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MEDIAL SURAL ARTERY FLAP RECONSTRUCTION FOR DIABETIC FOOT ULCER : A CASE REPORT

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ABSTRACT Diabetes is the leading cause of non traumatic lower extremity amputations resulting from atherosclerosis of the arteries. According to the International Working Group on the Diabetic Foot (IWGDF), a diabetic foot ulcer (DFU) is a full-thickness wound penetrating through the dermis (the deep vascular and collagenous inner layer of the skin) located below the ankle in a diabetic patient. The sural fasciocutaneous flap is useful for the treatment of severe and complex injuries in diabetic lower limbs. It is simple to dissect , does not compromise a major artery and has low donor morbidity. We present the case of a 38 year old gentleman who presented to us with Right foot diabetic ulcer progressing over a duration of 2 months . After initial debridement of wound patient underwent a trans metatarsal (foot) amputation followed by vacuum dressing and a delayed primary closure of wound using a medial sural artery flap.

KEYWORDS : Diabetic Foot , Sural Artery Flap , Tibial Flap

INTRODUCTION

Diabetes Mellitus is the leading cause of lower extremity amputation world wide. Approximately 80% of all lower extremity amputations are precipitated by foot ulceration.There were 366 million people who have diabetes worldwide in 2011, and this is expected to rise to 552 million by 2030.[1] India is the second largest contributor to the world's diabetic load after China.Diabetic complications may be disabling or even life-threatening.[3] According to the International Working Group on the Diabetic Foot (IWGDF), a diabetic foot ulcer (DFU) is a full-thickness wound penetrating through the dermis (the deep vascular and collagenous inner layer of the skin) located below the ankle in a diabetic patient.[4] Eight out of 10 non traumatic limb amputations are attributable to diabetes, of which 85% are due to DFU.[5] People with foot problems and diabetes mellitus have 15 times the increased risk of undergoing a lower extremity amputation compared to those without diabetes.

CASE REPORT

A 38 year old gentleman presented with a history of swelling and ulceration over the proximal end of Right foot involving the plantar and dorsal aspect and the Right great toe for 2 months. History of shoe bite was present 2 months back. Patient was a known diabetic for 2 years and had history of not taking oral hypoglycaemic agents for the past 2 months. The patient had a history of pain over the right foot , with no history of fever. History of foul smelling discharge was present from the ulcer. Patient had no history of loss of sensation over the Right foot. On examination, there was a 2X2cm ulcer over the dorm of 1st webbed space of Right foot. There was edema and hyper pigmented discolouration over dorsum of foot . Dorsalis Pedis pulsations were not felt. Sensory examination was intact. Left foot examination appeared normal.

Blood investigations showed an increased total count , increased urea and creatinine and increased RBS. Serum electrolytes were deranged (hypokalemia).

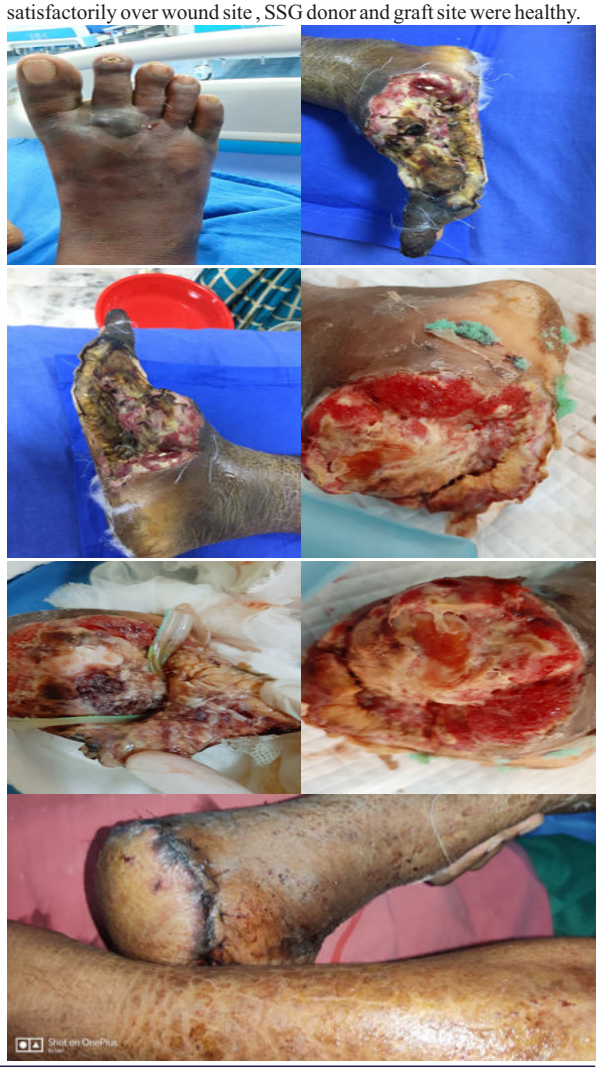
X-Ray of Right foot showed osteomyelitis changes of Right great toe and first to fourth metatarsals.

The patient was taken up for a transmetatarsal amputation under spinal anaesthesia.

Following surgery , appropriate intravenous antibiotics were administered based on wound culture and sensitivity. The wound was treated with a vacuum dressing which was changed once in 4 days . Following 3 changes of vacuum dressing , the patient was posted for delayed primary closure of wound using a medial sural artery crossed leg flap from the opposite lower limb. The sural flap was used to close the Right foot ulcer and a SSG harvested from Right thigh was used to cover the flap site over the posterior aspect of left leg.

The patient was immobilised for the subsequent 3 weeks and DVT prophylaxis was given , following which he was taken up for a revision of the flap.

Post surgery, there was no flap necrosis and it was taken up satisfactorily over wound site , SSG donor and graft site were healthy.



DISCUSSION

In India, DFUs affect 15% of diabetics during their lifetime. In the past, microvascular obliteration or small vessel disease was thought to result in poor skin perfusion and necrosis. We now understand ulceration to be a result of a complex interplay between various sequelae of diabetes mellitus, often with large artery atherosclerosis.

Nerve damage in diabetics can result in a sensory dysfunction. The loss of protective sensation in the foot can result in injury from abnormal repetitive stress, poorly applied footwear, and foreign objects. Diabetics with reduced sensation are more likely to injure their feet and are less likely to notice injuries, resulting in delayed treatment. Peripheral neuropathy can also lead to changes in foot structure. Denervation of the intrinsic arch muscles can cause the toes to be pulled back by the now unopposed long tendons, leading to hammer toe formation. Plantar and intrinsic muscle atrophies result in prominent metatarsal heads and less foot surface area overall to bear weight, a common source of pressure ulceration. Repetitive injury to a malformed insensitive foot leads to ligament laxity and further abnormal pressure points such as those seen in Charcot deformity. Autonomic neuropathy produces dry skin and decreased sweating. Callus formation is thus initiated, triggering abnormal pressure points and ulcer formation. All these factors increase the chance for ulceration and infection.

Resurfacing shallow defects over the ankle and foot with an appropriately thin flap is a common but difficult task. This can be accomplished by harvesting the medial sural artery perforator flap from the medial aspect of the upper calf. Based on the musculocutaneous perforator of the medial sural artery, this flap preserves the medial gastrocnemius muscle and avoids unnecessary flap bulkiness.

The main advantage of this flap is that it provides a thin and pliable coverage to achieve better accuracy in the reconstructive site. Other advantages include maintaining the function of the medial gastrocnemius muscle, providing a long vascular pedicle, and avoiding the need to sacrifice major arteries of the leg. The main disadvantages are the tedious process of intramuscular retrograde dissection of the perforator and the unsightly skin graft over the medial calf.

CONCLUSION

Cross-leg flaps are a useful reconstructive option for complex lower limb defects when free flaps cannot be performed owing to vessel damage.

Over the past two decades, the distally based neurocutaneous sural flap has become the best known neurocutaneous flap of the leg. When microsurgical expertise is not available or feasible, the sural flap has become the mainstay of reconstruction for lower leg, ankle and foot defects.

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