

A Clinico-Etiopathological Study Of Leg Ulcers At Tertiary Care Center

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Abstract: Background: A leg ulcer is a disruption in the epithelial integrity of the skin, typically located between the knee and malleoli, characterized by partial or complete loss of the epidermis and dermis, occasionally extending into the subcutaneous adipose tissue. The incidence of leg ulceration is increasing, due to risk factors such as advancing age and increasing prevalence of risk factors like smoking, obesity, hypertension, and diabetes mellitus. Without timely intervention, these ulcers may recur and precipitate severe complications, imposing substantial economic burdens on patients. Material And Methods: In this observational study, 32 patients with leg ulcer attending the dermatology OPD at P.D.U. medical college, Rajkot, Gujarat were enrolled after obtaining their consent. Detailed history of each patient was recorded. Routine investigations and biopsy were done to detect associated risk factors and histopathological correlation. Result: Among the 32 patients, 21 (65.62%) were male and 11 (34.38%) were female, predominantly in the age group of >50 years, trophic ulcers (31.25%) was predominant followed by pyoderma gangrenosum (25%), venous ulcers (18.75%), vasculitic ulcers (15.62%), diabetic ulcers (6.25%), and malignancy-related ulcers (3.12%). History of sensory neuropathy due to leprosy (33.33%), obesity (21.88%), hypertension (18.75%), diabetes (18.75%), and malignancy (3.12%) were the common risk factors in leg ulcer patients. Conclusion: Due to the complex nature of these ulcers, a thorough diagnostic approach and adherence to treatment plans are essential for successful management. [Kyada N Natl J Integr Res Med, 2024; 15(1): 36-41, Published on Dated: 26/01/2024]

Key Words: Leg Ulcers, Trophic Ulcer, Venous Ulcer, Pyoderma Gangrenosum

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Introduction: A leg ulcer is characterized by a breach in the epithelial integrity of the skin, typically located between the knee and the malleoli. These wounds may involve the complete loss of the epidermis or portions of the dermis, occasionally extending into the subcutaneous fat layer¹.

The incidence of ulceration is on the rise due to factors such as the aging population and increased prevalence of risk factors like smoking, obesity, hypertension, and diabetes, which contribute to atherosclerotic occlusion.

Leg ulcers are frequently associated with infection, malignancy, adverse drug reactions, trauma, and hematological disorders. This problem affects adults, who are in their prime working age².

Lower extremity ulcers are common and challenging problem for patient and clinician who provide their care.

It also affects patient's quality of life, financial, social and psychological domain. Leg ulcers are

common and frequently necessitate dermatological consultation. Left untreated, these ulcers can recur and lead to serious complications, posing significant economic burdens on patients.

A precise diagnosis is crucial to prevent inappropriate treatment, which could delay wound healing or exacerbate the condition.

However, there is a lack of data regarding the prevalence and natural progression of lower extremity wounds among Indian patients¹.

Materials and Methods: This cross sectional observational study was conducted in the Department of Dermatology at P.D.U. government Medical College and Hospital, Rajkot a tertiary care centre in Gujarat.

Approval for the study was obtained from the institutional ethics committee, and written consent in the local language was obtained from all participants.

A total of 32 patients were included in this study.

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Table 1:

<ul style="list-style-type: none"> • <u>Vascular Diseases</u> a) <u>Venous</u> • Varicose Vein B) <u>Arterial</u> • Atherosclerosis • Thromboangitis Obliterans • Arteriovenous Malformation • Cholesterol Embolism C) <u>Lymphatics</u> • Lymphedema 	<ul style="list-style-type: none"> • <u>Infectious</u> a) <u>Bacterial</u> • Furuncle • Ecthyma • Mycobacterial Infection • Septic Emboli b) <u>Fungal</u> • Majocchi's Granuloma • Deep Fungal Infection c) <u>Protozoal</u> • Leishmaniasis
<ul style="list-style-type: none"> • <u>Inflammatory</u> a) <u>Vasculitis</u> 1) <u>Small Vessel Vasculitis</u> • Rheumatoid Arthritis • Lupus Erythematosus • Sjogren Syndrome 2) <u>Medium And Large Vessel Vasculitis</u> • Polyarteritis Nodosa • Wegener's Granulomatosis b) <u>Pyoderma Gangrenosum</u> c) <u>Necrobiosis Lipoidica</u> d) <u>Panniculitis</u> 	<ul style="list-style-type: none"> • <u>Hematological Diseases</u> a) <u>Red Blood Cell Disorders</u> • Sickle Cell Anemia • Hereditary Spherocytosis • Polycythemia Rubra Vera b) <u>White Blood Cell Disorder</u> • Leukemia C) <u>Dysproteinemia</u> • Cryoglobulinemia • Cold Agglutinin Disease • Macroglobulinemia
<ul style="list-style-type: none"> • <u>Neuropathic</u> • Diabetes • Leprosy • Tabes Dorsalis • Syringomyelia 	<ul style="list-style-type: none"> • <u>Neoplastic</u> • Squamous Cell Carcinoma • Basal Cell Carcinoma • Cutaneous T Cell Lymphoma
<ul style="list-style-type: none"> • <u>Physical</u> • Burns-Thermal, Electrical, Chemical • Cold Injury (Frostbite) • Radiation 	<ul style="list-style-type: none"> • <u>Metabolic</u> • Diabetes • Gout • Calcinosis Cutis

A detailed patient history was meticulously documented, encompassing age, gender, primary complaints, medication regimen, and duration of lesions, using a predefined form. Clinical data, including number of ulcers, morphology, location, presence of varicose veins, hypo-pigmented patches, edema, sensory deficits, oozing, and bleeding, were systematically noted for each individual.

Standard laboratory investigations, such as complete blood count, fasting blood sugar, liver and kidney function tests, were conducted for all patients. Additional assessments, such as the Biopsy, Mantoux test, antinuclear antibody test, Rheumatoid factor assay, and Doppler studies, were performed as indicated. Detailed records of disease progression, duration, and any concurrent systemic conditions were maintained. Hospitalized patients received comprehensive

supportive care initially, followed by tailored treatment targeting the specific dermatological conditions identified.

Result: In our study, the majority of patients fell within the age group of 51 to 60 years (37.5%). Out of the total 32 patients, 21 (65.62%) were male and 11 (34.38%) were female, resulting in a male-to-female ratio of 1.9:1. A significant portion, 60%, hailed from rural areas.

Regarding etiological distribution, trophic ulcers due to leprosy were predominant (31.25%), followed by pyoderma gangrenosum (25%), venous ulcers (18.75%), vasculitic ulcers (15.62%), diabetic ulcers (6.25%), and malignancy-related ulcers (3.12%). Associated risk factors for leg ulcer development included sensory neuropathy due to leprosy (33.33%), obesity (21.88%), hypertension (18.75%),

diabetes (18.75%), and malignancy (3.12%). Occupation-wise, the majority were labourers (31.26%), followed by housewives (34.38%), shopkeepers (28.12%), barbers (3.12%), and bus conductors (3.12%). Notably, 80% of venous ulcer patients reported a history of prolonged standing. Occupation with prolonged standing in the range of 10-12 hours is a risk factor for development of venous ulceration. Our study observed a male predominance in venous ulcers due to occupational factor.

Venous ulcers predominantly affected the medial (66.67%) and lateral (33.33%) malleoli. Trophic ulcers due to leprosy commonly occurred on the plantar surface (50%), great toe (30%), and heel (20%), whereas lower leg involvement was typical for ulcers associated with pyoderma gangrenosum, vasculitis, diabetes, and malignancy. Clinical features associated with venous ulcers included edema (40%), varicose veins (80%), eczema (60%), and lipodermatosclerosis (60%). Trophic ulcers were characterized by surrounding callosity (70%), palpable peripheral nerves (60%), and sensory impairment (100%). Pyoderma gangrenosum was often associated with surrounding edema and tenderness in 62.5% of patients. Prior history of purpura was noted in cases of vasculitis preceding ulcer development.

Patients clinically diagnosed with venous ulcers were underwent lower limb venous Doppler studies (5 patients), which revealed that 50% had perforator incompetency, 33.33% showed involvement of the long saphenous system, and another 16.67% exhibited thrombotic varicose veins.

Skin biopsy from ulcers was done in 20 patients of which 8 (40%) showed histopathological features consistent with pyoderma gangrenosum (massive derma-epidermal neutrophilic infiltration and secondary lymphocytic vasculitis), 5(25%) showed features of leukocytoclastic vasculitis (fibrinoid degeneration of vessel wall, perivascular lymphocytic infiltrate, extravasation of RBCs), 6 (30%) biopsy of venous ulcer showed non-specific findings (mixed inflammatory infiltrate, extravasation of RBCs), 1 (5%) showed features suggestive of squamous cell carcinoma (epidermal hyperplasia, keratin pearls in dermis).

Figure 1: Age Distribution

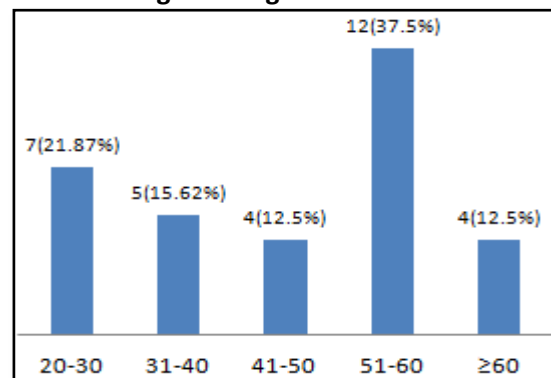


Figure 2: Gender Distribution

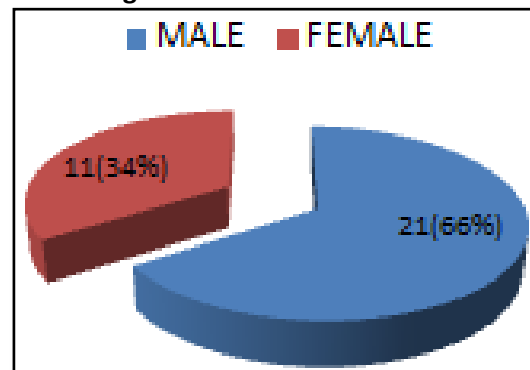


Figure 3: Etiological Distribution Of Leg Ulcers

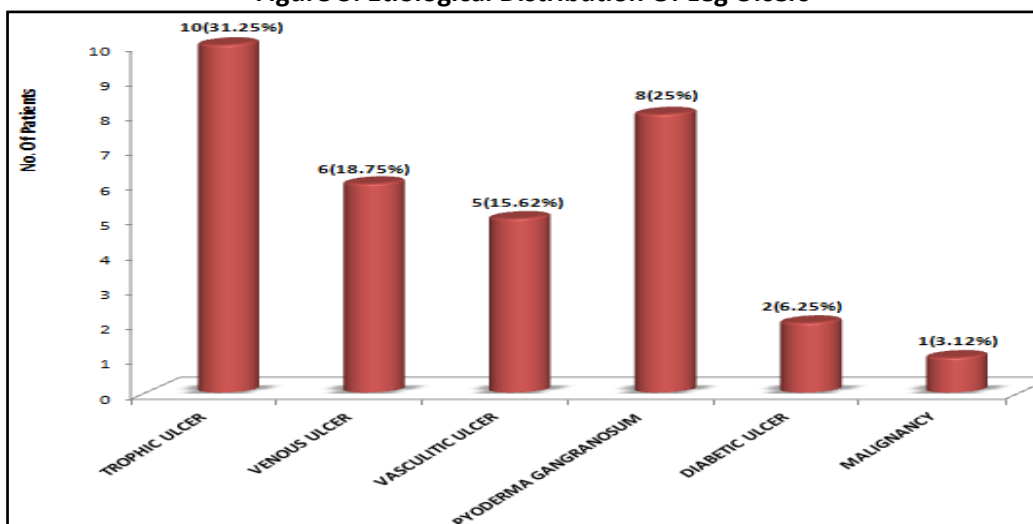


Figure 4: Risk Factors Associated With Various Types Of Leg Ulcers

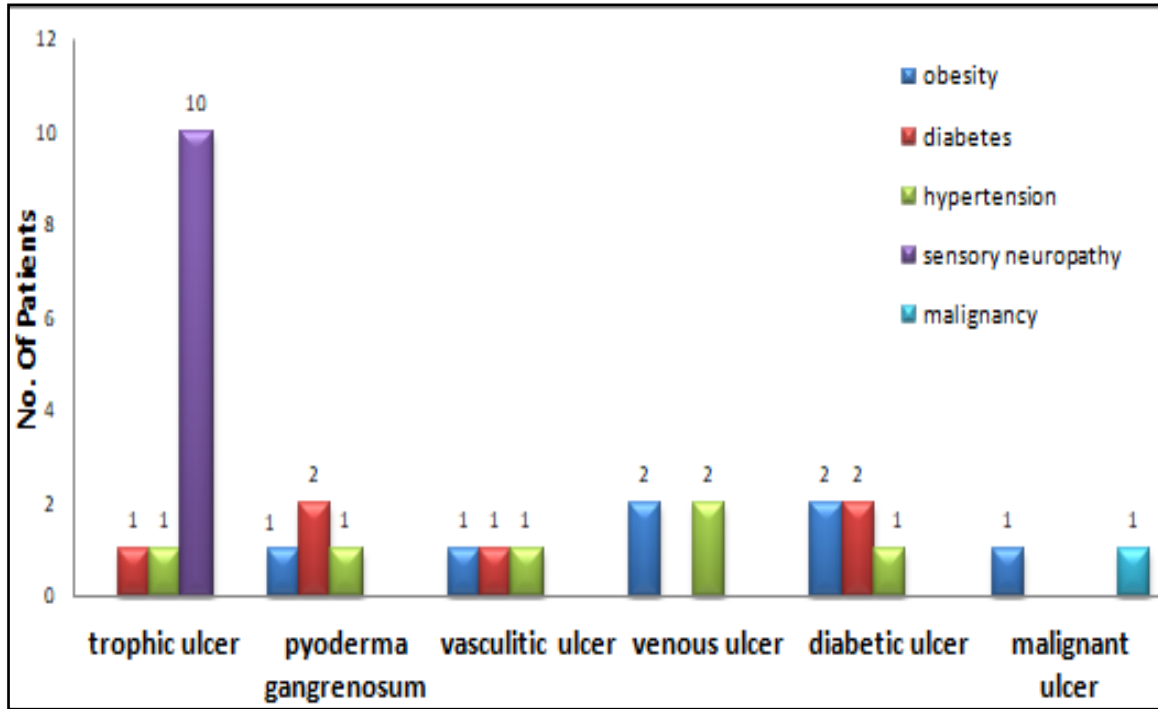


Figure 5: Types Of Ulcers Related To Prolonged Standing

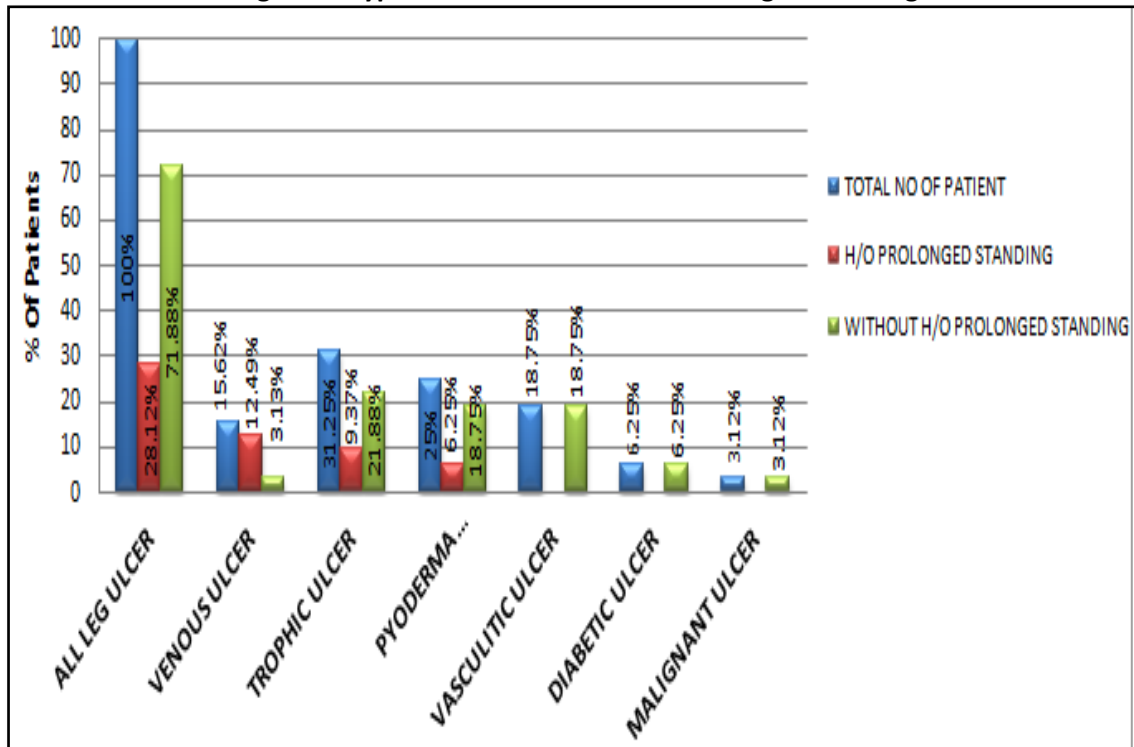


Table 1: Gender Wise Etiological Distribution Of Ulcer

Type Of Ulcer	Male	Female	Total
Trophic Ulcer	8	2	10
Pyoderma Gangrenosum	4	4	08
Venous Ulcer	5	0	05
Vasculitic Ulcer	3	3	06
Diabetic Ulcer	0	2	02
Malignancy	0	1	01
Total No. Of Patients	20	12	32

Table 2: Location Of Ulcers According To It's Types

Types Of Ulcers	Medial Malleoli	Lateral Malleoli	Planter Surface	Ball Of Great Toe	Heel	Feet	Leg
Trophic Ulcer	0	0	5	3	2	0	0
Pyoderma Gangrenosum	0	0	0	0	0	0	8
Venous Ulcer	4	2	0	0	0	0	0
Vasculitic Ulcer	0	0	0	0	0	0	5
Diabetic Ulcer	0	0	0	0	0	0	2
Malignancy	0	0	0	0	0	0	1

Figure 6: Pyoderma Gangrenosum



Figure 9: Histopathology Of Squamous Cell Carcinoma Shows Keratine Pearls In Dermis

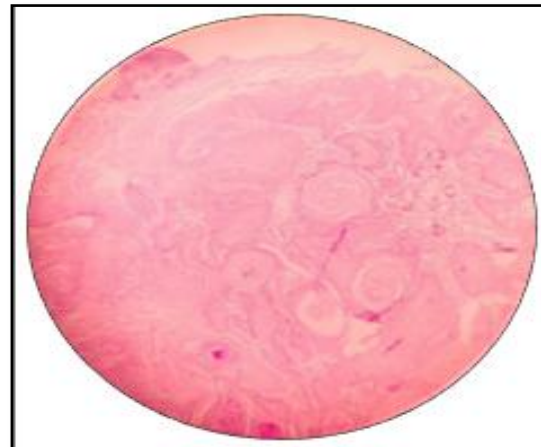
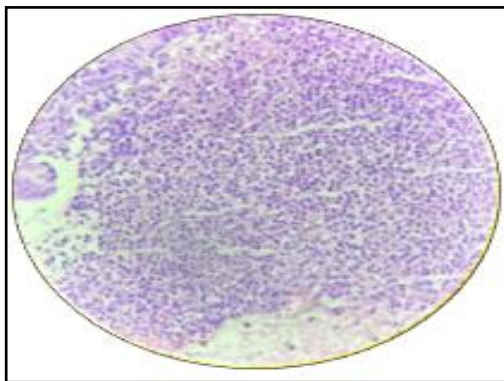


Figure 7: Histopathology Of Pyoderma Gangrenosum Shows Diffuse Neutrophilic Infiltration In Dermis



Discussion: A lower extremity ulcer manifests as an epithelial breach in skin integrity, typically localized between the knee and malleoli, sometimes penetrating through the dermis or deeper tissues of the lower leg. It often correlates with substantial morbidity, diminished quality of life, and considerable healthcare expenses.

In our study, patients age ranged from 20 to 88 years, with the most common age group being 51-60 years (37.5%) which is similar to study done by Kuntoji SB et al and vamsidhar et al^{2,3}.

Figure 8: Squamous Cell Carcinoma



Our study observed a male predominance due to occupational factors, with a male-to-female ratio of 1.9:1, aligning closely with 82% male predominance in study of Gobinda Chatterjee et al⁴.

Among the ulcer types observed, trophic ulcers due to leprosy were the most prevalent (31.25%), followed by pyoderma gangrenosum (25%), venous ulcers (18.75%), vasculitic ulcers (15.62%), diabetic ulcers (6.25%), and malignancy-related ulcers (3.12%), comparable to findings by Parikshita Dalai et al⁵.

We observed a Male predominance in venous ulcer due to occupational factors which is consistence with study of Gobinda Chatterjee et al⁴.

In cases of venous ulcers, 80% of patients reported prolonged standing histories, consistent with previous findings of Gobinda Chatterjee et al. Sensory neuropathy due to leprosy (33.33%), obesity (21.88%), hypertension (18.75%), diabetes (18.75%), and malignancy (3.12%) were identified as associated risk factors for leg ulcer development, which are similar to prior study of Gobinda Chatterjee et al indicating diabetes (14%), hypertension (12%), and obesity (35.29%) as risk factors⁴.

Regarding ulcer locations, venous ulcers predominantly affected the medial (66.67%) and lateral (33.33%) malleoli, while trophic ulcers due to leprosy were frequently found on the plantar surface (50%), great toe (30%), and heel (20%), consistent with Gobinda Chatterjee et al's observations⁴. While pyoderma gangrenosum primarily involved the lower leg which is comparable with study of Patel, M.S. et al⁶.

Histopathological analysis of 20 biopsies revealed features consistent with pyoderma gangrenosum in 8 cases (40%) (Marked dermoepidermal neutrophilic infiltration and secondary lymphocytic vasculitis), leukocytoclastic vasculitis in 5 cases (25%) (fibrinoid vessel wall degeneration, perivascular lymphocytic infiltration, RBC extravasation), and non-specific findings in venous ulcer biopsies (mixed inflammatory infiltrate, RBC extravasation), with one case (5%) suggestive of squamous cell carcinoma (epidermal hyperplasia, dermal keratin pearls)⁷.

Conclusion: We conclude that Effective management necessitates a thorough, interdisciplinary assessment to pinpoint the underlying factors and tailor treatment plans accordingly.

Educating patients on proper foot care and encouraging early medical intervention are crucial to improve outcomes.

Given the multifaceted nature of these ulcers, a comprehensive diagnostic approach and adherence to treatment plans are essential for successful management.

References:

1. Kaliyaperumal D, Jagadeeshkumar G, Kanagaraj P, Chandran V. Clinico-epidemiological study of chronic leg ulcers in a tertiary care referral center from Tamil Nadu, India. *Int J Res Dermatol* 2021;7:445-9.
2. Kuntoji SB, Guduru PK. Clinical and aetiological study of chronic lower limb ulcers. *Int Surg J* 2021;8:1839-43.
3. Dr. Lanka Vamsidhar, Dr. Gaddala Penchalaiah, Annaladasu Srilekha. A clinical study of ulcers of the leg: A prospective comparative study. *Int J Surg Sci* 2019;3(3):325-329.
4. Nag F, Chatterjee G, Ghosh A, De A. Clinico-Etiological Evaluation of Chronic Leg Ulcer in a Tertiary Care Center of Eastern India. *Indian J Dermatol*. 2020 Nov-Dec;65(6):495-499.
5. Parikshita Dalai et al." Study of aetiopathogenesis of chronic leg ulcers *JMSCR* (2020); vol.8(5); 543-59.
6. Patel, M. S. et al. "Clinico-histopathological Features of Pyoderma Gangrenosum: A Case Series." *NATIONAL JOURNAL OF LABORATORY MEDICINE* (2022) ; 11 (1);PS01-PS05.
7. Hofmann AG, Deinsberger J, Oszwald A, Weber B. The Histopathology of Leg Ulcers. *Dermatopathology*. 2024; 11(1):62-78.

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