

## Physiological Changes in the Venous System of Lower Extremities in a Case of Varicose Vein

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**Abstract:** Varicose vein is a common clinical entity, with their symptoms and the most common complication like chronic peripheral vascular disorders. In this study, a 45 yrs old male, presented with a complaints of ulcer in the lateral aspect of the right lower limb over the ankle for 20 days. The patient had a previous history in his left leg, got treated with saphenofemoral junction ligation surgery. For the present complaints he was treated by Trendelenburg procedure. He was followed for a minimum of 3 months after discharge. Varicose veins were recognized in the present century and considerable knowledge has been gained about the anatomy of venous system of the leg, the physiological mechanism of venous return to heart against gravity and pathology of the disorder, which leads to many newer modalities of treatment.

**Keywords:** Varicose Vein, Venous Leg Ulcer, Doppler, Management and Follow up

### INTRODUCTION

Varicose veins are dilated, tortuous, widened or elongated veins in the subcutaneous tissues of the legs and are often easily visible. Their valves are usually incompetent so that reflux of blood occurs, and also causes certain complications like chronic vascular disorders and leading to surgical treatments. In addition, normal superficial veins in a lean person may appear large, whereas varicose veins in an obese person may be hidden. Prevalence of varicose veins is 35%; severe condition is 10%; chronic venous insufficiency (CVI) is 8%; ulcer 2% [2].

The prevalence has been variously reported from as little as 2% to over 20% in population studies [1]. This variation results from different populations study, different definitions were applied and the assessment or examination techniques were used. Western studies have shown that 20% population suffers from varicose vein and 2% have skin changes proceeding to venous ulceration [1]. This case report is one among the 2% of varicose vein with ulcer on the lateral aspect of the lower limb.

### CASE REPORT

A 45 years old male, tea master by occupation, presented with a complaints of ulcer in the lateral aspect of the right lower limb over the ankle for 20 days. He was apparently normal before two months, initially the patient had swelling of the right lower limb, progressively increasing in size, aggravated on standing, relieved by rest and in lying down position, it was associated with pain. There was a history of serous discharge, cramping pain, night cramps, prolonged standing and no history of trauma, fever, bleeding, constipation and no abdominal swelling. The patient had a previous history of varicose vein of left lower limbs, got treated with saphenofemoral junction ligation

surgery 4 years back. He is a known case of seizure disorder was under treatment with sodium valproate and phenytoin twice a day, clobazam once a day for the past 30 years. There is no other history of diabetes, hypertension, asthma and no family history. On General examination, the patient is conscious, well oriented to time, place and person, comfortable. He is pale and pitting pedal edema present, Inguinal lymph node enlargement present, no icterus, cyanosis, clubbing.

On systemic examination there is no abnormalities in Cardiovascular system, respiratory System, per abdomen examination is soft, no organomegaly and there is no focal neurological deficit.

### Examination of right lower limb

#### INSPECTION

Dilated veins seen from the medial malleolus to the medial side of the knee, extending upto the medial side of upper thigh. Single Ulcer noted on medial aspect of the lower part of leg, near the medial malleolus, 3\*4cm, vertically oval in shape, sloping edges, scanty serous discharge, surrounding skin is

eczematous. No impulse on coughing at the saphenous opening.

#### PALPATION

- Trendelenberg test positive (incompetent sapheno-femoral valve)
- Tourniquet test showed incompetent mid thigh, lower thigh and lower leg perforators.
- Modified Perthe's test showed normal deep veins
- Schwartz test, Moses sign, Homen sign- negative
- Morrissey's cough impulse test-negative
- By feegan's method-perforator palpable in the ankle and calf.
- Inguinal lymph nodes palpable, multiple.2\*3.

Examination of left lower limb is normal.

The routine blood investigation reports are haemoglobin - 11.3g/dl, Total leucocyte count-8300cells/mm<sup>3</sup>, Erythrocyte Sedimentation Rate - 10/22mmhr. Urine routine - no albumin, no sugar, pus cells 2-3 is present, epithelial cells are around 3 to 4 and rbc is nil. His random blood sugar level is 89mg/dl. Urea is 26mg/dl and Creatinine is 0.8mg/dl.

- **Venous Doppler of right lower limb:** Normal study of deep venous system, varicosity in right greater saphenous system with incompetent perforators.
- Multiple inguinal lymph nodes were present.
- The digital EEG was within normal limits.

The treatment planned for this case is Trendelenburg procedure, before the surgery the preoperative preparation is done. Since the patient is a known case of seizure disorder, neurologist is consulted and patient is put on IV fosphenytoin for two days prior and on the day of surgery, as per is opinion.

#### Intra- operative photographs (a&b) of trendelenburg procedure



Fig-1: In the Beginning of the surgery



Fig-2: On suturing at first incision

#### POST – OPERATIVELY

On the third day, the patient developed fluid collection around the first surgical site, which was treated conservatively along with the removal of sutures and wick drain, and antibiotics according to pus c/s -Escherichia Coli bacteria -Sensitive to antibiotic Gentamicin.

#### DISCUSSION

Veins are thin-walled vessels with collapsible walls that are assumed as an elliptical configuration in collapsed state and circular configuration in the filled state. Varicosity of the lower limb is a fairly common clinical entity because of the erect posture and long column of blood has to be supported which can lead to weakness and valvular incompetence. This varicose vein disease is mostly seen in long standing the involvement of long saphenous system is more common [3], which has more than 10 valves than the short saphenous system has usually one valve. The right limb is affected more common. The patients came with all the common symptoms related to varicose vein. The main cause for night cramps due to increase venous wall tension leading to chronic venous hypertension [5]. Emphasized that elevation of the limbs when sitting and avoidance of standing for prolonged periods may assist in reducing edema [4]. Normally, the arterial blood flows into the leg, distal superficial veins constantly fill. Venous Blood is regularly emptied from the superficial system into the deep venous system via the SFJ, SPJ and perforators [5]. This blood is then returned to the right side of the heart through one-way valves by calf muscle contraction, the pressure increases. During relaxation phase of walking, pressure in the calf falls and it allow the blood to flow from superficial to deep veins through

perforators. And while walking, foot pump mechanism propels blood from the plantar vein to legs [2].

If the calf muscle pump is not working or there is damage to the perforating veins, this unusual backward flow of blood can cause venous hypertension in the lower leg. One of the study [4] reveals, in the absence of a blood clot, there is most likely a structural abnormality of the vein wall or valve, allowing backflow of blood and increase in pressure within the vessel. Valves prevent backflow of blood, may become damaged, resulting in pooling of blood within the veins.

These are the changes occurring in the normal physiological venous system due to varicose vein commonly in the lower extremities. This is mainly seen in prolong standing (ex: traffic man), immobility, pregnant women's, raised intra- abdominal pressure conditions.

Doppler is a valuable supplement to clinical examination for effective treatment of varicose veins and its use is strongly recommended, as it is effective tool in detecting the venous incompetence. The patient had a surgery. The Sutures of second and third incision was removed at 11<sup>th</sup> post operative day. The patient did not develop any varicosities. He was discharged at 15<sup>th</sup> day.

He was followed up for a minimum of 3 months after discharge for recurrence of varicosity, healing of ulcers, Deep Vein Thrombosis signs, and work rehabilitation.

## CONCLUSION

Study of [6] reveals that the disease is more prevalent during the active adult life in their 3rd and 4th decades and males were more affected. Definite relationship exists between the occupation and the incidence of varicose veins. The patient occupation requires longer period of standing had the higher chances of varicose vein. Continuous sitting and prolong standing causes pooling of blood in the legs leading to varicosities. The risk factors are lack of leg exercise, unaware of healthy diet, increased age, increase BMI, pregnancy, prolonged standing, and a sedentary lifestyle.

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