CLINICAL PROFILE AND MANAGEMENT OF LOWER LIMB VARICOSE VEINS

Hemant B. Janugade1, Bhushan Pralhad Patil2, Neville Hoshedar Tata3, Harshawardhan Vidyasagar Saygaonkar4, Deepali Hemant Janugade5, Vivek Dokania6

1Professor, Department of General Surgery, Krishna Institute of Medical Sciences University, Karad, Maharashtra.
2Resident, Department of General Surgery, Krishna Institute of Medical Sciences University, Karad, Maharashtra.
3Resident, Department of General Surgery, Krishna Institute of Medical Sciences University, Karad, Maharashtra.
4Resident, Department of General Surgery, Krishna Institute of Medical Sciences University, Karad, Maharashtra.
5Assistant Professor, Department of Obstetrics and Gynaecology, Krishna Institute of Medical Sciences University, Karad, Maharashtra.
6Resident, Department of ENT, Krishna Institute of Medical Sciences University, Karad, Maharashtra.

ABSTRACT

BACKGROUND
The first written reference of varicose veins appears to be the Ebers Papyrus dated 1550 B.C. It is one of the oldest documented pathological conditions in existence today. This study deals with its aetiology, pathology and the different modes of treatment and their efficacy in detail.

MATERIALS AND METHODS
50 patients with lower limb varicose veins admitted in the Department of General Surgery, KIMS, Karad from October 2014 to July 2016 were included in the study. All patients were subjected to detailed history taking, clinical examination and relevant investigations. Depending on the merits of the disease, appropriate treatment options are selected. All the results are evaluated and analysed by comparing with other standard results.

RESULTS
In this study, there were 34 males and 16 females (M:F = 2.1:1). Most of the patients were between 20 - 50 yrs. of age (80%); 56% of patients had occupations, which involved prolonged standing. In this study, 48% of patients had positive family history. The most common presenting complaint was prominent veins (100%) and pain in 54% of patients. Right limb was involved in 38% and the left limb involved in 52% of patients. Long saphenous vein was involved in 98% of patients, the second commonest being perforators which were involved in 86% of patients. Majority of the patients had combined saphenofemoral and perforator incompetence (70%). Duplex ultrasound was very accurate in diagnosing perforator incompetence. Treatment was depended upon the individual cases. In patients with venous ulcers Biggaard’s method of treatment was followed till the ulcer heals and then the patient was subjected to further definitive treatment. SFJ ligation with stripping was the most common surgery performed. Among post-operative complications, wound infection was the most common (14%).

CONCLUSION
This study showed that the prevalence of varicose veins of lower limb have a male predominance and is more common in younger age group. Family history and occupation are important contributing factors in the development of lower limb varicose veins. Left lower limb involvement is more than the right. Duplex ultrasound is the investigation of choice of lower limb varicose veins. Saphenofemoral flush ligation with stripping is very effective in the treatment of varicose veins.

KEYWORDS
Varicose Veins, Lower Limb Pain, Venous Ulcer, Haemorrhage, Aetiology, Duplex Ultrasound, Saphenofemoral Flush Ligation, Stripping, Complications.


BACKGROUND
Varicose veins and their associated symptoms and complications constitute the most common chronic vascular disorder of the lower limb. The term varicose is derived from the Latin word meaning dilated. Varicose veins is defined as dilated, tortuous and elongated veins.

Varicose veins are a common medical condition present in at least 10% of the general population.1 The symptoms of varicose veins range from asymptomatic varicose veins to more severe complications, such as ulceration and bleeding.

Varicose veins may cause significant morbidity including dermatitis, ankle oedema, spontaneous bleeding, superficial thrombophlebitis, lipodermatosclerosis and ulceration.

Varicose veins were recognised pre-historically and many inventions were made regarding the diagnosis and treatment of varicose veins by many phlebologists including many bandaging techniques, ligation and stripping of veins. The attention was mainly towards the mechanical effects of the varicosity rather than the basic cause. It is only in the recent past that considerable knowledge has been gained concerning the anatomy of the venous system of the leg, the physiological mechanism of venous return to the heart.
against gravity and pathology of the disorder, which has led to many newer modalities of investigations and treatment.

The Doppler ultrasound and duplex imaging have become the mainstay of investigations in the diagnosis of chronic venous insufficiency.\(^2\)

The treatment options for varicose veins include Trendelenburg operation, Stripping, Subfascial ligation of perforators, Laser, Sclerotherapy, Subfascial endoscopic perforator surgery and Radiofrequency ablation. In the recent past, minimally invasive procedures are replacing the more invasive procedures.

The search for more effective means of diagnosing and treating varicose veins and prevention and management of its complications continues and this article aims at studying the distribution, pathology, clinical features, various modes of investigations and overall management of varicose veins of lower limbs.

**Aims and Objectives**

1. To study the distribution, pathology and clinical features of varicose veins of lower limbs in rural areas.
2. To study the various modes of investigations and management of varicose veins in the lower limbs effectively and to prevent complications.

**MATERIALS AND METHODS**

**Source of Data**

This study includes all the patients admitted with lower limb varicose veins to Surgical Department of Krishna Institute of Medical Sciences, Karad from October 2014 to June 2016.

**Sample Size**

Total number of patients were 50. All the cases were admitted to the hospital and evaluated by taking detailed history and by carrying out thorough clinical examination. The findings were recorded in clinical proforma.

**Collection of Data**

**Inclusion Criteria**

**General Criteria for Selection of the Cases in the Study were as Follows**

1. Symptomatic varicose veins with symptoms of aching, heaviness and cramps.
2. Complications of venous stasis such as pigmentation, dermatitis, ulceration and superficial thrombophlebitis.
3. Large varicosities subject to trauma.
4. Cosmetic concern.

**Specific Criteria - Patients with Primary Varicosities of**

1. Long Saphenous vein.
2. Short Saphenous vein.
3. Perforator incompetence.

**Exclusion Criteria**

All those who were treated on outpatient basis were not included in the study. Patient with secondary varicose veins due to venous obstruction were also not included in the study.

Informed consent was obtained from each patient before any investigations. Thorough physical examination was done by investigator himself by using the aforementioned clinical tests and confirmed by doing special non-invasive investigations such as Duplex ultrasound.

**Investigations**

**Routine Investigations and Special Investigations Like**

1. Doppler of venous system.
3. Plain x-ray of affected part in case of venous ulcer, particularly in presence of signs of infection for evidence of periostitis.

**Treatment**

**Conservative Treatment**

A course of conservative treatment was given whenever indicated with rest, antibiotics and elastocrepe bandage.

**Surgical Treatment**

Following surgical treatment were carried out in our Institute.

1. Trendelenburg’s operation.
2. Stripping of long saphenous vein.
3. Subfascial or extrafacial ligation of perforators.
4. Multiple stab avulsions of long saphenous vein.
5. Saphenopopliteal junction ligation.

**Data Analysis**

The postoperative course was noted; minor complications were attended and treated accordingly. Patients were followed up further. Final outcome evaluated. All the clinical data of each patient were recorded in the pre-coded clinical proforma designed for the study.

Important data pertaining to each case is shown in the master chart and the results are analysed by comparing with standard results of known Authors. Ethical clearance was taken from our Institute for the study.

**RESULTS**

Varicose veins appear to be common among the general population, but the incidence of hospital admission does not project the true prevalence rate. The hospitalised group is only a tip of the iceberg. An epidemiological study can give its true incidence in the general population.

A total of 50 patients (55 number of limbs) with primary varicose veins admitted in surgical ward of Krishna Institute of Medical Sciences, Karad, were studied and following findings were noted and analysed.

**Sex Distribution**

The Indian male appears to be more prone to the development of varicosity of veins of lower limb than the females.

<table>
<thead>
<tr>
<th>No. of Cases Studied</th>
<th>No. of Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>34</td>
<td>68%</td>
</tr>
<tr>
<td>Females</td>
<td>16</td>
<td>32%</td>
</tr>
</tbody>
</table>

**Table 1. Sex Distribution**
Majority of the patients in the study were less than 50 years. So, it is the disease which affects the youth and the bread-earning members of the society.

**Occupation**
Occupation has a definite role to play as a causative factor. Varicose veins are common in person, whose occupation demands prolonged standing. It is the part of the penalty for adopting an erect posture.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupation Involving Prolonged Standing</td>
<td>35%</td>
<td>44%</td>
<td>56%1</td>
</tr>
</tbody>
</table>

In this study, 56% of patients belong to the group whose occupation involved prolonged standing.

**Family History**
Among 50 cases studied, 24 cases had family history of close relatives suffering from varicose veins. The occurrence of varicose veins in several members of the family suggests that hereditary factors may be an important cause of varicosity. Many other worker’s studies have agreed with this, but in all studies relatives, were not assessed clinically; only importance was given to the history furnished by the patient.

<table>
<thead>
<tr>
<th>Varicose Vein</th>
<th>No. of Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>24</td>
<td>48%</td>
</tr>
<tr>
<td>Absent</td>
<td>27</td>
<td>54%</td>
</tr>
</tbody>
</table>

In this study, 56% of patients belong to the group whose occupation involved prolonged standing.
In this study 48% of patients had positive family history, which is one of the important risk factor for the development of varicose veins.

Clinical Manifestations

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Present Series</th>
<th>Rudofsky G. Langen Beck Arch Chir (%)</th>
<th>O'Shaughnessy M et al (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prominent Veins</td>
<td>50</td>
<td>100.00</td>
<td>90.00</td>
</tr>
<tr>
<td>Prominent Veins and Pain</td>
<td>27</td>
<td>54.00</td>
<td>30.00</td>
</tr>
<tr>
<td>Prominent Veins and Oedema</td>
<td>29</td>
<td>58.00</td>
<td>52.00</td>
</tr>
<tr>
<td>Pigmentation and Lipodermatosclerosis</td>
<td>14</td>
<td>28.00</td>
<td>13.00</td>
</tr>
<tr>
<td>Venous Ulceration</td>
<td>6</td>
<td>12.00</td>
<td>9.00</td>
</tr>
<tr>
<td>Previous History of DVT</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The majority of the patients (38%) belonged to clinical class II of CEAP classification. The 62% of patients had complications of varicose veins.

Limb Involvement

<table>
<thead>
<tr>
<th>Limb Involved</th>
<th>Present Series</th>
<th>A.H.M. Dur, A.J.C. Mackaay et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right</td>
<td>19</td>
<td>38%</td>
</tr>
<tr>
<td>Left</td>
<td>26</td>
<td>52%</td>
</tr>
<tr>
<td>Both</td>
<td>05</td>
<td>10%</td>
</tr>
</tbody>
</table>

Venous System Involved

<table>
<thead>
<tr>
<th>System Involved</th>
<th>Limbs</th>
<th>%</th>
<th>Al-Mulhim et al, King Fahad Hospital (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Saphenous Vein</td>
<td>49</td>
<td>98%</td>
<td>68.42</td>
</tr>
<tr>
<td>Short Saphenous Vein</td>
<td>9</td>
<td>18%</td>
<td>7.02</td>
</tr>
<tr>
<td>Both</td>
<td>8</td>
<td>16%</td>
<td>24.56</td>
</tr>
<tr>
<td>Perforators</td>
<td>43</td>
<td>86%</td>
<td>87.29</td>
</tr>
</tbody>
</table>
As the long saphenous vein extends along the whole length of the limb, it bears the brunt of the erect posture. The long saphenous vein was involved in 98% of cases, the second victim being the perforators, which was involved in 88% of cases. The short saphenous vein involvement in the present series was 18%. Other workers also confirm this fact.

### Sites of Incompetence

<table>
<thead>
<tr>
<th>Sites of Incompetence</th>
<th>Number of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saphenofemoral Alone</td>
<td>05</td>
<td>10%</td>
</tr>
<tr>
<td>Saphenofemoral + Perforators</td>
<td>35</td>
<td>70%</td>
</tr>
<tr>
<td>Saphenofemoral + Saphenopopliteal + Perforator Incompetence</td>
<td>07</td>
<td>14%</td>
</tr>
<tr>
<td>Perforators Alone</td>
<td>01</td>
<td>02%</td>
</tr>
<tr>
<td>Saphenofemoral + Saphenopopliteal Incompetence</td>
<td>01</td>
<td>02%</td>
</tr>
<tr>
<td>Saphenopopliteal Incompetence</td>
<td>01</td>
<td>02%</td>
</tr>
</tbody>
</table>

**Table 12. Sites of Incompetence**

Most patients (70%) had saphenofemoral and perforator incompetence. Isolated perforator incompetence was seen only in 2% of patients; 14% patients present with combined saphenofemoral, saphenopopliteal and perforator incompetence.

### Duplex Ultrasound

<table>
<thead>
<tr>
<th>Findings</th>
<th>Clinical Examination</th>
<th>Duplex USG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saphenofemoral Incompetence</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Saphenopopliteal Incompetence</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Perforator Incompetence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Above Knee Perforators</td>
<td>00</td>
<td>01</td>
</tr>
<tr>
<td>Below Knee Perforators</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>Lower Leg Perforators</td>
<td>06</td>
<td>06</td>
</tr>
<tr>
<td>Multiple Perforators</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>Deep Venous Thrombosis</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 15. Correlation between Clinical Examination v/s Duplex Ultrasound**

### Surgical Procedures

<table>
<thead>
<tr>
<th>Surgical Procedures</th>
<th>Limb</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saphenofemoral Flush Ligation + Stripping</td>
<td>22</td>
<td>44%</td>
</tr>
<tr>
<td>Saphenofemoral Flush Ligation + Stripping + Multiple Stab Avulsion</td>
<td>04</td>
<td>08%</td>
</tr>
<tr>
<td>Saphenofemoral Flush Ligation + Stripping + Subfascial Ligation</td>
<td>14</td>
<td>28%</td>
</tr>
<tr>
<td>Saphenofemoral Flush Ligation + Stripping* + Saphenopopliteal Ligation</td>
<td>03</td>
<td>06%</td>
</tr>
<tr>
<td>Saphenofemoral Flush Ligation + Stripping* + Saphenopopliteal Ligation + Subfascial Ligation</td>
<td>05</td>
<td>10%</td>
</tr>
<tr>
<td>Saphenopopliteal Ligation Alone</td>
<td>01</td>
<td>02%</td>
</tr>
<tr>
<td>Multiple Stab Avulsion Alone</td>
<td>01</td>
<td>02%</td>
</tr>
</tbody>
</table>

**Table 16. Surgical Procedures Performed**
Graph 14. Surgical Procedure Performed

SFFL - Saphenofemoral Flush Ligation  
STRP - Stripping  
SFL - Subfascial Ligation  
MSA - Multiple Stab Avulsion  
SPL - Saphenopopliteal Ligation

Both studies showed that Trendelenburg's operation with stripping offered very effective results.

Complications

<table>
<thead>
<tr>
<th>Complications</th>
<th>Number of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound Infection</td>
<td>07</td>
<td>14%</td>
</tr>
<tr>
<td>Haematoma</td>
<td>04</td>
<td>08%</td>
</tr>
<tr>
<td>Saphenous Neuritis</td>
<td>04</td>
<td>08%</td>
</tr>
<tr>
<td>Wound Dehiscence</td>
<td>03</td>
<td>06%</td>
</tr>
<tr>
<td>Lymphorrhoea</td>
<td>02</td>
<td>04%</td>
</tr>
<tr>
<td>Femoral Vein Injury</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Femoral Artery Injury</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Deep Vein Thrombosis</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pulmonary Embolism</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 18. Complications of Surgery

In the present study, some minor complications occurred which were managed conservatively. The study conducted by Hagmüller G. M. showed incidence of some major complications which are very rare and none of which occurred in the present study group.

DISCUSSION

Varicosity of the lower limb is a common clinical problem. Varicosities often starts early in life, but assume a silent course for variable length of time before they develop complications due to venous hypertension.

Sex Distribution

The male sex appears to be more prone to the development of varicosity of lower limb veins than the females. Though the Western study show a clear female predominance (Male: Female = 1:5), the present study showed Male: Female ratio of 2.1:1. It may be because they do not undergo the occupational hazards of that of males like prolonged standing, physical stress involving increased intra-abdominal pressure.

Age Distribution

The varicose veins are more predominant in the age group of 20 - 50 years. So it affects the bread-earning members of the family causing socioeconomic problems. In the present study, about 80% of patients belonged to this age group.

Occupation

Varicose veins are more common in persons, whose occupation force them to stand for prolonged hours. In the present study about 56% of patients had occupations, which involved prolonged standing like farmer, policemen, bus conductor, etc.

Family History

The occurrence of varicose veins in several members of the family suggests the hereditary factors may be an important cause of varicosity. In the present study, 48% of the patients had family history of varicose veins.

Clinical Features

Almost all the patients (100%) had prominent veins as the presenting complaint. Pain was present in about 54% of patients, oedema in 58% of patients, pigmentation and lipodermatosclerosis in 28% of patients and venous ulceration in 12% of patients. Cosmetic appearance was the commonest complaint, which favours with the other comparative studies.

CEAP Classification

Most patients came to the hospital to seek treatment, had one or the other complications of varicose veins (62%); 38% of the patients had only prominent veins which belong to class II.

Limb Involvement

In the present study right limb involvement 38%, left limb involvement 52% was noted. Bilateral limb involvement was seen in 10% of patients. The cause for the increased incidence of left side is not known. This is probably because that the loaded left colon constantly compresses the left iliac veins, the left common iliac artery crossing over the left
common iliac vein and the longer course traversed by the left iliac veins. This compares favourably with the study conducted by A.H.M. Dur, A.J.C. Mackaay et al.¹³

**Venous System Involved**

Long saphenous vein was involved in 98% of patients, the second commonest being perforators which were involved in 86% of patients. Short saphenous veins was involved in about 18% of cases. Majority of the patients has combined saphenofemoral and perforator involvement. Similar results were observed by Al-Mulhim et al.¹⁰

**Site of Incompetence**

Majority of the patients had combined saphenofemoral and perforator incompetence (70%). Isolated perforator insufficiency was noted in only 2% of patients. Combined saphenofemoral, saphenopopliteal and perforator incompetence was seen in 14% of patients.

**Site of Perforator Incompetence**

51.1% of the patients had multiple perforator incompetence. Patients who had multiple perforator incompetence had one or the other complications of varicose veins. Isolated above knee perforator incompetence was seen in only one patient, below knee perforator incompetence was seen in 32.5% of patients and isolated lower leg and ankle perforator incompetence was seen in 13.9% of patients.

**Investigations**

Apart from the routine investigations, all the patients underwent duplex ultrasound of the venous system of lower limbs. This investigation was required to accurately locate the perforator incompetence and to rule out deep venous thrombosis and to mark the site of perforator incompetence before surgery.

**Treatment**

Treatment of cases was dependent upon the individual cases. In patients with venous ulcers Bisgaard’s method of treatment was followed till the ulcer heals and then the patient was subjected to further definitive treatment.

Incompetent saphenofemoral valve is tackled by Trendelenburg operation with flush ligation of saphenofemoral junction and stripping of long saphenous vein. In cases where passing the stripper was difficult due to excessive tortuosity, Multiple Stab Avulsion (MSA) was performed. Saphenopopliteal incompetence was tackled by saphenopopliteal junction ligation. Incompetent perforators were managed either by SFL/EFL or multiple stab avulsion. These procedures were done individually or in combination with other procedures depending on the venous system involved.

In this present study, Saphenofemoral Flush Ligation + Stripping (SFFL + STRP) was performed in 44% of patients, Saphenofemoral Flush Ligation + Stripping + Multiple Stab Avulsion (SFFL + STRP + MSA) was performed in 8% of patients, Saphenofemoral Flush Ligation + Stripping + Subfascial Ligation (SFFL + STRP + SPL) was performed in 28% of patients, Saphenofemoral Flush Ligation + Stripping + Saphenopopliteal Ligation (SFFL + STRP + SPL) was performed in 6% of patients, Saphenofemoral Flush Ligation + Stripping + Saphenopopliteal Ligation + Subfascial Ligation (SFFL + STRP + SPL + SFL) was performed in 10% of patients, Saphenopopliteal Ligation (SPL) alone was performed in 2% of patients, Multiple Stab Avulsion (MSA) alone was performed in 2% of patients.

Skin grafting was done in 2 patients for venous ulcer.

**Complications**

Patients were observed for complications, both intraoperatively and postoperatively. Wound infection was observed in 14% of patients, Haematoma was observed in 8% of patients, Saphenous neuritis was observed in 8% of patients, Wound dehiscence was observed in 6% of patients, 4% of patients had Lymphorrhoea from the inguinal wound. None of our patients had Femoral vein injury, Femoral artery injury, Deep vein thrombosis or Pulmonary embolism.

Sutures were removed at 7 to 10 days. Patients were advised elastic compression stockings for 1 year postoperatively. Patients were followed for 6 months. None of the patients developed recurrence.

**CONCLUSION**

1. Our study shows that the prevalence of varicose veins of lower limbs is more in people of younger age group.
2. Family history of varicose veins of lower limb is an important risk factor in the development of lower limb varicose veins.
3. Occupations involving prolonged standing is an important predisposing factor in the development of lower limb varicose veins.
4. Varicose veins mainly involve the long saphenous system due to saphenofemoral and perforator incompetence.
5. Most of the patients had complications of varicose veins.
6. Duplex ultrasonography is the investigation of choice.

**Summary**

Total number of 50 patients of varicose veins were studied in detail and an analysis data has been presented with following conclusion.

1. Varicosity of the veins of the lower limb is a fairly common clinical entity.
2. In spite of dilated veins for years, majority of the patients (62%) presented only after development of complications; 30% of the patients presented for cosmetic concern.
3. The disease is more prevalent in the age group of 20 - 50 years.
4. The disease is more common in males (2:1 : 1)
5. Occupation involving prolonged standing was a major contributing factor in 56% of patients.
6. Hereditary factors play an important role in the development of varicose veins.
7. Involvement of long saphenous vein is noted in 98% of patients and short saphenous vein in 18% of patients.
8. Perforator incompetence was noted in 86% of patients.
9. Left side is involved more than right side.
10. Primary varicosities are much more common than secondary varicosities.
11. Adequate history and thorough clinical examination of the varicose veins is valuable in diagnosing varicose veins.
12. Duplex ultrasound is the most sensitive and specific investigation required to diagnose varicose veins.
13. Doppler examination of venous system is a reasonable option when duplex ultrasound facility is not available.
14. Surgery is the primary modality of the treatment. Most common surgery performed is saphenofemoral flush ligation with stripping.
15. Bisgaard’s method of treatment is effective against healing of venous ulcers.
16. Complications due to surgery were mainly wound infection, wound dehiscence, haematoma formation, lymphorrhoea and saphenous neuritis.
17. Mortality was nil in this study.
18. None of the patients had recurrence.
19. The procedures followed enable the patient to lead near normal life after the surgery.

REFERENCES