



Clinical Evaluation of Venous Leg Ulcers, And Their Underlying Pathology In Correlation With Various Complications

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Abstract

Introduction: Venous leg ulcers are extremely common. They affect between 500,000 and 2 million people annually and are responsible for over 50 percent of all lower extremity ulcers.¹ Elevated venous pressure, turbulent flow, and inadequate venous return are the common causes of venous leg ulcers. Risk factors for chronic venous disease include underlying conditions associated with the poor venous return (such as congestive heart failure and obesity) and primary destruction of the venous system (such as prior deep venous thrombosis, recreational injected drug use, phlebitis, and venous valvular dysfunction). Clinicians diagnose venous ulcers based on anatomic location, morphology, and characteristic skin changes. Clinicians confirm this diagnosis by assessing the functionality of the venous system, most commonly by venous duplex ultrasound.

Aim & Objective: To analyze the incidence of venous leg ulcers in different age groups and sex, to know the relationship between socio-economic status and venous ulcers, to compare the duration of ulcer and symptoms, to analyze underlying pathology, the side of ulcer, to evaluate the causes, the recurrences and complications and finally to find out the best-suited procedure.

Methods: This is an observational study; Among 116 patients who had venous ulcerations 111 were due to varicose veins and 5 patients had DVT. Period of May 2021 to October 2021. At Government Nagapattinam Medical college & Hospital, Nagapattinam in the Department of General Surgery. Routine investigations of blood and urine were done. Swab taken from the wound and antibiotics prescribed according to culture and sensitivity. Patients were treated with initial Hydrogen Peroxide and Povidone Iodide until the wound became healthy and then normal saline dressing was done daily. Elastocrepe bandage was applied from the level of the head of the metatarsal up to the knee. The limb was kept elevated by raising the foot end of the bed. 110 patients underwent surgery. The choice of surgery was determined by the extent of the disease and the patient's general condition. The procedures done included Trendelenburg operation, a complete stripping of long saphenous vein, multiple avulsions, sub-fascial ligation, and extra-fascial ligation of perforators.

Results: In my study, the majority of patients with Venous Leg Ulcers were in the age group of 20-40 years, which constituted 57%. The youngest patient was 20 years old and the oldest was 65 years old. Staph aureus was a common organism presented in 37% of ulcers. No growth was found in 22% of patients. Gram -ve organisms were found in 29% of cases. Among 116 patients admitted with venous ulcers, five patients had DVT five had bilateral disease (Varicose Vein). The combined small and long saphenous disease was found in 5 patients. Among 116 patients 110 limbs were operated on. 103 patients underwent long saphenous ligation and or stripping. Cockett's extra fascial ligation was done in 8 cases. Multiple avulsions were done in 19 cases. Short saphenous vein ligation was done in 8 patients.

Conclusion: Leg ulceration is common in poor people below the poverty line. (Perhaps we can not compare with the available data alone because much middle class and most high-class people never come to Govt. Hospital). This may also be related to their nutritional status. The common associations of ulcers are hyperpigmentation followed by pruritis and pain, especially on prolonged standing which is relieved by keeping legs elevated. Pain is most often felt at the ulcer site and sometimes also felt involving the entire leg. Left-sided venous ulcers are more common than (R) side ulcers. This may be due to loaded sigmoid colon compressing veins draining the (L) lower limb.

Keywords: Cockett's extra fascial ligation, Short saphenous vein, DVT, microorganism

Introduction

Venous ulceration” is defined as ulceration of the malleolar skin in the presence of perforating vein incompetence with or without deep vein incompetence. Ulceration of the lower leg is a common symptom that will affect 2

% of people in their lifetime.[1] Its prevalence increases with age from 0.5% among patients over 40 to 2 % among those who are 80. As the proportion of elderly people in the population increases, we can expect a rise in the present estimated number of leg ulcers unless a more educated approach to its management is taken. Leg ulcers are debilitating and greatly reduce patients' quality of life. The common causes are venous disease, arterial disease, and neuropathy.[2] Less common causes are metabolic disorders, hematological disorders, and infective diseases. As many factors lead to chronic lower leg ulceration, an interdisciplinary approach to the systematic assessment of the patient is required, to ascertain the pathogenesis, definitive diagnosis, and optimal treatment. A correct diagnosis is essential to avoid inappropriate treatment that may cause deterioration of the wound, delay wound healing, or harm the patient.[3] Though important advances have been made in the management of leg ulcers, India lags far behind the standards set by the European countries. Treatment is fragmented, poorly taught, and inadequately researched. The average time taken to heal an ulcer is about 6 months and some persist for years. Good management depends on accurate diagnosis, simple and appropriate care of the wound, and treatment of the underlying cause. We used the standard definition of a chronic venous leg ulcer, which is the presence of an active ulcer for 6 weeks or more with evidence of earlier stages of venous disease such as varicose veins, edema, pigmentation,

and venous eczema. We included studies of patients with or without another major comorbidity.[4,5]

Methods

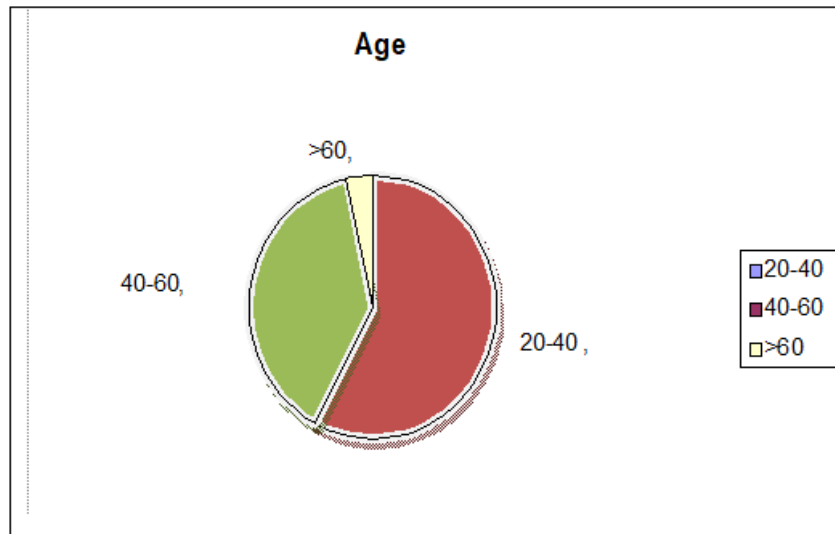
This is an observational study; Among 116 patients who had venous ulcerations 111 were due to varicose veins and 5 patients had DVT. Period of May 2021 to October 2021. At Government Nagapattinam Medical college & Hospital, Nagapattinam in the Department of General Surgery A detailed history including symptoms, duration of ulcer, mode of development, occupation, previous surgery, claudication were taken. The patients were examined in both standing and recumbent postures. The location, size, floor of the ulcer, and secondary changes in the leg including pigmentation, periostitis of the underlying bone, mobility of ankle joint were noted. Regional lymph nodes were examined. Legs were examined individually for varicosities. Saphenofemoral / Saphenopopliteal and perforator incompetences were made out by Trendelenburg, multiple tourniquet test, and Schwartz test. Deep vein assessed by Perth's test. Perforator incompetences were localized by palpating the deep fascia for defects. Arterial pulses of both feet were examined to rule out arterial components. Abdominal and pelvic examinations were done to rule out tumors, dilated suprapubic veins, and ascites. Doppler and Duplex imaging was used to rule out DVT and localize perforator incompetence in all cases. Routine investigations of blood and urine were done. Swab taken from the wound and antibiotics prescribed according to culture and sensitivity. Patients were treated with initial Hydrogen Peroxide and Povidone Iodide until the wound became healthy and then normal saline dressing was done daily. Elastocrepe bandage was applied from the level of the head of the

metatarsal up to the knee. The limb was kept elevated by raising the foot end of the bed. 110 patients underwent surgery. The choice of surgery was determined by the extent of the disease and the patient's general condition. The procedures done included Trendelenburg operation, a complete stripping of long saphenous vein, multiple avulsion, sub-fascial ligation, and extra-fascial ligation of

perforators. After performing the surgery a layer of pad and cotton bandage was applied, over which the last crepe bandage was also applied. The dressings were changed on the 3rd POD. The patient was allowed to walk after 12 hours. The sutures were removed after 10 days. They were advised to avoid prolonged standing and to wear the last crepe bandage for 6 months

Results

Graph :1 Age Incidence



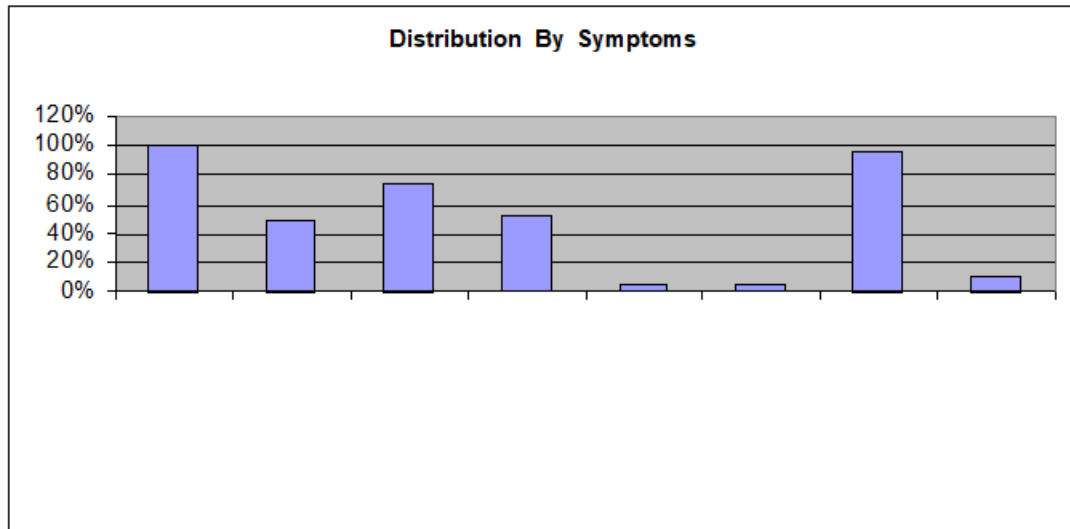
Graph :1 In my study the majority of patients with Venous Leg Ulcers were in the age group of 20-40 years, which constituted 57%. The youngest patient was 20 years old and the oldest was 65 years old. Mainly Males were affected. Most of the patients were laborers who work in standing posture most of the time.

Table :1 Incidence Of Laterality

SIDE	No. Of Patients	Percentage
Left	65	56%
Right	46	40%
Bilateral	5	4%

Table :1 Left side ulcers were more common than the right side. Amonginpatients, bilateral disease (Ulcer) was present in only 5 patients.

GRAPH:2 SYMPTOMS



Ulcers were multiple(≥ 2) in 5 patients. 48% of patients complained of itching (so also pain). A history of bleeding was present in only one patient with varicose ulcers. Urine. All diabetic patients are excluded from the study. Only in 18 patients did urine examination reveal a trace of albumin in the urine. Haemogram – Only one patient showed Hb of 8gms % who was unfit for surgery. All others showed a Hb of >10 gms%. No abnormal rises of ESR were noticed in any of the patients.

Table:2 Wound Swab For Culture & Sensitivity

Organism Grown	No. Of Patients	Percentage
Staph. aureus	43	37%
Klebsiella	13	11%
E.Coli	17	15%
Pseudomonas	8	7%
Mixed	8	7%
No Growth	27	22%

Table:2 These results were comparable to British reports. Staph aureus was a common organism presented in 37% of ulcers. No growth was found in 22% of patients. Gram –ve organisms were found in 29% of cases.

Table :3 Results Of Examination Of 116 Limbs

Defect	No.	Percentage
1. Long Saphenous Varicosity	103	89 %
2. Saphenofemoral incompetence	92	79%

Perforator incompetence Medial ankle	100	86%
Lateral ankle Calf	92	79%
Below knee	3	3%
Mid-thigh	6	7%
4. Small saphenous varicosity with SPI	8	3%
5. Combined small & long saphenous varicosity	5	3%
6. Bilateral disease	5	7%
7. DVT (Perth's Sign +)	5	2%

Table :3 Among 116 patients admitted with venous ulcers five patients had DVT five had bilateral disease (Varicose Vein). The combined small and long saphenous disease was found in 5 patients.

Table:4 Details Of Surgery Done

Surgery is done (on 110 limbs)	No. of Limbs	Percentage
Long Saphenous Ligation and or stripping	103	89%
Short Saphenous Vein Ligation	9	8%
Multiple Avulsion	19	16%
Cockett's Procedure	9	8%
Conservative Treatment	11	10%

Table:4 Among 116 patients 110 limbs were operated on. 103 patients underwent long saphenous ligation and or stripping. Cockett's extra fascial ligation was done in 8 cases. Multiple avulsion was done in 19 cases. Short saphenous vein ligation was done in 8 patients.

Table:5 Complications Of Surgery

Complication	No.	Percentage
1. Wound Infection	17	15%
2. Wound Haematoma	4	4%
3. Wound gaping	9	8%
4. Anaesthesia related (Headache)	24	20%

Discussion

The association between ulceration at the ankle and venous disorders of the lower limbs has been known for more than 2000 years. Venous circulation of the lower extremities progresses from the superficial to

perforating to deep veins, with valves in each system to ensure unidirectional blood flow. As the calf muscles contract, the pumping action causes the blood to flow from the deep veins into the inferior vena cava. The disease of these pathways results in venous insufficiency. [6] Venous insufficiency is the

most common cause of lower-leg ulcers, accounting for nearly 80% of all cases. Of the approximately 7 million people in the United States with venous insufficiency, approximately 1 million develop venous leg ulcers [7]. Approximately 1% of the population will suffer from leg ulceration at some point in their lives. Chronic venous leg ulceration has an estimated prevalence of between 0.1% and 0.3% in the United Kingdom. Prevalence increases with age. Venous ulcers are more common in women and older persons. The primary risk factors are older age, obesity, previous leg injuries, deep venous thrombosis, and phlebitis. Venous ulcers are often recurrent, and open ulcers can persist from weeks to many years. Severe complications include cellulitis, osteomyelitis, and malignant change.[8] It has been reported that ulcers related to venous insufficiency constitute 70%, arterial disease 10%, and ulcers of mixed etiology 15% of leg ulcer presentations. The remaining 5% of leg ulcers result from less common pathophysiological causes, and this latter group comprises considerable challenges in diagnosis, assessment, and management.[9]In the Western world, leg ulcers are mainly caused by venous insufficiency, arterial insufficiency, neuropathy, diabetes, or a combination of these factors. Venous ulcers are the most common type of leg ulcers, accounting for approximately 70% of cases. The arterial disease accounts for another 5% to 10% of leg ulcers; most of the others are due to either neuropathy (usually diabetic) or a combination of those diseases. [10]The study from India shows that the etiology of chronic wounds included systemic conditions such as diabetes, atherosclerosis, tuberculosis, and leprosy. Other major causes included venous ulcers, pressure ulcers, vasculitis, and trauma. The study report stated that inappropriate treatment of acute traumatic wounds was the most common cause of the chronic wound. [11]Chinese study shows that the principal etiology (67%) of ulceration is trauma or traumatic wounds compounded by an infection. Diabetic ulcers, venous ulcers, and pressure ulcers accounted for 4.9%, 6.5%, and 9.2%, respectively. The majority of these wounds were seen in farmers and other agricultural workers. it is useful to divide leg ulcers into those occurring in the gaiter area and those occurring in the forefoot because the aetiologies in these two sites are different. At least two aetiological factors can be

identified in one-third of all lower limb ulcers.[12] Venous ulcers most commonly occur above the medial or lateral malleoli. Arterial ulcers often affect the toes or shin or occur over pressure points. Neuropathic ulcers tend to occur on the sole or over pressure points. Patients with reduced mobility or obesity may develop ulceration in the gaiter area because of venous hypertension resulting from inadequate functioning of the calf muscle pump.[13] The commonest causes of vasculitis ulcers are rheumatoid arthritis, systemic lupus, and polyarteritis nodosa. The blood dyscrasias that most commonly lead to leg ulceration are sickle-cell disease, thalassemia, thrombocythaemia, and polycythemia rubra vera. Other hematological disorders associated with the development of leg ulcers include leukemia, hereditary spherocytosis, thrombotic thrombocytopenic purpura, granulocytopenia, and polyclonal dysproteinaemia.[14] Leg ulcers related to hematological disorders generally result from microcirculatory occlusion. Microcirculatory and vascular disorders that can result in atypical leg ulceration include Raynaud's phenomenon, Martorell's ulcers, and cutaneous vasculitis. Numerous disorders can result in neuropathy of the lower legs and associated ulceration due to insensate injury, burns, or pressure ulcers, for example, leprosy, alcoholic neuropathy, and tabes dorsalis.[15]According to a recent report, chronic kidney disease (CKD), hypertension, and myocardial ischemia may also be associated with an increased risk of developing foot ulcers including severe ulcers that necessitate amputation. Additionally, there are reports of higher rates of malnutrition and deficiencies of vitamins and minerals such as zinc in patients with chronic venous leg ulcers compared to the general population [16]

Conclusion

.The common associations of ulcers are hyperpigmentation followed by pruritis and pain, especially on prolonged standing which is relieved by keeping legs elevated. Pain is most often felt at the ulcer site and sometimes also felt involving the entire leg. Left-sided venous ulcers are more common than (R) side ulcers. This may be due to loaded sigmoid colon compressing veins draining the(L) lower limb. Wound hematoma though described as a common postoperative complication, is rare where absolute meticulous hemostasis is achieved during surgery.

Failure to ligate the incompetent medial ankle perforator is the most common cause of the recurrent venous ulcer. At the same time even when all the perforators are ligated meticulously, the ulcer recurs after some time. The arterial component contributing towards venous ulcers was excluded by clinical palpation of pedal pulses. In a few cases, the difficulty encountered in palpating was overcome with the help of Doppler. Stripping of the great saphenous vein was performed up to just above the ankle in almost all cases. This stripping should be limited to the upper calf since the distal to this Part's most long saphenous vein is normal in diameter and can be used for Bypass Surgeries.

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