



AN ANALYSIS OF FOOT TROPHIC ULCERS AND THE OUTCOMES OF MANAGEMENT

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ABSTRACT Trophic ulcers are not uncommon problems, caused by external pressure to a part of the body due to vascular insufficiency loss of afferent nerve fibres, neural tube defects e.g. meningomyelocele and other diseases. Patients with neural tube defects presents with spectrum of functional and sensory deficit which impair the mobility, stress to the tissue duration / length of Stress, muscle power infection, moisture and nutrition of the patient. Once ulcer developed management is challenging. Needs collaboration of team work, awareness of ulcer risk, and preventive measures such as foot position / gait, offloading of pressure points: Pathogenesis in diabetic foot , sensory neuropathy autonomic neuropathy / dysfunction, microangiopathy, infection and osteomyelitis. A retrospective study over a period of 3 years, of the patients presenting with trophic ulcers on the feet to our department, were studied. The etiology, site of the ulcer, depth of the ulcer, treatment modalities and the outcomes were analysed. Different methods of reconstruction were used, and patients were benefitted in the long term, only when they adhered to using the specialized footwear provided.

KEYWORDS : trophic ulcers, heel ulcers, chronic ulcers, free flaps

Introduction

Management of patients with trophic ulcers is difficult ¹¹ not only because of its recurrent and recalcitrant nature but also due to the varied pathogenesis. To avoid devastating complications, systematic & methodical evaluation of pathogenesis should address each patient individually and the treatment protocol must be tailored to the needs of the patients.

Materials and methods

All the patients with trophic ulcer on the feet, attending the plastic surgery department, during the period of 2015 and 2016, were included in the study. Patients with uncontrolled diabetes, lepra reaction, and acute illness were excluded from the study. A total number of 27 patients were thus included in the study.

A total of 27 patients were admitted with trophic ulcers on the feet during the period of 2015, 2016. The age group distribution (Fig 1) was as follows, 8 patients in the age group of 0 – 10 years, 2 patients in the age group of 10-20. No patients in the 20 – 30 years age group, 2 patients and 3 patients in the 30 – 40 years and 40 – 50 years age groups respectively. There were 12 patients in the above 50 years age group.

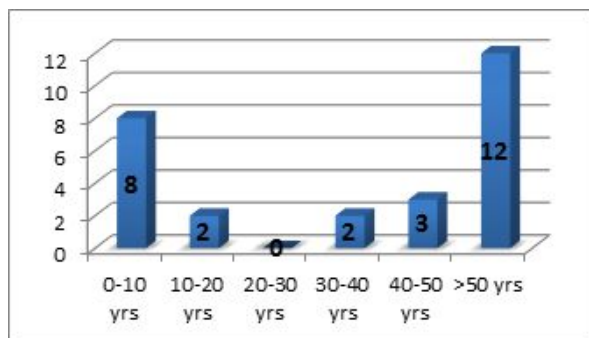


Fig 1: Age distribution of patients presenting with trophic ulcers Sex distribution: Of the 27 patients, 12 were female and 15 male.

The etiology of the trophic ulcer was studied. 10 patients had neurogenic causes like meningomyelocele, post spinal injuries. 15 patients had diabetic foot, with trophic ulcer. 2 patients had post traumatic sequelae in the form of breakdown of skin graft in the weight bearing aspect of the sole, leading to ulceration, one over the metatarsal head, and another on the heel.

The site of the trophic ulcer was analysed according to three areas; the heel, the lateral border of the foot, and the forefoot. 16 patients had ulcers in the weight-bearing aspect of the heel, 5 patients had trophic

ulcers on the forefoot, and 6 patients had trophic ulcers on the lateral aspect of the foot. All the patients with trophic ulcers on the lateral aspect of the feet were children, who had sequelae of meningomyelocele.

Reconstructive procedures done (Fig 2); Free flaps were done for 5 patients, rotation flaps for 6 patients, medial instep flap for 8 patients, skin grafting for 2 patients, distant flap for 2 patients and filleted flap for 4 patients. Among the free flaps used for reconstruction, anterolateral thigh flap was used for 2 patients, free gracilis muscle flap with skin grafting was used for 2 patients, and vascularised vastus lateralis muscle flap and skin graft for 1 patient (Fig 3,4,5).

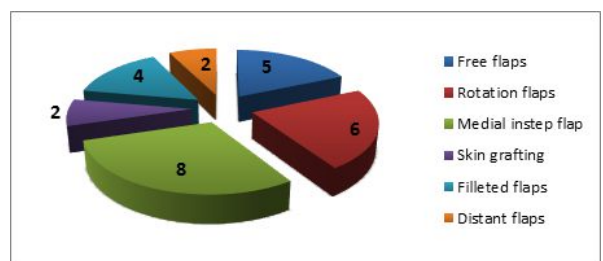


Fig 2: Reconstructive procedures done

The recurrence rate of the ulcers was studied in the patients who were followed up for a minimum period of 6 months. There was 1 recurrence of the ulcer in a 65 year old diabetic patient who had stopped wearing the footwear as it was tight, and did not come for follow-up.



Fig 3: Distant flap: Cross thigh flap for recurrent trophic ulcer reconstruction



Fig 4: Free vascularised gracilis muscle flap with skin graft after preliminary debridement stage



Fig 5: Medial Instep flap cover

Discussion

Trophic ulcer is a pressure ulcer due to recurrent external trauma to the part of a body, which is in poor condition due to loss of afferent nerve fibres, vascular inefficiency and poor nutrition. The cause of the trophic ulcer could be neurogenic, vascular causes or systemic causes. Neurogenic causes like neural tube defects^[2], Hansen's disease, diabetes, paraplegia, neuropathies can cause trophic ulcers. Vascular causes include arterial insufficiency by conditions like peripheral vascular disease, arteriosclerosis, microangiopathies, venous conditions like venous stasis ulcers. Systemic causes like malnutrition, avitaminosis, B12 deficiency and gout may also predispose to trophic ulceration.

The successful management of trophic ulcer would be proper identification of aetiology, and the local and systemic factors contributing to the nonhealing nature of the chronic ulcer. The treatment options must include a multidisciplinary approach, involving the neurologist, physiotherapist, orthotist and prosthetist, occupational therapist and rehabilitation personnel. Surgical options must be decided, which are appropriate for the patient^[3], and which will be capable of providing a durable skin cover which can bear weight.

Even after the surgical plan has been made, the optimum conditions must prevail in the ulcer, before the actual surgery can be performed. Infection control is an important factor to be considered before surgery. Wound debridement till viable wound bed is reached is an important part of the procedure. The debridement may be done just preceding the reconstruction in a single stage, or can precede the reconstruction procedure in a different stage. Adjuncts to wound healing, such as Negative pressure wound therapy^[4] can be considered for healthy granulation tissue formation.

The reconstructive options for the ulcers range from skin grafting, local flaps^[5], regional flaps or free flaps depending upon the tissue need & availability^[6]. The common flaps done for the foot ulcers are local transposition flap, medial plantar artery flap^[7], fillet flap, distally based sural Neuro cutaneous flap, V Y plantar flaps, local muscle flaps and free flaps. The choice of free flaps may be gracilis muscle flap with skin graft or anterolateral thigh flap.

It must also be remembered that life style modifications, specialized footwear that can provide offloading of the pressure on the weight bearing aspect of the foot are also important (Fig 6).



Fig 6: Components of the footwear provided. (a) Knee brace (b) Foot drop splint (c) Off loading sole (d) Microcellular rubber shoe

Regular foot care must be done rigorously. Offloading^[8] in a graded manner from bed rest limb elevation crutches wheel chair and dependence to mobile offloading. Offloading device to specialised foot wear should provide constant pressure reduction optimal cosmetic acceptance and function. Offloading device is successful if it is used consistently with good compliance, hence patients awareness and compliance are essential for getting good long term results.

Regular follow up for assessment of the healed scars, and examination to rule out any new deformities, any changes in the walking pattern must be methodically done.

Conclusion

Care of the patients with trophic ulcer needs multi disciplinary approach from physician general surgeon orthopaedician, plastic surgeon, dietician, physiotherapist, prosthetist and orthotist. A surgical reconstruction with a durable skin cover, followed up with offloading of pressure points by specialised foot wears to avoid prolonged and recurrent stress to the tissue, will ensure long term freedom from recurrence of ulceration.

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