

**Original Article****Clinicopathological Study of Chronic Lower Limb Ulcers and Management**

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Abstract

Introduction: Ulceration of the lower extremity is a common condition that causes significant discomfort and disability. An ulcer is defined as a disruption of the skin with erosion of the underlying subcutaneous tissue. This breach may extend further to the contiguous muscle and bone. The pathophysiological mechanisms underlying ulcer formation are multi-factorial and include neuropathy, infection, ischemia, and abnormal foot structure and biomechanics.

Aims and Objectives: To compare and analyse the distribution of age, sex, systemic disease in lower limb ulcers among 100 cases of the study group. To study the clinical features of various types of leg ulcers. To study the usefulness of applied investigations. To carefully manage the condition.

Patients and Methods: The present study "CLINICOPATHOLOGICAL STUDY OF CHRONIC LOWER LIMB ULCERS AND MANAGEMENT" was done at Department of General Surgery in Andhra Medical College, King George Hospital during the period between July 2015 to October 2017.

Source of Data: During this period all the lower limb ulcers which were admitted to various surgical units and attended surgical OPD at King George Hospital were included in this study.

Type of study: Prospective study with detail history taking & clinical examination

Statistical Analysis: Statistical analysis was done by using MS Excel 2007.

Observations and Results: The most common cause of lower limb ulcer was found to be Diabetes mellitus (29%) followed by traumatic ulcer (18%). Youngest patient was 13 years and oldest 70 years. Case volume was found to be maximum in the age group >50 years (46%) signifying that ulcers occur frequently in older age group. Males were found to be predominantly affected (70%). Diabetic ulcers were found to be highest in the age group >50 years (58.62%). There was marked male preponderance (86.2%). Venous ulcers were found to be greatest in the age group >50 years (64.2%). Males were found to be maximally affected (57.14%). Long saphenous system is the most common venous system affected in venous ulcers (85.72%). Trendelenberg procedure combined with GSV Stripping & split thickness skin graft was the procedure employed in treatment of all 12 cases. Peripheral vascular disease in the affected limb was diagnosed by absent peripheral arterial pulsations and Color Doppler. Atherosclerosis was found to be the most common cause of arterial ulcers (57.14%). Among Trophic ulcers, 60% were in diabetics, 20% in hemiplegics and 20% in Hansen's disease. Most common malignant ulcer in my study was Marjolin's ulcer (60%) all of which had history of burns in the past. Remaining were Squamous cell carcinoma (40%). The most common exudate in the present study is serous (54.16%) followed by purulent (43.76%) and greenish exudates (2.08%). Lower limb ulcers were found to be more common in left limb (60.49%). Out of total 100 patients of chronic lower limb ulcers,

41% underwent debridement, 25% underwent split skin graft, 14% underwent Trendelenburg operation with Great/short saphenous vein ligation with perforator ligation, 10% underwent amputation, 7% underwent lumbar sympathectomy and rest 3% underwent plastic surgery consultation for reconstruction.

Conclusion: Multi-disciplinary team approach and establishing specialized wound care centres appear to confer a significant, positive impact on reducing recurrent ulcerations and amputations. A detailed knowledge of the clinical picture, pathogenesis, diagnostic tests, treatment modalities, and differential diagnosis of leg ulcerations is essential in planning the optimal treatment strategy.

Keywords: chronic ulcer, diabetic ulcer, venous ulcer, debridement, grafting.

Introduction

Ulceration of the lower extremity is a common condition that causes significant discomfort and disability. An ulcer is defined as a disruption of the skin with erosion of the underlying subcutaneous tissue. This breach may extend further to the contiguous muscle and bone. The pathophysiological mechanisms underlying ulcer formation are multi-factorial and include neuropathy, infection, ischemia, and abnormal foot structure and biomechanics.

A chronic ulcer is defined as a full-thickness skin defect with no significant re-epithelialization for more than 4 weeks. Three etiologies of leg ulcerations are responsible for almost 95% of leg ulcers: about 40% to 80% are due to underlying venous disease, 10% to 20% are due to arterial insufficiency, and 15% to 25% are secondary to diabetes mellitus; in 10% to 15% of patients, a combination of two or more causes exists.

The disease entities that usually underlie leg ulceration (e.g., venous insufficiency, peripheral artery disease (PAD), diabetes mellitus) are associated with significant patient morbidity and mortality. A detailed knowledge of the clinical picture, pathogenesis, relevant diagnostic tests, treatment modalities, and differential diagnosis of leg ulcerations is essential in planning the optimal treatment strategy. An incorrect or delayed initial diagnosis may harm the patient and increase the risk of serious complications, including permanent disability and amputations.

The cost of treating leg ulcers is staggering. Because the disease affects a patient's lifestyle and attitude, the social cost of leg ulcers accrue. The ability to work may be temporarily or permanently affected by the condition. Hence treatment of these patients proves to be a challenging task.

Wound therapy has advanced considerably over the past few decades with the advent of innovative dressings and technologies, but the key factor in the management of chronic ulcers remains proper patient evaluation and correction of the underlying cause, once identified. Hence an attempt is made in the present study to address and assess various ulcers of lower limb.

Aims and Objectives

- To compare and analyse the distribution of age, sex, systemic disease in lower limb ulcers among 100 cases of the study group.
- To study the clinical features of various types of leg ulcers.
- To study the usefulness of applied investigations.
- To carefully manage the condition.

Patients and Methods

The present study "CLINICOPATHOLOGICAL STUDY OF CHRONIC LOWER LIMB ULCERS AND MANAGEMENT" was done at Department of General Surgery in Andhra Medical College, King George Hospital during the period between July 2015 to October 2017.

Source of data: During this period all the lower limb ulcers which were admitted to various surgical units and attended surgical OPD at King George Hospital were included in this study.

Type of study: Prospective study with detail history taking & clinical examination

- Investigations:

- Blood and urine investigations include Hb%, TC, DC, ESR, Serum Creatinine, Lipid profile, FBS/PPBS, screening tests for Hepatitis B,C

antigens & HIV, Urine for albumin, sugar, microscopy.

- Specific investigations: X-ray of the affected foot, Pus for culture & sensitivity from ulcer, Biopsy from the ulcer edge, Colour Doppler for arterial ulcers & diabetic ulcers, Duplex scanning for venous ulcers.

- Appropriate management of the ulcer by

- Debridement under anaesthesia followed by regular dressing of the ulcer done till its infective nature is curtailed and healthy granulation is seen.
- Evaluation of the preoperative status of Hb%, correction of anemia, hypoproteinemia, hypertension, glycemic control so that patient can be made fit for surgery.
- Surgical treatment according to the specifics of the case.
- Post-operative management regarding control of diabetes, hypertension, nutritional support, regular wound care.
- Rehabilitation through adjunctive foot wear was advised in selected indicated cases

- Counselling regarding foot care was provided to prevent future recurrence.

Inclusion Criteria: 100 cases of lower limb ulcers admitted to the Department of Surgery and attended to surgical OPD at King George Hospital.

Exclusion Criteria: Patients with acute medical complications like heart failure, renal failure, diabetic ketoacidosis; patients in the age group 0-12years.

Statistical Analysis

Statistical analysis was done by using MS Excel 2007.

Observations and Results

Figure 2: Sex distribution of lower limb ulcers

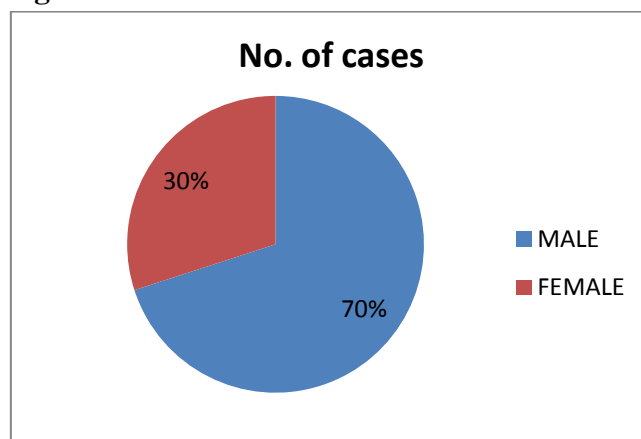


Figure 3: Age Distribution of Lower Limb Ulcers

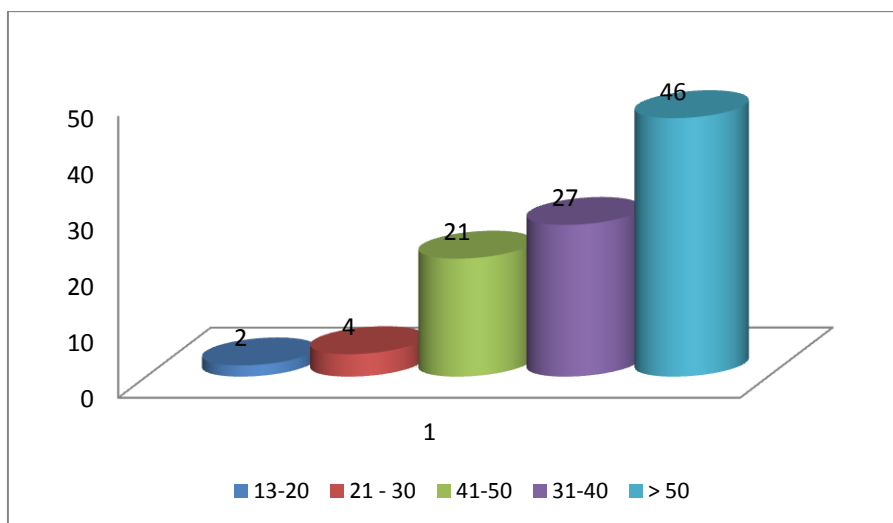


Table 9: Pathology in Arterial Ulcers

PATHOLOGY	No. of Cases	Percentage
TAO	6	42.86%
ATHEROSCLEROSIS	8	57.14%
TOTAL	14	100%

Figure 12 : Etiology in Trophic Ulcers

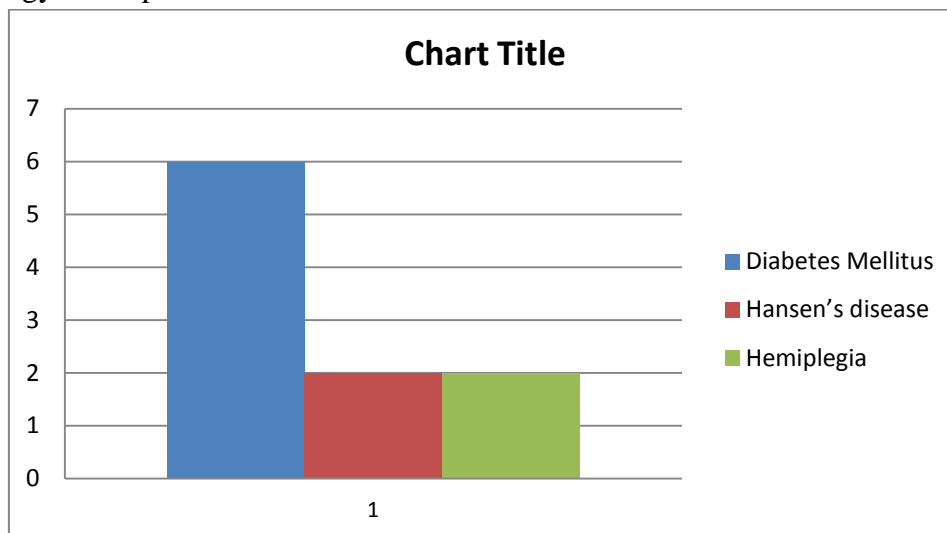


Table 13: Etiology of Malignant Ulcers

ETIOLOGY	No.OF CASES	PERCENTAGE(%)
MARJOLINS ULCER	3	60
SQUAMOUS CELL CARCINOMA	2	40
TOTAL	5	100

Table 15: Types of Bacteria Isolated From Ulcers

S. No.	PATHOGEN	No. of Cases	SENSITIVITY			RESISTANCE
			S1	S2	S3	
1	Staphylococcus	12	Amikacin	ceftriaxone	Amoxycillin/clavulanic acid	Ciprofloxacin
2	Klebsiella	7	Piperacillum+Tazobactam	Gentamicin	Cefoperazone+sulbactam	Ampicillin
3	Escherichia coli	4	Cefoperazone+sulbactam	Amikacin	Amoxycillin/clavulanic acid	Ampicillin
4	Streptococcus	8	Ceftriaxone	Cefalexin	Cefoperazone+sulbactam	Ciprofloxacin
5	Pseudomonas	4	Imipenem	Amikacin	Cefoperazone+sulbactam	Amoxycillin/clavulanic acid
TOTAL		35				

Figure 16: Healing Rates of Various types of Lower Limb Ulcers

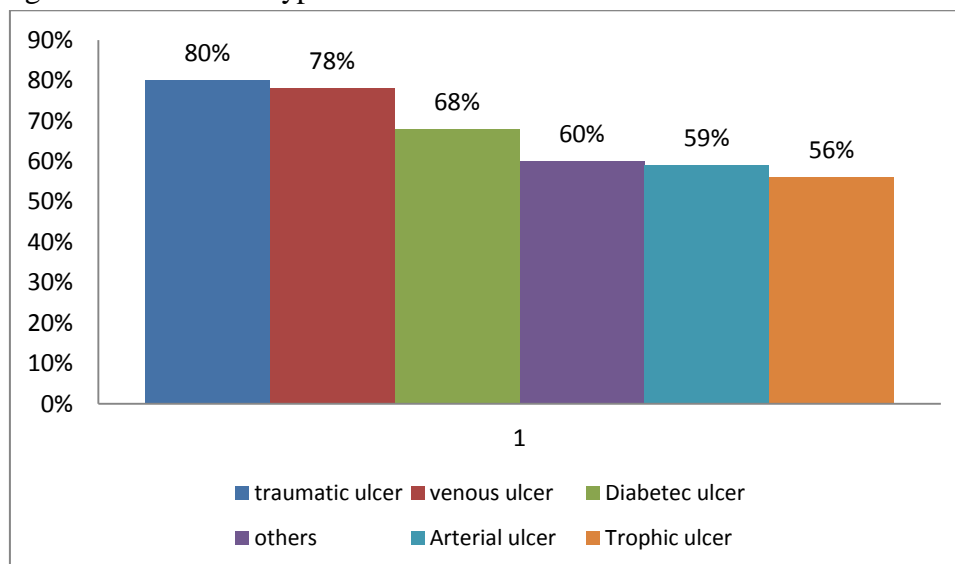
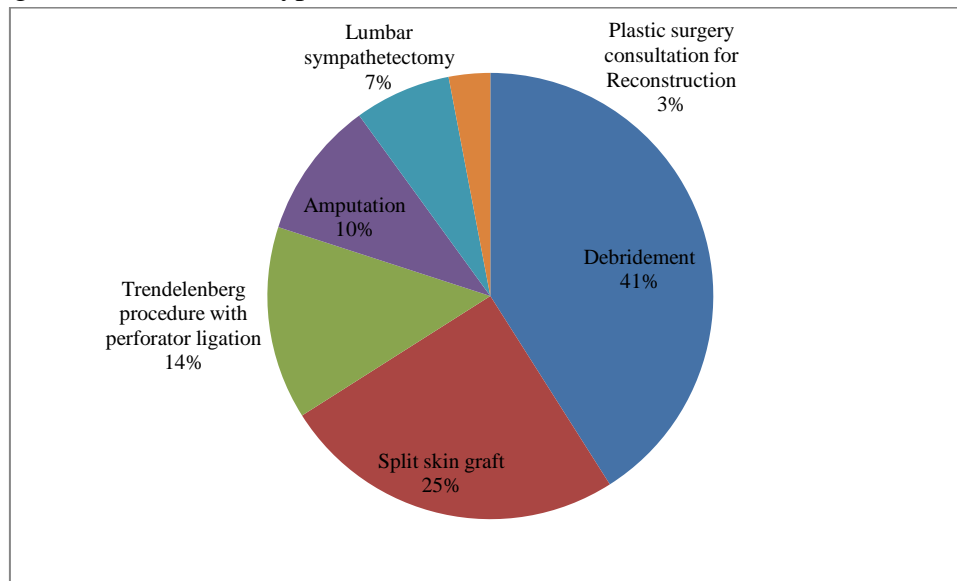


Figure 17: Management of Various Types of Lower Limb Ulcers

Discussion

A study from India shows that etiology of chronic wounds included systemic conditions such as diabetes, hypertension atherosclerosis, 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. The majority of these wounds were seen in farmers and other agricultural workers^{64,65}.

In this present study, lower limb ulcer with vascular etiology accounted for only 28% of all chronic ulcers. Out of this venous ulcers accounted for 14% and arterial ulcers accounted for 14%.

Chronic ulcers associated with diabetes accounted for nearly 29%. Traumatic ulcers accounted for 18% of the cases. Trophic ulcers accounted for 10% of cases. Malignant ulcers accounted for 5% and other ulcers for 10%.

Cornwall et al⁶⁶ in their study had 70% of patients over the age of 70 years. The median age of all patients in this study was 45 years and 44% of the patients over the age of 45 years and had 70% of the patients over the age of 70 years. But according to study done by Callam M. J.⁶⁷ the elderly are not the only population at risk:

Hansson Carita promulgated that peripheral vascular diseases occur seven times more

commonly in sixty year old patients than twenty year old⁶⁸.

Nevertheless in this study, arterial ulcers were found to be equal in both age groups i.e 41-50 years (35.7%); >50years age group (35.7%)

Venous ulcers were found to be more common in the age group >50 years which is in accordance with most of other Western studies.

Traumatic ulcers were found to be more common in age groups >41years with more incidence in males. Trophic ulcers were more common in diabetic patients (60%) when compared with hemiplegic (20%) and hansen's disease patients (20%)

Malignant ulcers were identified in 5 patients out of which 3 patients (60%) had marjolin's ulcers (post burns) while remaining 2 (40%) had primary squamous cell carcinoma.

Culture and sensitivity of the exudates was done in cases with purulent discharge. Among the different culture growths obtained, the most common organism was found to be *Staphylococcus aureus* (40%) which was more sensitive to Amikacin and followed by *Streptococcus pyogenes* (26.6%) which was more sensitive to ceftriaxone. *Pseudomonas* was isolated from 4 patients which was primarily sensitive to higher antibiotic i.e Imipenem.

Among the twenty nine patients with diabetic ulcers - 5 patients underwent split thickness skin

grafting, 10 patients underwent ray amputation of toe, 10 patients underwent debridement, 4 patients were managed conservatively. Mean graft uptake in case of diabetic ulcers is found to be 90%.

Previous studies reported 1-year venous ulcer recurrence rates as high as 69%. However, within the ESCHAR trial, recurrence rates for patients treated with compression and venous surgery were 12% at 1 year and 31% at 4 years. These were significantly lower than recurrence rates for patients treated with compression alone (28% at 1 year and 56% at 4 years)^{69,70}.

In this study, 41% of chronic lower limb ulcers underwent debridement out of which 30% had diabetic ulcer, 7% had traumatic ulcer and 4% had other causes like infected arterial, venous and trophic ulcers. 25% of chronic lower limb ulcers underwent split skin graft out of which 14% had venous ulcer who also underwent respective Greater saphenous vein +perforator ligation, Short saphenous veins +perforator ligation, 6% had traumatic ulcers and 5% had diabetic ulcers 7% of arterial ulcers with rest pain underwent lumbar sympathectomy and 3% of skin malignancies of lower limb that were operable was sent to plastic surgery for wide local excision and reconstruction.

Conclusion

In the present study, it is demonstrated that lower limb ulcers are debilitating and are seen most often in the elderly. They are therefore a major health issue in an aging population. Majority of the lower limb ulcers are caused by diabetes, followed by traumatic ulcers, venous ulcers and arterial ulcers. A detailed knowledge of the clinical picture, pathogenesis, diagnostic tests, treatment modalities, and differential diagnosis of leg ulcerations is essential in planning the optimal treatment strategy. A delayed diagnosis may harm the patient and increase the risk of serious complications, including permanent disability and amputations.

Patient education regarding their underlying condition and measures to be adopted by them to prevent recurrent ulceration play a prominent role

in reducing overall disease burden in the population.

Multi-disciplinary team approach and establishing specialised wound care centres appear to confer a significant, positive impact on reducing recurrent ulcerations and amputations.

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