.

Although the new endothermal methods are reachable, the best choice for long-term management of varicose veins and guarantee the best outcomes is still in doubt.

Aim of work: In this review, we will discuss Surgery varicose veins- risk factor and management

**Methodology:** We searched PubMed (http://www.ncbi.nlm.nih.gov/) and Google Scholar (https://scholar.google.com). using search terms: Surgery, varicose veins, risk factor, and management. For Surgery varicose veins- risk factor and management .We just included the full articles and all relevant studies were retrieved and discussed.

**Conclusions:** Surgical treatment for varicose veins is a proven intervention providing good anatomic success and instantaneous elimination of the cause of superficial incompetence. On the other hand, defect in its results clinically and in QoL scores also with slower improvement noted, made its use contracted, furthermore, it often results in a delay recovery period, and lead to serious complications. They proved that the cost of surgical intervention is also less cost-effective treatment option compared to the endovenous methods. The choice of varicose vein treatment to use in current practice is dictated by its cost-effectiveness, thereby, making surgery increasingly harder to justify. Even though surgery still effective method to treat venous incompetence, improve its outcomes can be achieved by doing some modifications on the technique and hopefully make it a more cost-viable alternative. Hence, endovenous ablation, most specifically endothermal methods, will be around for the foreseeable future, unless the newer non-thermal, nontumescent (NTNT) methods prove to be more advantageous.

Key words: Surgery, varicose, veins- risk factor, and management.

## Awaji Qasim Alnaami et al

**ISSN 2349-7750** 

## **Corresponding author:**

Awaji Qasim Alnaami,

Consultant General Surgery, Sabya General Hospital-Jazan, <u>Awaji10@hotmail.com</u>, 0504578022.



Please cite this article in press Awaji Qasim Alnaami et al., Surgery Varicose Veins- Risk Factor And Management., Indo Am. J. P. Sci, 2019; 06(01).

#### **INTRODUCTION:**

Varicose vein is considered one of the common diseases that affect a momentous number of population and worsen the quality of their lives (QoL). [1] surgical treatment of superficial venous incompetence was considered the mainstay of intervention. This surgical method is inspired from the early works far away back to 1550 BC when monographs of venous disease and their surgical treatment appear, that Celcus, in first century Rome, suggest the concept of ligation and division of bleeding varicosities, and in the second century, Galen presented ligation and vein avulsion by using specific hooks. [2] however, currently these surgical methods are clearly drawbacks due to the new endovenous thermal ablation method, by using radiofrequency ablation (RFA), endovenous laser ablation (EVLA), furthermore the use of foam sclerotherapy which has been improved recently. Even The National Institute of Health and Clinical Excellence (NICE) guidelines (United Kingdom) on the management of varicose veins recommend endothermal ablation as the first option to consider, transferring surgery only to a third-line alternativenation [3].

Although the new endothermal methods are reachable, the best choice for long-term management of varicose veins and guarantee the best outcomes is still in doubt.

So, in this review, we will discuss the most recent evidence regarding Surgery varicose veins- risk factor and management

## **METHODOLOGY:**

We searched PubMed (http://www.ncbi.nlm.nih.gov/) and Google Scholar (https://scholar.google.com). using search terms: Surgery, varicose veins, risk factor, and management. For Surgery varicose veinsrisk factor and management .We just included the full articles and all relevant studies were retrieved and discussed.

## Anatomical success

Nowadays the surgical procedure for treatment of varicose vein disease aim to eliminate the reflux in the offending vein. Which done under general or regional anesthesia by ligation of the saphenofemoral junction (SFJ) (high ligation) or saphenopopliteal junction (SPJ) with or without stripping of the truncal vein.

The researchers discovered that the procedure with ligation and stripping is better than ligation alone. Dwerryhouse et al. [4] showed that the rate of reoperation in patients undergo ligation alone for GSV incompetence is higher than patients undergo ligation and stripping for the same surgery. This was a randomised study comparing ligation of sapheno-femoral (SFJ) only to SFJ ligation and stripping, after 5 years follow up the rate of reoperation was 17% in patients undergoing ligation only and 4% in those also having stripping.5 then after 11 years, according to the corresponding figures, reoperation rate was 29% in the ligation only group and 11% in the ligation and stripping group. [5]

Another comparison was discussed is the occlusion rate between surgical and endovenous management of varicose veins which have revealed some conflicting results.

In the EVOLVeS randomised controlled trial comparing RFA to surgery, in the form of high ligation and stripping (HL/S), Lurie et al.<sup>6</sup> recruited 85 patients then followed them for 2 years. At the end of the study period, they found that both treatment modalities have equivalent closure rates. But another RCT (advanced studies) also comparing RFA and HL/S found that endothermal ablation was better than surgery. With 93 patients (98% CEAP class C2-3) randomised and treated as day-cases, all the patients receiving RFA had complete their treatment successfully comparing to 88% in those having surgery. [6]

Rasmussen et al. [7] compared another endothermal ablation technique (EVLA) to surgery (HL/S) in patients with C2-4 disease. He followed his participants for five years, firstly, after 6 months he found that the occlusion rate was 98% in the ligation and stripping group and 94.4% in the EVLA group. Then after 5 years, the cases of open, refluxing GSVs were higher in the EVLA group compared to the surgery group (18% vs. 10%; p<sup>1</sup>/<sub>4</sub>NS), whereas recurrent varicose veins in the surgery group were somewhat more than the EVLA group (54.6% vs. 46.6%; p<sup>1</sup>/<sub>4</sub>NS). [8] nevertheless the reoperation rate was comparable (38.6% in EVLA and 37.7% in surgery; p<sup>1</sup>/<sub>4</sub>NS).

In another study compares endovenous laser treatment and surgery (high ligation and stripping) revealed that after 3 months of follow up the occlusion rate was 94% in the thermal ablation group compared to 87.5% in the surgical group. [9]

Christenson et al. in his prospective randomised control trial study compared EVLA to surgery (HL/S). there were 204 randomised patients, 97% of whom were in CEAP class C2-C4. They showed that, after 1 year and 2 years of follow up, the GSV was absent in all patients who had surgery. Furthermore, in the EVLA group, there were seven cases of treatment failure (five partial reopening and two complete reopening), but this did not reach significance (p<sup>1</sup>40.51). [10]

Rasmussen et al compared the endothermal methods (RFA and EVLA), high ligation and stripping and ultrasound-guided foam sclerotherapy (UGFS).13 they recruited 500 patients in a randomized manner which 95% of these patients were of CEAP class C2-3. They found that, the failure rates (defined as an open segment of more than 10 cm in length) at 1 year was 5.8% (RFA), 4.8% (EVLA), 4.8% (surgery) and 16.3% (UGFS). [11]

Long-term follow-up for RFA approves the efficiency of this endothermal method.

A global, prospective, multicenter study is done to explore the effects of RF segmental thermal ablation on the GSV in 225 patients (295 limbs) by Proebstle et al.14 after 5 years, they found the GSV occlusion rates were 91.9%, whereas 94.9% of GSVs were reflex free. 14 A comparison between EVLA, UGFS, and surgery conducted by Biemans et al.15. This was a randomised control trial that more than 90% of his participants were had a CEAP lass C2-C4. After 1 year, the anatomic success rate was (88.5% vs. 88.2%) for EVLA and surgery which were comparable, however, it was (72.7%) for UGFS. After 5 years, they found that, 85% of the participants undergo surgery their GSV was effectively treated, 77% in the EVLA group and 23% in the UGFS group (p<0.001).16 also at 5 years, they noticed that, closure of the above-knee GSV is four times more likely to happen in patients undergoing surgery or EVLA comparing to patients in the UGFS group. [12]

The CLASS trial is a multicenter study comparing foam sclerotherapy, surgery, and EVLA. It has recruited 795 patients (96% of them in CEAP class C2-C4), after 6 months there were significantly higher closure rates in patients undergoing surgery (84.4%) or EVLA (83.0%) than those receiving foam sclerotherapy (53.6%; p<0.001) (no significant differences in closure rates between EVLA and surgery). [13]

As a result of the previous studies, although the new endothermal methods are advanced and accessible, surgery is still a durable method and comparable to endothermal one, furthermore, it is superior to UGFS. However, anatomical success is considered more of a replacement outcome measure and the findings do not suggest any indications as to the clinical or functional outcome following varicose vein intervention.

#### Clinical and QoL measures

Mackenzie and colleagues [14] studied the consequence of surgery on QoL. They recruited 203 patients to undergo surgery for varicose vein. The results were detected at 4 weeks, 6 months and 2 years. At the 4 weeks, they found that the Aberdeen Varicose Vein Symptom Severity Score (AVVSSS) was lower (improved) but this result was not significant (Wilcoxon signed rank test, p<sup>1</sup>/<sub>4</sub>0.44) while after 6 months and 2 years of the procedure the improvement became significant with . Also, they found that there was a correlation between the proportions of GSV removed in the thigh and gains in QoL at 6 months and 2 years after the procedure. [15] They established that there is an improvement in OoL, this improvement starts at 4 weeks from the intervention and continues for as long as 2 years.

Another study detected the outcomes after a few days or weeks after intervention, EVOLVeS study, they used the Venous Clinical Severity Score (VCSS) for a clinical score, they found that recovery at 3 days and 1 week of the intervention was significantly more rapid in patients undergoing endothermal ablation (RFA) than patients undergoing surgery. Even though that difference disappeared by the third week. furthermore the global QoL score (using CIVIQ2) revealed a worsening of the QoL in surgery over the first few weeks and was still present by the end of the 2 years follow-up.

Rasmussen and colleagues'10 also studied the early

difference in clinical score using VCSS for a clinical score, which they found the VCSS worse in patients undergoing surgery compared to those having EVLA but this difference disappeared at the end of the first month. For OoL, as measured using the AVVSS. there was a significant improvement in both groups from the 3- month point onwards. 10 On the other hand, there are some other studies, do not demonstrate such difference in clinical or QoL scores. Christenson et al. [16] did a randomized control trial compared EVLA with surgical intervention and demonstrated that the improvement was equivalent, even though the EVLA group having a higher incidence of recurrence with symptoms. Shadid et al. also carried out an RCT comparing UGFS and surgery in the treatment of incompetent GSV. After 2 years of follow up, using VCSS or the EuroQoL's EQ-5D scores, there was no difference apparent between tow groups. the MAGNA trial, using CIVIQ and EQ-5D scores, also found that there was no discrepancy in the improvement between all groups (EVLA, UGFS, and surgery) at 3 months and remaining stable In the CLASS trial, Brittenden et al. recruited 785 patients, randomising them to foam sclerotherapy, surgery or EVLA. At 6 weeks, they found that higher VCSS score in those undergoing surgery (and EVLA) compared to those receiving foam sclerotherapy (1.8 vs 2.2; p<0.001). But at 6 months this difference was no longer existing. Moreover, at 6 months, using AVVQ, they found that the participant undergoing surgery had better QoL compared to foam sclerotherapy (7.8 vs. 9.1; p<0.01).

Post-procedure recovery is vary, whereas it was showed to be longer in surgical one. Lurie and his colleagues [17] found the mean recovery after surgery was 3.89 days compared to a mean of 1.15 days for RFA (p<sup>1</sup>/40.2), and comparing to EVLA the mean recovery was 4.7 days after their RFA and 12.4 days after having surgery, a similar picture becomes apparent. Darwood11 and Subramonia's studies.8 also illustrated parallel differences in return to activities.

Rasmussen et al. noticed the same, which recovery in patients undergoing surgery is longer than endovenous methods (median 4 days compared to less than 2 days for the endovenous methods). Such a difference was no longer apparent though when the time to return to work was looked at with patients returning to work a median 4.3 days following surgery compared to 3.6 days for EVLA.13

#### Complications

wound infections, haematoma formation, recurrence,

numbness, paraesthesia, neuralgia, lymphatic damage, major vessel injury, residual veins and venous thromboembolism (deep vein thrombosis (DVT) and pulmonary embolus (PE)) are the common complications followed surgery. [18] Rasmussen et al. documented in their randomized control trial one incidence of DVT, five cases of paraesthesia and six of hyperpigmentation in patients undergoing surgery.

Paraesthesia and hyperpigmentation had the same rate in surgery and endovenous interventions. But the incidence of phlebitis was significantly higher in the endovenous ablation methods. bruising another complication was noticed by Christenson et al. in the surgical group which was 15 compared to the EVLA group 2. No cases of wound infection or DVT were reported.

Another issue was discussed wound infection requiring systemic antibiotics, which demonstrated in the MAGNA study, they showed that the patients undergoing surgery had a significantly higher number of wound infection requiring systemic antibiotics (p<sup>1</sup>/40.03). The overall rate of complications was also higher with surgery, but this was not significant  $(p^{1}/40.64)$ . On the other hand. In the CLASS trial. found the overall complications rate in the patients undergoing surgery were similar to UGFS and EVLA (3.5%, 3.8%, and 3.3%, respectively) and similar serious adverse events related to treatment with the endovenous procedures (1.4%). A rather high incidence of numbness (15.6%) and persistent bruising (17.0%) was found to be still present at 6 months.

#### **Cost-effectiveness**

studies focused cost-effective Multiple on interventions to accomplish the best outcomes in varicose vein disease management. Rasmussen et al. One of the randomised trial compared the cost of each EVLA, RFA, UGFS, and surgery based on the reimbursement rates and productivity level in Denmark. The higher intervention cost was both in surgery and EVLA, whereas Foam sclerotherapy was found to be the cheapest. The National Institute of Health and Care Excellence (NICE, United Kingdom) uses a threshold of \_20,000 to indicate the cost-effectiveness of treatments in the National Health Service (NHS). The CLASS trial, when compared the cost-effective treatment for varicose veins in EVLA vs surgery, they noticed that the highest probability of being the most cost-effective treatment was EVLA.

Cost-effectiveness analysis conducted by NICE itself

showed that surgery produced fewer gains in quality of life years (QALYs) at an increased cost compared to the endothermal methods. [19] Despite being more costly than foam sclerotherapy, endothermal ablation was also found to produce the greatest QALY gain and was the most clinically effective treatment. The incremental cost-effectiveness ratio (ICER, difference in cost between two possible interventions, divided by their effect) was in favour of endothermal ablation, making this method the most cost-effective strategy in treating varicose veins.

#### **CONCLUSIONS:**

Surgical treatment for varicose veins is a proven intervention providing good anatomic success and instantaneous elimination of the cause of superficial incompetence. On the other hand, defect in its results clinically and in QoL scores also with slower improvement noted, made its use contracted, furthermore, it often results in a delay recovery period, and lead to serious complications. They proved that the cost of surgical intervention is also less cost-effective treatment option compared to the endovenous methods. The choice of varicose vein treatment to use in current practice is dictated by its cost-effectiveness. thereby. making surgerv increasingly harder to justify.

Even though surgery still effective method to treat venous incompetence, improve its outcomes can be achieved by doing some modifications on the technique and hopefully make it a more cost-viable alternative. Hence, endovenous ablation, most specifically endothermal methods, will be around for the foreseeable future, unless the newer non-thermal, nontumescent (NTNT) methods prove to be more advantageous.

#### **REFERENCES:**

- 1. Callam MJ.1994 Epidemiology of varicose veins. Br J Surg 1994; 81: 167–173.
- Ombrellino M and Kabnick LS.2005 Varicose vein surgery. Sem Intervent Radiol 2005; 22: 185–194.
- 3. National Institute of Clinical Excellence.2013 NICE Clinical Guideline Centre. Varicose veins in the legs - the diagnosis and management of varicose veins (Clinical guideline 168). NICE, 2013.
- 4. **Dwerryhouse S, Davies B, Harradine K, et al.1999** Stripping the long saphenous vein reduces the rate of reoperation for recurrent varicose veins: five-year results of a randomized

trial. J Vasc Surg 1999; 29: 589-592.

- Winterborn RJ, Foy C and Earnshaw JJ.2004 Causes of varicose vein recurrence: late results of a randomized controlled trial of stripping the long saphenous vein. J Vasc Surg 2004; 40: 634– 639.
- 6. Lurie F, Creton D, Eklof B, et al.2005 Prospective randomised study of endovenous radiofrequency obliteration (closure) versus ligation and vein stripping (EVOLVeS): twoyear follow-up. Eur J Vasc Endovasc Surg 2005; 29: 67–73.
- 7. Rasmussen LH, Bjoern L, Lawaetz M, et al.2007 Randomized trial comparing endovenous laser ablation of the great saphenous vein with high ligation and stripping in patients with varicose veins: short-term results. J Vasc Surg 2007; 46: 308–315.
- Rasmussen L, Lawaetz M, Bjoern L, et al.2013 Randomized clinical trial comparing endovenous laser ablation and stripping of the great saphenous vein with clinical and duplex outcome after 5 years. J Vasc Surg 2013; 58: 421–426.
- 9. Darwood RJ, Theivacumar N, Dellagrammaticas D, et al.2008 Randomized clinical trial comparing endovenous laser ablation with surgery for the treatment of primary great saphenous varicose veins. British Journal of Surgery 2008; 95: 294–301.
- 10. Christenson JT, Gueddi S, Gemayel G, et al.2010 Prospective randomized trial comparing endovenous laser ablation and surgery for treatment of primary great saphenous varicose veins with a 2-year follow-up. J Vasc Surg 2010; 52: 1234–1241.
- 11. Rasmussen LH, Lawaetz M, Bjoern L, et al.2011 Randomized clinical trial comparing endovenous laser ablation, radiofrequency ablation, foam sclerotherapy and surgical stripping for great saphenous varicose veins. The British Journal of Surgery 2011; 98: 1079–1.
- 12. van der Velden SK, Biemans AA, De Maeseneer MG, et al. Five-year results of a randomized clinical trial of conventional surgery, endovenous laser ablation and ultrasound-guided foam sclerotherapy in patients with great saphenous varicose veins.
- 13. Brittenden J, Cotton SC, Elders A, et al.2014

A randomized trial comparing treatments for varicose veins. The New England journal of medicine 2014; 371: 1218–1227.

- 14. Mackenzie RK, Lee AJ, Paisley A, et al.2002 Patient, operative, and surgeon factors that influence the effect of superficial venous surgery on disease-specific quality of life. J Vasc Surg 2002; 36: 896–902.
- 15. MacKenzie RK, Paisley A, Allan PL, et al.2002 The effect of long saphenous vein stripping on quality of life. J Vasc Surg 2002; 35: 1197–1203.
- 16. Christenson JT, Gueddi S, Gemayel G, et al.2010 Prospective randomized trial comparing endovenous laser ablation and surgery for treatment of primary great saphenous varicose veins with a 2-year follow-up. J Vasc Surg 2010;

52: 1234–1241.

- 17. Lurie F, Creton D, Eklof B, et al.2003 Prospective randomized study of endovenous radiofrequency obliteration (closure procedure) versus ligation and stripping in a selected patient population (EVOLVeS Study). J Vasc Surg 2003; 38: 207–214.
- Critchley G, Handa A, Maw A, et al.1997 Complications of varicose vein surgery. Ann R Coll Surg Engl 1997; 79: 105–110.
- 19. Marsden G, Perry M, Bradbury A, et al.2015 A cost-effectiveness analysis of surgery, endothermal ablation, ultrasound- guided foam sclerotherapy and compression stockings for symptomatic varicose veins. Eur J Vasc Endovasc Surg 2015; 50: 794–801.