

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 Bisgaard'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.

HOW TO CITE THIS ARTICLE: Janugade HB, Patil BP, Tata NH, et al. Clinical profile and management of lower limb varicose veins. J. Evolution Med. Dent. Sci. 2017;6(20):1615-1622, DOI: 10.14260/Jemds/2017/354

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.

Financial or Other, Competing Interest: None.

Submission 09-01-2017, Peer Review 22-02-2017,

Acceptance 01-03-2017, Published 20-03-2017.

Corresponding Author:

Dr. Bhushan Pralhad Patil,

Flat No. 4, Chintamani Apartments,

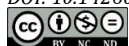
Near Atul Bhosales Bungalow,

Koyna Vasahat, Malkapur,

Karad-415539.

E-mail: dr.bhushanpatil999@gmail.com

DOI: 10.14260/jemds/2017/354



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.
2. Duplex scanning for accurate diagnosis and planning of treatment.
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.

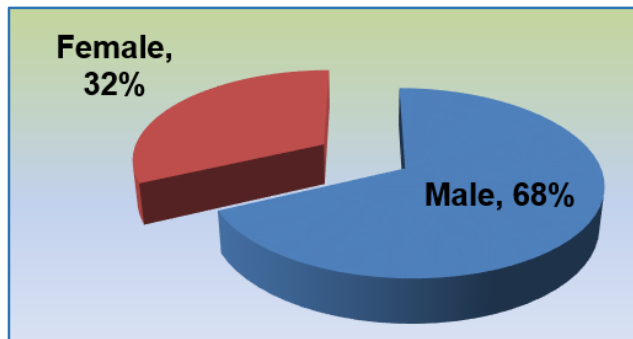
A total of 50 patients (55 number of limbs) with primary varicose veins admitted in surgical ward of Krishna Institute of Medical Sciences, Karad, were studied and following findings were noted and analysed.

Sex Distribution

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

No. of Cases Studied	No. of Cases	Percentage
Males	34	68%
Females	16	32%

Table 1. Sex Distribution



Graph 1. Sex Distribution

Sex	No. of Patients	%	Changes C J et al	AHM Dur, AJC Mackaay et al (%) ³
Male	34	68%	18.12	26.66
Female	16	32%	81.88	73.24

Table 2. Sex Distribution (Comparison)

In the present study, 16 cases were female out of total 50 patients. It is very low compared to the Western studies. These females sought treatment for symptoms due to varicosities rather than cosmetic reason. Most probably Indian women cover their limbs with saree and hence they are not much bothered about the appearance of dilated veins.

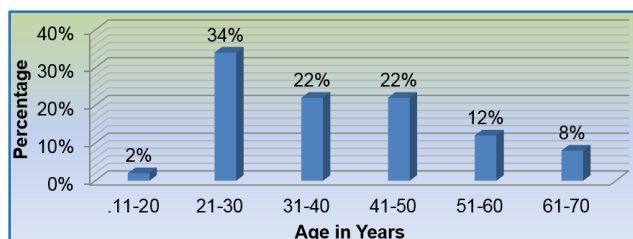
The Age Distribution

The age distribution is characteristically between 20 - 50 years. This group includes 80% of cases. The youngest patient is of the age of 20 years and the oldest at 70 years.

These findings are consistent with the studies of other workers.

Age (Years)	Number of Patients	Percentage
11 - 20	1	02%
21 - 30	17	34%
31 - 40	11	22%
41 - 50	11	22%
51 - 60	6	12%
61 - 70	4	8%

Table 3. Age Distribution



Graph 2. Age distribution

Age (Years)	Lateef (1971) ⁴	Fegan (1972) ⁵	Ratkal (1980) ⁶	Present Series
Below 20	05%	5%	06%	0%
20 - 40	65%	75%	72%	58%
Above 40	30%	20%	22%	42%

Table 4. Age Distribution (Comparison Study)

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.

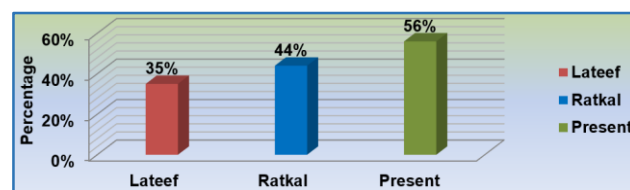
Occupation

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.

Occupation	Lateef (1971) ⁴	Ratkal (1980) ⁶	Present Series
Occupation Involving Prolonged Standing	35%	44%	56% ¹

Table 5. Comparison Study of Occupation versus Varicose Veins

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



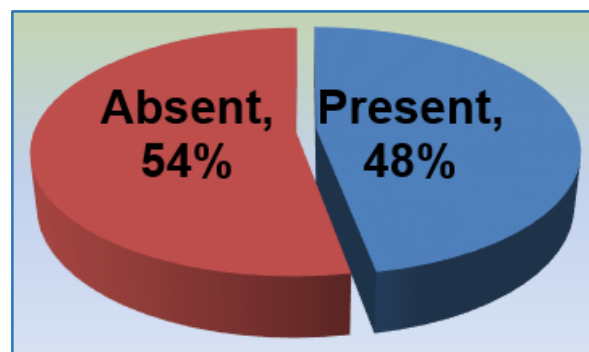
Graph 3. Occupation involving Prolonged Standing

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.

Varicose Vein	No. of Cases	Percentage
Present	24	48%
Absent	27	54%

Table 6. Family History of Varicose Vein

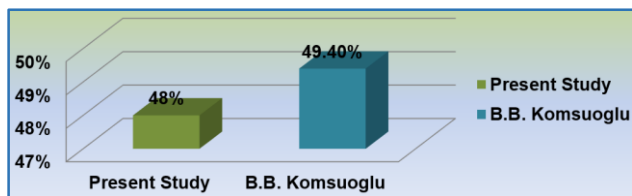


Graph 4. Family History of Varicose Vein

Family History	Present Study	B. B. Komsuoglu-1994 ⁷
Total No. of Patients	50	312
Present	24	154
Percentage	48%	49.4%

Table 7. Family History (Comparative Study)

In this study 48% of patients had positive family history, which is one of the important risk factor in the development of varicose veins.

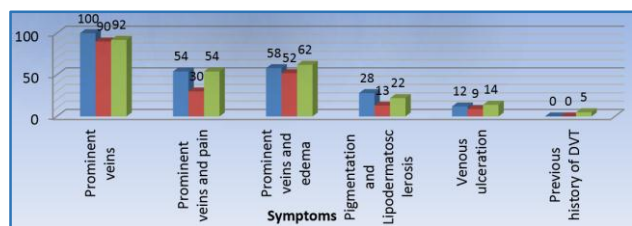


Graph 5. Family History (Comparative Study)

Clinical Manifestations

Symptoms	Present Series		Rudofsky G. Langen Becks Arch Chir (%) ⁸	O'Shaughnessy M et al (%) ⁹
	No. of Patients	% C		
Prominent Veins	50	100.00	90.00	92.00
Prominent Veins and Pain	27	54.00	30.00	54.00
Prominent Veins and Oedema	29	58.00	52.00	62.00
Pigmentation and Lipodermatosclerosis	14	28.00	13.00	22.00
Venous Ulceration	6	12.00	9.00	14.00
Previous History of DVT	0	0	0	5.00

Table 8. Clinical Manifestations



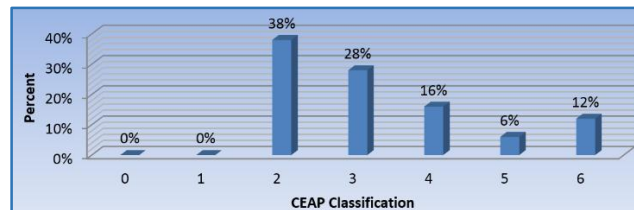
Graph 6. Clinical Manifestations

Almost all patients had prominent varicosities as common symptom associated with other manifestations and complications of varicose veins. Cosmetic appearance was the commonest presenting complaint, which favours with the other comparative studies.

CEAP Classification

Class	Limbs	Percentage
0	0	0%
1	0	0%
2	19	38%
3	14	28%
4	8	16%
5	3	6%
6	6	12%

Table 9. Clinical Class of CEAP



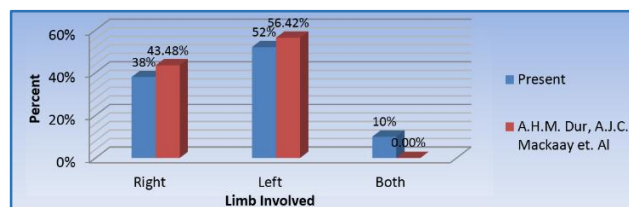
Graph 7. Clinical Class of CEAP

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

Limb Involved	Present Series		A.H.M. Dur, A.J.C. Mackaay et al ³
Right	19	38%	43.48%
Left	26	52%	56.42%
Both	05	10%	0.0%

Table 10. Limb Involvement



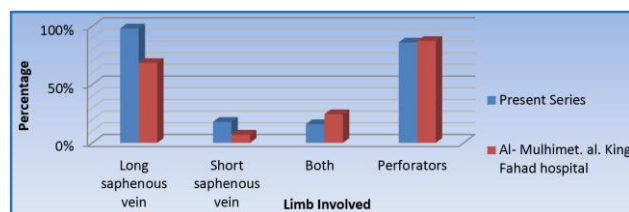
Graph 8. Limb Involvement

In the present study, right limb involvement of 38% and the left limb involvement of 52%, favourably compares with the study conducted by A.H.M. Dur, A.J.C. Mackaay et al. 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. In the present study, bilateral varicose veins were seen in 5 patients (10%).

Venous System Involved

System Involved	Limbs	%	Al-Mulhim et al, King Fahad Hospital (%) ¹⁰
Long Saphenous Vein	49	98%	68.42
Short Saphenous Vein	9	18%	7.02
Both	8	16%	24.56%
Perforators	43	86%	87.29%

Table 11. Venous System Involved

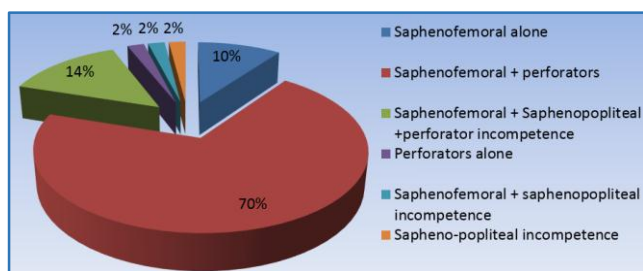


Graph 9. Venous System Involved

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	Number of Patients	Percentage
Saphenofemoral Alone	05	10%
Saphenofemoral + Perforators	35	70%
Saphenofemoral + Saphenopopliteal + Perforator Incompetence	07	14%
Perforators Alone	01	02%
Saphenofemoral + Saphenopopliteal Incompetence	01	02%
Saphenopopliteal Incompetence	01	02%

Table 12. Sites of Incompetence



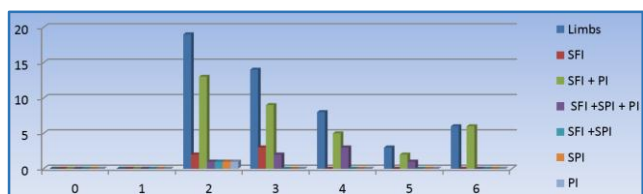
Graph 10. Sites of Incompetence

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.

CEAP Class	Limbs	SFI	SFI + PI	SFI + SPI + PI	SFI + SPI	SPI	PI
0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
2	19	2	13	1	1	1	1
3	14	3	9	2	0	0	0
4	8	0	5	3	0	0	0
5	3	0	2	1	0	0	0
6	6	0	6	0	0	0	0

Table 13. Correlation between CEAP Class and Site of Incompetence

The patients with higher grade of clinical CEAP classification had combined valvular incompetence. All the patients with ulcers had perforator incompetence.

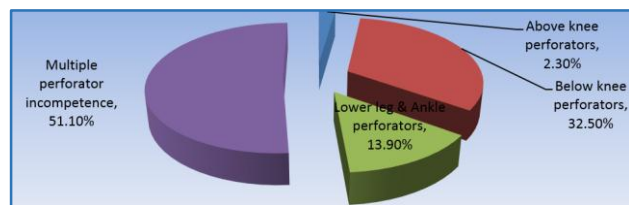


Graph 11. Correlation between CEAP Class and Sites of Incompetence

Sites of Perforator Incompetence

Sites of Perforator	No. of Patients	Percentage
Above Knee Perforators	01	02.3%
Below Knee Perforators	14	32.5%
Lower Leg and Ankle Perforators	06	13.9%
Multiple Perforator Incompetence	22	51.1%

Table 14. Sites of Perforator Incompetence



Graph 12. Sites of Perforator Incompetence

Duplex Ultrasound

Findings	Clinical Examination	Duplex USG
Saphenofemoral Incompetence	48	48
Saphenopopliteal Incompetence	9	9
Perforator Incompetence		
Above Knee Perforators	00	01
Below Knee Perforators	13	14
Lower Leg Perforators	06	06
Multiple Perforators	20	22
Deep Venous Thrombosis	0	0

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



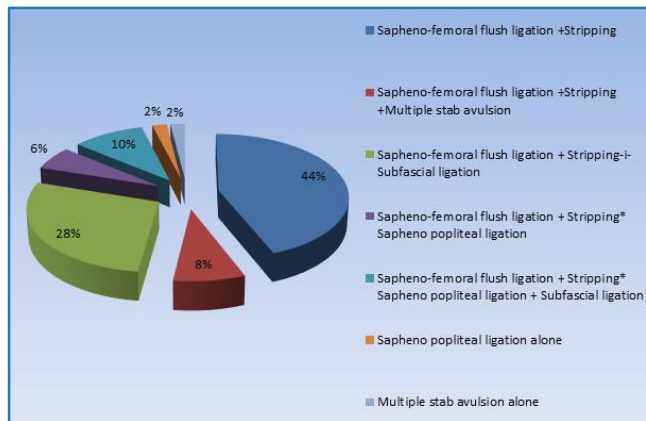
Graph 13. Clinical Examination v/s Duplex Ultrasound Site of Incompetence

Duplex ultrasound was required to accurately diagnose perforator incompetence in 4 patients.

Surgical Procedures

Surgical Procedures	Limb	Percentage
Saphenofemoral Flush Ligation + Stripping	22	44%
Saphenofemoral Flush Ligation + Stripping + Multiple Stab Avulsion	04	08%
Saphenofemoral Flush Ligation + Stripping + Subfascial Ligation	14	28%
Saphenofemoral Flush Ligation + Stripping* + Saphenopopliteal Ligation	03	06%
Saphenofemoral Flush Ligation + Stripping* + Saphenopopliteal Ligation + Subfascial Ligation	05	10%
Saphenopopliteal Ligation Alone	01	02%
Multiple Stab Avulsion Alone	01	02%

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

Procedures	Present Study	S.K. Sahu, S Bhushan, P.K. Sacha, 2012 ¹¹
Trendelenburg Operation + Stripping	44%	42.85%

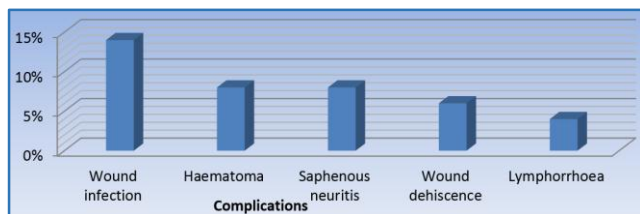
Table 17. Comparative Study of Treatment of Varicose Veins

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

Complications

Complications	Number of Patients	Percentage
Wound Infection	07	14%
Haematoma	04	08%
Saphenous Neuritis	04	08%
Wound Dehiscence	03	06%
Lymphorrhoea	02	04%
Femoral Vein Injury	0	0
Femoral Artery Injury	0	0
Deep Vein Thrombosis	0	0
Pulmonary Embolism	0	0

Table 18. Complications of Surgery



Graph 15. Complications

Complications	Percentage
Femoral Vein Injury	1
Femoral Artery Injury	0.02
Deep Vein Thrombosis	0.15
Pulmonary Embolism	0.06

Table 19. Hagmuller G.W. and Langenbecks Arch Chis Study¹²

In the present study, some minor complications occurred which were managed conservatively. The study conducted by Hagmuller 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),^{13,14} 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.^{15,4}

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.⁹

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.³

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 were 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 + SFL) 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; 38% 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

- [1] Lam EY, Giswold ME, Moneta GL. Venous and lymphatic disease. 8th edn. Chapter 23, Schwartz's principles of surgery 2005:808-33.
- [2] Salaman RA, Salaman JH. Improving the preoperative assessment of varicose veins. *Br J Surg* 1997;84(12):1748.
- [3] Dur AHM, Mackaay AJC. Duplex assessment of clinically diagnosed venous insufficiency. *Br J surg* 1992;79:155-61.
- [4] Lagattolla NRF, Burnand KG, Sarin S. Duplex ultrasonography for assessment of venous valvular function of the lower limb. *Br j Surg* 1995;82(6):855-6.
- [5] Fegan WG, Klime AL. The cause of varicosity in superficial veins of lower limb. *Br j Surg* 1972;59(10):798-801.
- [6] Ratkal C. Thesis on clinical pathological study of varicose veins of the lower limb. University of Mysore 1980.
- [7] Komsuoğlu B, Gödeli O, Kulan K, et al. Prevalence and risk factors of varicose veins in an elderly population. *Gerontology* 1994;40(1):25-31.
- [8] Rudofsky G. Epidemiology and pathophysiology of primary varicose veins. *Langenbecks Arc Chir* 1988;(Suppl 2):139-44.
- [9] O'Shaughnessy M, Rahall E, Walsh TN, et al. Surgery in the treatment of varicose veins. *Ir Med J* 1989;82(2):54-5.
- [10] Al-Mulhim AS, El-Hoseiny H, Al-Mulhim FM, et al. Surgical correction of main stem reflux in the superficial venous system: does it improve the blood flow of incompetent perforating veins? *World J surg* 2003;27(1):793-6.
- [11] Sahu S, Bhushan S, Sachan P. Clinico-Anatomical and radiological study of varicose veins of lower limb and their management outcomes. *The Internet Journal of Surgery* 2012;28(2)1-9.
- [12] Hagmuller GW. Complications in surgery of varicose veins. *Langenbecks Arch Chir Suppl Kongressbd* 1992:470-4.
- [13] Teruya TH, Ballard JL. New approaches for the treatment of varicose veins. *Surg Clin N Am* 2004;84(5):1397-417.
- [14] Chang CJ, Chua JJ. Endovenous laser photocoagulation (EVLP) for varicose veins. *Lasers surg Med* 2002;31(4):257-62.
- [15] Gillespie D. Superficial varicose veins: Therapeutic options. In: *Surgical management of venous diseases*. 1st edn. Williams and Wilkins, a waverly company 1997;25:373-90.