## **Research Article**

DOI: http://dx.doi.org/10.18203/2349-2902.isj20151540

# A study on the management of benign ulcers of leg and foot

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Received: 15 December 2015 Revised: 22 December 2015 Accepted: 28 December 2015

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#### **ABSTRACT**

**Background:** Several factors contribute to the development of leg ulcers. However majority of ulcers are due to venous insufficiency which accounts for about 80-85% of all cases. Frequency of venous ulcers increases with age as a result of several factors such as immobility and venous disease.

**Methods:** A descriptive study was carried out in Department of Surgery at a tertiary care hospital. Study subjects included 60 cases ulcers of leg and foot admitted to the Department of Surgery during the study period.

**Results:** The most common procedure done in our study group for varicose ulcers to treat the primary cause was combined procedure of Stripping of the vein and hook phlebectomy in 55% followed by Hook phlebectomy alone in 36% and stripping alone in 9%.

Conclusions: The treatment of the underlying cause is far more important than the choice of dressing.

Keywords: Ulcer, Diabetes, Venous, Arterial, Trauma, Dressings, Amputation

### INTRODUCTION

Leg ulcers are defined as discontinuity of the epidermis and dermis in the lower limb of more than 6 weeks duration. They are a common presentation in the elderly population and are associated with a negative impact on the quality of life of patients and they also cause a substantial burden on the health budget. Pathogenesis of leg ulceration is heterogeneous. Prevention strategies, early identification and proper management are paramount in improving quality of life of patients and reducing costs on an already strained health budget.

Accurate data concerning the prevalence of non-fatal diseases are difficult to obtain and statistics are usually derived from hospital attendance records and general practice surveys. The prevalence of a condition within a community may be affected by many factors such as the genetic constitution of its members, nutritional status, environmental factors, customs and occupation. In under

developed countries, the incidence of a condition may be greatly under estimated and apparent differences between populations may be affected by differences in age structures.

Diabetes Care Asia study has reported an incidence of 5-9% of active/healed ulcers and 1% of amputation among 2660 patients across 26 diabetes care centres in India.<sup>5</sup>

Studies conducted by Nelzen et al and Andersson et al reported that the prevalence of leg and foot ulcers varies between 0.11% and 0.32%.

Several factors contribute to the development of leg ulcers. However majority of ulcers are due to venous insufficiency which accounts for about 80-85% of all cases. <sup>8,9</sup> Frequency of venous ulcers increases with age as a result of several factors such as immobility and venous disease. <sup>8</sup> Other risk factors for venous ulceration include obesity, previous deep vein thrombosis, thrombophlebitis, previous fracture, and varicose veins. <sup>10</sup> Venous ulcers

(also referred to as varicose or stasis ulcer) are commonly found between the malleoli and lower calf and are associated with a shallow base covered with granulation tissue and fibrinoid material, and have irregular margins. 9,10

Today the management of leg ulcers focuses on correctly identifying the cause of ulcer, creating an optimum environment at the wound site for healing, improving factors that could delay healing, preventing complications to healing, and maintaining the healed tissue.<sup>11</sup>

Various treatment modalities are available for the management of different types of leg ulcers although no clinical trials comparing the efficacy of one treatment over the other have been done. Some of them have not got strong evidence to show that they actually improve healing, still awaiting further research.

#### **METHODS**

A descriptive study was carried out in Department of Surgery at a tertiary care hospital of Gulbarga, Karnataka. Study subjects included 60 cases ulcers of leg and foot admitted to the Department of Surgery during the study period.

The sampling technique adopted was non probability purposive sampling technique and this study was carried for 3 months from August 2015 to October 2015.

#### Inclusion criteria

- 60 cases of benign ulcers of leg and foot admitted to the Hospital during the study period.
- All age groups.

## Exclusion criteria

Malignant ulcers excluded

The method of study consists of detail history taking & clinical examination as per the proforma Investigations after taking written informed consent:

- Routine blood and urine investigations: Hb%, TC, DC, Peripheral smear, ESR, Renal function tests, Liver function tests, Lipid profile, FBS/PPBS, HIV, HB<sub>s</sub>Ag, VDRL test, Urine for albumin, sugars, ketone bodies, microscopy.
- Specific investigations: ABPI, X-ray of the chest and the affected foot, Wound culture & sensitivity, Biopsy from the ulcer edge, Skin biopsy, Duplex ultrasound imaging, FNAC (Fine Needle Aspiration Cytology) of the lymph node, Nerve biopsy if required.

Appropriate management of the ulcer and the primary cause:

- 1. Appropriate dressing materials were used depending on the characteristics of the ulcer.
- 2. Evaluation of the preoperative status in cases of chronic non healing ulcers.
- 3. Surgical treatment according to the merits of the case as decided by the attending surgeon under suitable anaesthesia as decided by the anaesthesiologists.
- Post-operative course and management of postoperative complications.
- 5. Rehabilitation through adjunctive foot wear was provided appropriately.
- 6. Education regarding foot care was provided to prevent future recurrence.

The data was entered in Microsoft excel and analysed in SPSS.

#### **RESULTS**

Among the 60 cases studied, the commonest was found to be diabetic ulcer accounting for 18 cases (30%) followed by venous ulcer (25%), traumatic ulcer (20%), arterial ulcer (18%), infective ulcer (5%) and trophic ulcer (2%).

Table 1: Distribution of curative surgical management for varicose ulcers.

Procedure	No. of cases	%
Stripping of GSV/SSV (Str)	1	9
Hook phlebectomy (HP)	4	36
Both (Str+HP)	6	55

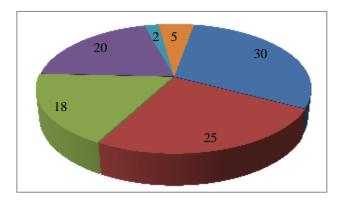


Figure 1: Percentage of distribution of various types of leg and foot ulcers.

The most common procedure done in our study group for varicose ulcers to treat the primary cause was combined procedure of Stripping of the vein and hook phlebectomy in 55% followed by Hook phlebectomy alone in 36% and Stripping alone in 9% (Table 1).

**Table 2: Distribution of types of amputation.** 

Procedure	No. of cases	%
Ray's amputation	9	60
Transmetatarsal amputation	4	26
Tarsometatarsal amputation	1	7
Below knee amputation	1	7

Among the 15 patients who underwent different types of amputation, Ray's amputation was the most commonly done amputation in 60%, followed by trans metatarsal amputation in 26%, Below-knee amputation in 7% and tars metatarsal amputation in 7% (Table 2).

Table 3: Distribution of patients requiring ulcer reconstruction.

Procedure	No. of cases	%
Split thickness skin grafting	8	73
Flaps	3	27

Among the 11 patients who underwent ulcer reconstruction, split thickness skin grafting was the common procedure done in 73% followed by reconstruction of ulcer using fasciocutaneous flaps in 27% (Table 3).

#### DISCUSSION

In our study, there were more men (62%) than women (38%) with leg and foot ulcers. However, no differences between sexes were found when age specific relative frequencies for all ulcers were compared.

Elastic crepe bandages are the most important forms of treatment for venous ulcer patients (Rightor M, Myers MB). <sup>12</sup> In our study all the 15 patients who had venous ulcers wore elastic crepe bandages providing of around 14 mmHg compression pressure under one layer. These patients were also subjected to local dressings and Bisgaard's line of management. Once the ulcers healed, they were taken up for surgery. Out of the 15 patients, 11 were due to varicose veins and 4 due to deep vein thrombosis. Out of 11 patients with varicose veins, 1 underwent surgery in form of ligation and stripping of GSV/SSV, 4 underwent hook phlebectomy and 6 underwent combined procedure of stripping and hook phlebectomy. 4 patients with deep vein thrombosis underwent skin grafting.

A study of recurrences of venous ulcers could not be made due to inadequate time follow up. Appropriate antidiabetic therapy which involves use of regular insulin, antibiotics, timely debridement and regular dressings, were the important methods of treatment for diabetic ulcers in our study. Out of the 18 patients with diabetic ulcers, majority of the patients underwent some kind of amputation, 2 underwent split thickness skin grafting, 3 underwent fasciocutaneous flap reconstruction and 1 ulcers healed with regular debridements.<sup>11</sup>

Hammer toe (10%) was the most common deformity found and all were present in cases with diabetic ulcers. Most of these patients had ulcers on the tip of toes which are invariably footwear related. This indicates that most of all neuropathic ulcers could be avoided very simply by footwear that is appropriately sized.

In this study, 39% of the patients with diabetic ulcers had neuropathy as documented by Semmes–Weinstein 5.07 Monofilament (10g) test. The incidence of neuropathy in other series: Goodman et al -62% and Walters DP et al -39.4%. <sup>13</sup>

Plain radiograph of the local part was done in all cases of leg and foot ulcer. Based on the radiological features described previously, osteomyelitis was found in 3% of the ulcers. Presence of osteomyelitis formed an important determinant for amputation and also the level of amputation.

In patients with severe limb threatening infections, following steps were undertaken as per the clinical practice guidelines: surgical debridement of all necrotic tissue, exploration and drainage of abscess, surgical resection of osteomyelitis, open wound management, and empirical antibiotic modified by culture directed antibiotics, repeated wound debridement, foot sparing reconstructive procedures and definitive amputation if necessary.

Culture and sensitivity of the exudates was done in all cases. Among the different culture growth obtained, the most common organism was streptococcus pyogenes (28%) and followed by staphylococcus aureus (26%). Infection is the main cause of delay in healing of the ulcer and when associated with ischemia (wet gangrene) frequently leads to emergency amputation.

Among the 11 patients who underwent ulcer reconstruction procedures, split thickness skin grafting (SSG) was the common procedure done in 8 patients (73%) followed by reconstruction of ulcer using fasciocutaneous flaps in the remaining 3 patients (27%). SSG was harvested from the thigh in all the cases, placed over red granulation tissue and anchored with mersilk/staplers.

# **CONCLUSION**

A comprehensive assessment of the patient, skin, vascular status, limb and ulcer is required to determine aetiology and to formulate an appropriate management plan.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

institutional ethics committee

#### **REFERENCES**

- Compression therapy for venous ulcers, effective health care. NHS centre for reviews and dissemination, University of New York. 1997;3(4).
- 2. Nelson EA, Jones J. Venous Leg Ulcers. BMJ Clin Evid. 2008;2008. pii: 1902.
- 3. Palfreyman S. Assessing the impact of venous ulceration on quality of life Nurs Times. Nurs Times. 2008;104(41):34-7.
- 4. Korber A, Schadendorf D, Dissemond J. Causes of leg ulcers: Analysis of data from a dermatologic wound care center. Hautarzt. 2009;60(6):483-8.
- 5. Boulton AJM. The diabetic foot: Neuropathic in etiology. Diab Med. 1990:7:852-8.
- 6. Andersson E, Hanson C, Swanbeck G. Leg and foot ulcers: an epidemiological survey. Acta dermatolovenereoloica. 1984;64:227-32.
- 7. Nelzen O, Bergqvist D, Lindhagen A. Leg ulcer etiology. A cross sectional population study. Journal of vascular surgery. 1991;14(4):557-64.

- 8. Simon A, Dix FP, McCollum CN. Management of venous leg ulcers. British Medical Journal. 2004;328(7452):1358-62.
- 9. Hickey J. Management of leg ulcers. http://www.theberries.ca/ARchives/2006Winter/ulce r\_management.htlm.
- 10. Grey JE, Harding KG, Enock S. Venous and arterial ulcers. BMJ. 2006;332(7537):347-50.
- 11. Morison M, Moffatt C. A colour guide to the assessment and management of leg ulcers. 2nd Ed. Aylesbury: Mosby. 1995:130.
- 12. Rightor M, Myers MB, Cherry G. Relationship Between Oedema and Healing Rate of Stasis Ulcers of the Leg. Am J Surg. 1972;124:666-8.
- 13. Walters DP, Gatling W, Mullee MA, Hill RD. The distribution and severity of diabetic foot disease: a community study with comparison to a non-diabetic group. Diabet Med. 1992;9:354-8.

Cite this article as: Shivakumar CR, Chimkode R. A study on the management of benign ulcers of leg and foot. Int Surg J 2016;3:101-4.