Section: General Surgery

Original Research Article

# A CLINICAL STUDY OF LOWER LIMB ULCERS IN RURAL POPULATION OF ONGOLE

**Gowthami Kona[1], Lakshmireddy Sravanthi[1], David Salivendra[1], G.S.R. Hareesh[2], Shaik Imran Azad[3]**

[1]Assistant Professor, Department of General Surgery, Government Medical College, Ongole, Andhra Pradesh, India.
[2]Associate Professor, Department of General Surgery, Government Medical College, Ongole, Andhra Pradesh, India.
[3]Senior Resident, Department of General Surgery, Government Medical College, Ongole, Andhra Pradesh, India.

*Received* : 17/03/2024
*Received in revised form* : 30/04/2024
*Accepted* : 15/05/2024

*Keywords:*
*Chronic non-healing ulcer; Diabetic leg and foot ulcer; Varicose ulcer; Tropiculcer; Arterial ulcer; Malignant ulcer; Traumatic ulcer.*

Corresponding Author:
**Dr. G.S.R. Hareesh,**
Email: gsrhareesh@gmail.com

DOI: 10.47009/jamp.2024.6.3.68

Source of Support: Nil,
Conflict of Interest: None declared

*Int J Acad Med Pharm*
2024; 6 (3); 335-340

## Abstract

**Background:** Want to do a clinical study of lower limb ulcers in the rural population of Ongole. **Materials and Methods:** A prospective evaluation of 100 cases of lower limb ulcers treated with debridement, and regular dressings, addressing the underlying systemic disease, skin grafting, and amputation was conducted at Government Medical College, Ongole, during the period of January 23-January24. **Result:** Most of the patients with leg ulcers in a study group of 100 cases had a systemic disease that was highlighted, such as diabetes mellitus, venous disorders, atherosclerotic arterial occlusion, and malignancy. **Conclusion:** The majority of patients in our study (45%) who were 51 years of age or older developed leg and foot ulcers. The mean healing duration for the ulcers in skin transplant patients was 10.25 days, compared to 17.6 days in those who did not have skin grafting, in 5 out of 16 patients with traumatic ulcers. Staphylococcus was the most frequently isolated organism.

## INTRODUCTION

A chronic ulcer on the lower limb, particularly the leg and foot, is a common and widely dispersed ailment; they may be linked to numerous medical, surgical, and skin problems; the discomfort endured by patients is tremendous and is frequently observed. With occlusions like obesity, smoking, and diabetes, ulceration is more common.[1] A wound with "full thickness depth" and "slow healing tendency" is what is known as an ulcer. The depth and size of the wound do not alone explain the delayed healing tendency. To promote healing, however, the underlying pathologic cause must be treated. The aetiology, pathology, severity, and morbidity of leg ulcers cover a wide range. Diabetes, lower extremity arterial disease, and venous valve insufficiency are the main reasons. Infections, vasculitis, skin cancer, and ulcerating skin diseases including pyoderma gangrenosum are less common problems. Even unusual conditions can exist, as in the case of a recently identified vasculitis and hypercoagulability combo. It is crucial to be aware of the vast differential diagnosis of leg ulceration to treat individuals with leg ulcers effectively. Although there may be several causes, the anatomical nature of leg ulcers can occasionally present challenges that try the patience and ingenuity of the surgeons.[2] A great deal of knowledge has been acquired during the last three decades about the anatomy, physiology, pathology, and treatment of chronic leg ulcers. Patients with various ulcers caused by varied aetiologies and underlying systemic illnesses are frequently seen in medical settings.[3] This study includes a review of the literature on historical elements, the aetiology of chronic leg ulcers, their anatomy, pathology, pathophysiology, clinical characteristics, and diagnosis, as well as the numerous contemporary investigative studies necessary for the diagnosis. Patients admitted to Government Medical College, Ongole, with persistent leg ulcers were the subject of clinical research and histological analysis.

**Aims and Objectives**

- To analyse the distribution of age, sex, systemic disease and location of the ulcer.
- To analyse the symptoms and signs of a variety of leg ulcers.
- To analyse the need of investigations towards diagnosis.
- To manage the condition adequately.
- To avoid the incidence of leg ulceration in high-risk individuals

## MATERIALS AND METHODS

The material for this study was drawn from patients admitted to the Surgical Department, Government Medical College, Ongole.


ISSN (O): 2687-5365; ISSN (P): 2753-6556

For this investigation, a total of 100 cases were taken into account.

**Inclusion Criteria**

- Age > 18 years.
- All genders.
- Rural population.

**Exclusion Criteria**

- Age < 18 years.
- Urban population.

The onset, nature, and duration of the lesion, as well as socioeconomic status, systemic disorders, and occupational factors, were all specifically mentioned in the history that was gathered. A history of any ulcers resembling those was also documented. A comprehensive local and systemic evaluation was conducted. The quantity and location of ulcers on the leg or foot site, as well as any accompanying disorders such as varicose veins, eczema, or patches, were identified as being the morphological characteristics of ulcers. To make the study concise and minimize needless repeats, only pertinent positive findings were included, along with some significant negative findings.

## RESULTS

**Table 1: Distribution of different types of chronic leg Ulcers. total no. of patients studied: 100**

| Sl. No | Etiological Type | No. of patients | Percentage |
|---|---|---|---|
| 1. | Diabetic ulcer | 34 | 34% |
| 2. | Venous ulcer | 24 | 24% |
| 3. | Traumatic ulcer | 16 | 16% |
| 4. | Arterial ulcer | 12 | 12% |
| 5. | Malignant ulcer | 5 | 5% |
| 6. | Tropic ulcer | 3 | 3% |
| 7. | Other ulcers | 6 | 6% |

**Table 2: Distribution of chronic leg ulcers among different genders**

| Sex | No. of cases | Percentage |
|---|---|---|
| Male | 86 | 86% |
| Female | 14 | 14% |

**Table 3: Age distribution of chronic leg ulcers**

| Sl. No | Age group | Number of cases | Percentage |
|---|---|---|---|
| 1. | 12 – 20 above | 1 | 1% |
| 2. | 21 – 30 years | 6 | 6% |
| 3. | 31 – 40 years | 24 | 24% |
| 4. | 41 – 50 years | 24 | 24% |
| 5. | 51 – Above | 45 | 45% |

**Ulcers in association with diabetes mellitus:** Among 100 cases studied diabetes mellitus was seen in association with 34 cases.

**Table 4: Diabetic ulcers distribution**

| Sl. No | Side | No. of cases | Percentage |
|---|---|---|---|
| 1 | Right limb | 16 | 47.6% |
| 2 | Left limb | 17 | 50% |
| 3 | Bilateral | 1 | 2.94% |

**Table 5: Sex distribution of diabetic ulcers**

| Sex | No of cases | Percentage |
|---|---|---|
| Male | 26 | 76.48% |
| Female | 8 | 23.52% |

**Table 6: Age distribution of diabetic ulcers**

| Sl. No | Age group | No. of cases | Percentage |
|---|---|---|---|
| 1 | 12 – 30 years | 0 | 0% |
| 2 | 31 – 40 years | 3 | 8.9% |
| 3 | 41 – 50 years | 6 | 17.6% |
| 4 | 51 - above | 25 | 73.5% |
| | Total | 34 | 100% |

Venous Ulcers-Out of the 100 cases studied ulcers associated with venous causes accounted for 24 cases.

**Table 7: System affected in venous leg ulcers**

| System | No. of cases | Percentage |
|---|---|---|
| Long saphenous | 15 | 62.5 % |
| Short saphenous | 2 | 8.3% |
| Both | 5 | 20.8% |


ISSN (O): 2687-5365; ISSN (P): 2753-6556

| | | |
|---|---|---|
| Deep veins | 2 | 8.3% |

**Table 8: Age distribution of Venous Ulcers**

| Sl. No | Age group | No. of cases | Percentage |
|---|---|---|---|
| 1 | 12 – 30 years | 3 | 12.5% |
| 2 | 31 – 40 years | 12 | 50% |
| 3 | 41 – 50 years | 5 | 20.8% |
| 4 | 51 - above | 4 | 16.6% |

**Table 9: Sex distribution in Venous Ulcers**

| Sex | No. of cases | Percentage |
|---|---|---|
| Male | 22 | 91.6% |
| Female | 2 | 8.4% |

Arterial Ulcer-Out of 100 cases, 12 were arterial ulcers.

**Table 10: Age distribution of various types of arterial ulcers**

| Sl. No | Age group | No of cases | Percentage |
|---|---|---|---|
| 1 | 12 – 30 years | 0 | 0 |
| 2 | 31 – 40 years | 2 | 16.6% |
| 3 | 41 – 50 years | 6 | 50% |
| 4 | 51 % 70 years | 4 | 33.3% |

**Table 11: Pathology in Arterial Ulcers**

| Pathology | No of cases | Percentage |
|---|---|---|
| TAO | 5 | 41..6% |
| Atherosclerosis | 7 | 58.4% |

**Table 12: Location of the ulcer according to its types**

| Sl. No. | Type of ulcer | Gaiter Zone | Foot | Leg | Total |
|---|---|---|---|---|---|
| 1 | Diabetic | 0 (0%) | 30 (88.3%) | 4(11.7%) | 34 |
| 2 | Venous | 21(87.5%) | 1 (4.1%) | 2(8.3%) | 24 |
| 3 | Arterial | 0 (0%) | 12(100%) | 0 | 12 |
| 4 | Malignant | 0 (0%) | 3 (60%) | 2 (40%) | 5 |
| 5 | Others | 1(16.6%) | 4(66.66%) | 1(16.6%) | 6 |

**Table 13: Types of bacteria isolated from the ulcers**

| Sl. No | Pathogen | No of cases | Percentage |
|---|---|---|---|
| 1. | Staphylococcus | 20 | 20% |
| 2. | Klebsiella | 12 | 12% |
| 3. | Proteus | 10 | 10% |
| 4. | Streptococcus | 13 | 13% |
| 5. | Pseudomonas | 5 | 5% |
| 6. | E.coli | 6 | 6% |
| 7. | Sterile | 34 | 34% |

## DISCUSSION

The diabetic ulcers accounted for 34 patients (34%) of the 100 cases analysed, followed by ulcers secondary to venous illnesses (24%), traumatic ulcers (16 cases), arterial ulcers (12 cases), malignant ulcers (5%), tropic ulcers (3%), and miscellaneous ulcers (16 cases).[4-7]

According to Gilliland, venous ulcers account for up to 90% of leg ulcers and account for 95% of all leg ulcers. Only 5% to 10% of cases include arterial ulcers, while the remaining cases are caused by neuropathy or a combination of both. (Yound RJ).[8] According to the aforementioned images, men experienced persistent leg ulcers more frequently than women. However, there hasn't been a significant difference between men and women in previous investigations.

The age group of 51 and older were shown to have the highest incidence of leg ulcers in this study group. Since patients in the age range of 0 to 12 years are cared for by the paediatric surgery department, they are not included in this study.[9]

The oldest patient was 80 years old, and the youngest was 19. In the study by Cornwall et al,[10] 70% of the patients were above the age of 70, while 22% of the patients' ulcerations started before the age of 40, according to Cullum MJ's study.[11] From the above study, it is noted that diabetic ulcers were relatively common in the left limb accounting for 50% of cases. From the above study, it is noted that diabetic ulcers were relatively common in males accounting for 76.48% and less common in females accounting for only 23.52%. As noted above the maximum no of patients suffering from diabetic ulcers were in the age group of above 50 years accounting for about 73.5% of the cases. According to this study, the long saphenous system, which accounts for 62.5% of all venous ulcers, is by far the most often damaged. Venous ulcers were found to be the most common between the age group 31 – 50 years. From the above study, it is noted that diabetic ulcers were relatively


ISSN (O): 2687-5365; ISSN (P): 2753-6556

common in males accounting for 76.48% and less common in females accounting for only 23.52%. As noted above the maximum no of patients suffering from diabetic ulcers were in the age group of above 50 years accounting for about 73.5% of the cases. The most prevalent type of ulcer in people between the ages of 41 and 50 was discovered to be arterial ulcers. According to Hanson Carita, peripheral vascular disorders are seven times more common in 60-year-olds than in 70-year-olds. Atherosclerosis was discovered to be the more frequent connection, making about 58.4% of arterial ulcers. TAO accounted for 41.6% of the total relationship with arterial ulcers.

16 traumatic ulcers in total, 5 of which were linked to anaemia, were found in the study group. On the surface of the joint, one of these sores was visible. One of these ulcers developed as a result of subsequent infection after initial suturing closure. The remaining ulcers were avulsive in nature and had some degree of skin loss.

In the gaiter zone, venous ulcers were more prevalent (87.5%). Whereas 100% and 88.37%, respectively, of arterial and diabetic ulcers developed in the foot. Malignant ulcers affect the foot 60% of the time and the leg 40% of the time.

According to Hanson Carita, vascular insufficiency and/or diabetes are thought to be the main causes of ulcers beneath the line of the shoe and on the feet. Venous insufficiency is the main cause of ulcers in the gaiter zone. All cases were submitted for sensitivity and culture testing. Staphylococcus, which accounted for 20% of the bacteriological isolates, was discovered to be the most prevalent pathogen. Streptococcus came next, accounting for 13% of the total, Klebsiella for 12%, Proteus, E. coli, and pseudomonas, respectively, for 10%, 6%, and 5%. Staphylococcal infection is the most common infection in diabetic foot.

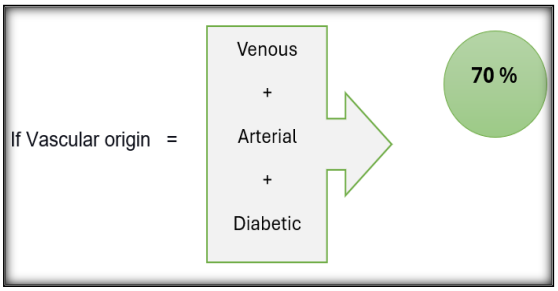
The majority of foot infections are polymicrobial, and staphylococcus is found in between 33% and 50% of cases (Norman Weinszweig and Raymond M. Dunn).

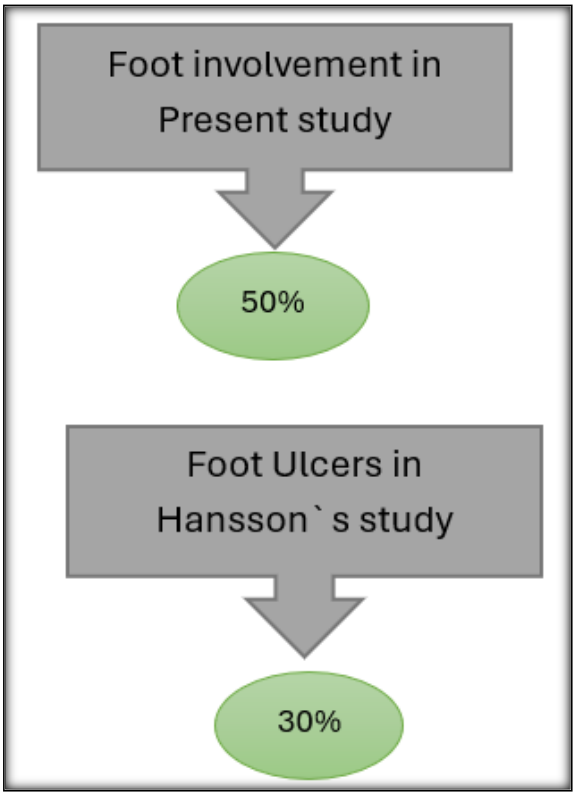
The majority of the participants in this study are patients from lower socioeconomic groups. Leg ulcer prevalence is likely between 0.18 and 1%. (Phillips, Tania et al.)4 Of these situations, 95% of people had a vascular aetiology (Gilliland) Among all chronic wounds, the lower extremity venous ulcer predominates the differential diagnosis, accounting for up to 90% of the cases (Burton S. Claude)6 (Callam M. J. et al.).[7] Only 36% of the chronic ulcers in this investigation had a vascular origin. Venous ulcers made up 24% of this total, whereas arterial ulcers made up 12%. Nearly 34% of chronic ulcers were linked to diabetes. Traumatic ulcers made up 16% of all cases. 6% of the ulcers were benign, while 5% were malignant.

1. Vascular ulcers - 36%.
Venous ulcers - 24%.
Arterial ulcers - 12%.
2. Diabetic ulcers - 34%.
3. Traumatic ulcers - 16%.
4. Malignant ulcers - 5%
5. Others - 6%
6. Trophic ulcers -3%

**As observed above, the present study was not comparable with the mentioned studies because of the following reasons:** There were too few participants in the study (100 patients) to make any meaningful comparisons. As opposed to this study, which was non-randomized and uncontrolled, the other studies that were published were population-based, controlled, randomised, or group-based studies among different specialities.

If diabetic ulcers were included in our analysis as vascular disorders rather than metabolic disorders, the percentage of vascular ulcers would have been 70%, which is somewhat equivalent to the study mentioned above. This is debatable, and the aetiology of leg ulcers in diabetes must take into account a number of interrelated aspects.




Decreased sensation from neuropathy or arterio-sclerotic lesions in major leg arteries are the two most important variables that contribute to the development of diabetic ulcers. Additionally,


ISSN (O): 2687-5365; ISSN (P): 2753-6556

according to Young J. R,[8] and Boyd A. M. et al,[12] different types of ulcers are distributed differently in different studies: venous ulcers are present in 70%–90% of cases, while arterial ulcers are present in 1%–5% of cases.

Studies by Hansson Carita on leg and foot ulcers indicate that vascular insufficiency and/or diabetes are the main causes of ulcers below the line of shoes. Venous insufficiency is the primary factor leading to ulcer development in the gaiter zone.[9] In the present study, the same kind of distribution of ulcers is seen, i.e. venous insufficiency is the leading cause for ulcers present in the gaiter zone, and ulcers below the line of shoes were caused mainly by arterial insufficiency and/or diabetes.

In our study, almost 50% of the patients had foot ulcers. This is a higher number than Hansson's study, which only found 30% of foot ulcers, most likely because our analysis included more arterial and diabetic ulcers.

In the study by Cornwall et al., the median age was 45 years, and 70% of the patients were above the age of 70.[13] However, a study by Callam M. J. found that not just the old population was in danger; 22% of the study group's population had ulceration start before the age of 40.7 31% of the individuals in our study experienced ulceration before turning 40.

**Table 14: Other Studies**

| Cornwall et al., | Callam M. J. | Present Study |
|---|---|---|
| Median Age - 45 years & 70% patients > 70 yrs | 22% Patients < 40 yrs. | 31% patients < 40 yrs. |

Peripheral vascular disorders (PVD) are 7 times more common in people 60 years and older than in persons 20 years and younger by Carita Hansson.[9] In this study, people in the 31–50 age range had the most arterial and venous ulcers. The reason for the discrepancy is that the study participants in the upper age range are working class, and they seek early medical attention because the ulcers they have impair their ability to work. Given that the majority of our patients are from the working class, venous ulcers were shown to be more prevalent in patients between the ages of 31 and 50, which is sooner than seen in Western studies. Again, compared to Western research, the age range of 31–50 years was shown to be too young for arterial ulcers to be more prevalent. Men [86%] were more impacted in our study than women [14%]. When we compare age-specific relative frequencies for all ulcers, no gender difference can be seen.

**Table 15: Gender Differences**

| Present Study | Other studies |
|---|---|
| Male-86%<br>Female-14% | No gender difference |

The application of elastic crepe bandages is crucial in the treatment of venous ulcers (Rightor M. Myers M. B).[14] In our trial, all 24 venous ulcer patients wore elastic crepe bandages that were 50% stretched, providing 14 mmHg of compression pressure beneath one layer. The management style of Bisgaard was connected to these patients. They were taken in for surgery when the ulcer healed. Only two of the 24 individuals had DVT, and the other 22 had varicose veins. 22 out of 24 patients with varicose veins had the Trenlenberg procedure, along with sub-fascial ligation, skin grafting, and two patients with deep vein thrombosis. Although the typical mean period for ulcer healing was 17.2 days, in the case of skin grafting, ulcers recovered in just 7 days.

Due to insufficient follow-up, the recurrence of venous ulcers was not established.

Among Venous ulcer patients - in present study

**Table 16: Venous ulcer**

| Crepe bandage | All 24 venous ulcer patients |
|---|---|
| 22 out of 24 patients | Trendelenburg procedure done |
| 2 patients | Developed DVT |
| Mean healing time | 17.2 days |
| STSG patients - healing time | 7 days |

In the treatment of diabetic ulcers, bovine plain insulin was paired with regular dressings, antibiotics, and debridement. Antibiotics, slough excision and/or debridement followed by dressings, as well as anti-diabetic therapy, were used to treat 30 out of 34 patients. Three patients had their legs amputated to save their lives, while one patient died from medical reasons. In six patients who underwent skin grafting, an ulcer took 10 days to heal. In all cases of diabetic ulcers, the average healing period was 26.43 days.

Diabetic ulcer discussion in the current study

**Table 17: Diabetic ulcer**

| Debridement, dressings, antibiotics | 30 patients |
|---|---|
| Amputation | 3 patients |
| Death due to medical cause | 1 patient |
| Average healing time | 26.43 days |
| STSG patients - healing time | 10 days |

Skin is the best dressing, as Lister once remarked. As a skin dressing, partial thickness grafts or many pinch grafts can be applied in cases of big ulcers or ulcers that don't heal (Gilland E. L., John H. N. Wolf).[5] Traumatic ulcers were discovered in 16 individuals, of whom three had anaemia, two had osteomyelitis of the calcaneum, and one had an ulcer brought on by an infected lesion that had been largely sutured. The other 4 patients all had avulsive wounds with skin loss. Out of 16 patients who experienced trauma, 5 underwent skin grafting. In one patient, the ankle joint was directly covered by an ulcer. The typical recovery duration for traumatic ulcers was 14.33 days. The mean healing duration was 17.6 days for patients treated conservatively and 10.25 days for skin graft recipients.

Traumatic ulcer discussion in the current study.


ISSN (O): 2687-5365; ISSN (P): 2753-6556

**Table 18: Traumatic Ulcer**

| | |
|---|---|
| Total traumatic ulcers | 16 cases |
| STSG Done in | 5 Cases |
| Typical recovery duration | 14.33 days |
| Mean healing time - conservatively | 17.6 days |
| Mean healing time in graft patients | 10.25 days |

## CONCLUSION

The majority of patients in our study (45%) who were 51 years of age or older developed leg and foot ulcers. The mean age was 44.28 years, while the median age was 45.

There was a greater male predominance or about 86%.

The foot, which was affected in almost 50% of cases, was the most frequent.

The majority of the venous ulcers, or about 87.5%, were located in the gaiter zone.

Approximately 88% of diabetic ulcers were located on the foot.

100 per cent of the arterial ulcers were in the foot.

The foot accounted for 60% of malignant and other ulcers, with the leg accounting for the remaining 40%.

Staphylococcus was the bacterium that was isolated from the ulcers most frequently (20% of the time).

Six patients had deeper tissues infected with gangrene, necessitating amputations to save their lives. Amputations were also performed on two patients who had malignant leg ulcers.

After the ulcers had healed, patients with varicose veins underwent an operation to treat them, and no recurrences were seen.

The mean healing duration for the ulcers in skin transplant patients was 10.25 days, compared to 17.6 days in those who did not have skin grafting, in 5 out of 16 patients with traumatic ulcers.

**Summary**

At a Rural Hospital, Ongole, clinical research of lower leg ulcers was conducted. This study revealed some crucial information. The most common cases were leg ulcers related to diabetes mellitus, venous valve dysfunction, arterial occlusion brought on by atherosclerosis and TAO, trophic ulcers, traumatic ulcers, ulcers brought on by snakebite, and specific infections including pyoderma gangrenosa.

Males are more likely to have a diabetic ulcer than females, and people 51 years of age and older are more likely to develop one on their left limb. Venous ulcers in the gaiter's zone were caused by venous congestion related to dysfunctional venous valves, most commonly in males between the ages of 31 and 40. It was discovered that atherosclerosis, or rising cholesterol levels causing artery obstruction, was a prevalent cause of arterial ulcers. The other cause of arterial foot ulcers, primarily in middle-aged people, was TAO, on the other hand. Traumatic ulcers affect both sexes and all age groups. Ulcers that didn't heal have anaemia as their underlying cause. Leprosy patients with trophic ulcers received anti-leprosy medications. A non-healing ulcer developed in a small number of cases as a result of a snake bite, which also caused cellulitis, tissue necrosis, and severe skin loss. The most frequent microorganisms found in the wounds were Klebsiella, pseudomonas, streptococcus, and Staphylococcus.

The primary etiological factors for leg and foot ulcers were underlying vascular diseases, despite diabetes being a significant risk factor. Diabetes mellitus is the condition most frequently linked to persistent leg ulcers. The most frequent factors were venous insufficiency and diabetes mellitus, even though the causes varied. Thus, the study of varied lower limb ulcer instances sparks a lot of curiosity and is perplexing in terms of how to manage these situations. There has been a tremendous improvement in the management of chronic lower leg ulcers thanks to the availability of a wide range of examinations, targeted antibiotics, and cutting-edge dressing techniques. The best treatment for persistent ulcers with large deficiencies is skin grafting.

To conclude, here is a saying -"I dressed the wound, but God healed it." - Ambrose Pare'

## REFERENCES


1. Sarkar PK, Ballantynes. Management of Leg Ulcer, Postgrad Med J 2001 672-82.
2. M Wayne, Venous Disorders, Textbook of Surgery. The Biological Basis of Modern Surgical Practice. 15th Edition W.B. Saunders Comp, 1997.
3. Linton RR, Post-phlebitic Ulceration of the Lower Extremity: Its aetiology and Surgical Treatment, Ann. Surgery, 138: 415, 1955.
4. Phillips Tania et al. A Study of the Impact of Leg Ulcers on Quality of Life –Financial, Social and Psychological Implications, J Am Acad Dermatol, 1994; 31: 49-53
5. Gilliland E. L., John H. N. et al. ABC of vascular diseases: Leg ulcers. Br Med J 303: 776-779.
6. Burton CS, Treatment of Leg Ulcers, Dermatol Clin, 1993; 11: 315-23
7. Callam MJ, et al., Chronic Ulcers of the Leg: Clinical History, Br Med J, 1987; 294: 1389-91.
8. Yound JR, 1983, Differential Diagnosis of Leg Ulcers, Card Vaso Clin, 13: 171-93.
9. Hansson Carita, Studies on Leg and Foot Ulcers, Stockholm, Acta Derm Venereol, 1988; 45.
10. Karacagil S, Lotberg A M, Granbo A. et al. Value of Duplex Imaging in Evaluation of Crural and Foot Arteries in Limbs with Sever Ischaemia –Prospective Comparison With Angiography. Eur J Endovasc Surg, Oct 1996: 300-3.
11. Cullum N, Nelson E et al., Health Technol Asses 2000, 5(9), I – 23.
12. Boyd AM et al., The Logical Management of Chronic Ulcers of the Leg, Angiology, 1952; 3: 207-215
13. Cornwall J. V., Dore C. J. et al. Leg ulcers – Epidemiology and Etiology, Br J Surg, 1986; 73: 693-696.
14. Rightor M, Myers MB, Cherry G, Relationship Between Oedema and Healing Rate of Stasis Ulcers of the Leg, Am J Surg, 124: 66




ISSN (O): 2687-5365; ISSN (P): 2753-6556