

MANAGEMENT OF POSTBURN LYMPHEDEMA BY Z-PLASTY

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ABSTRACT

Introduction: Circumferential lower limb scarring acts like a ring constriction and produces distal lymphedema.

Case: A 35 yr old lady presented with left lower limb edema of 5yrs duration secondary to burn wound infection. She was managed with Manual massage, Graduated compression stockings, Wound care and Zplasty.

Result: Lymphedema reduced and symptoms improved.

Conclusion: The skin burn wound has to be treated early and appropriately to minimize complications.

Key words: Constriction ring, Lymphedema, Z-plasty.

INTRODUCTION

The management of burn wound needs to be done with utmost care to prevent complications. Janzekovic procedure of tangential excision with immediate skin grafting helps to heal the wound faster. The procedure causes considerable blood loss and has to be done with caution. An unusual presentation of post burn skin infection of lower limb which healed by secondary intention and presented as lymphedema of lower limb is discussed. Lymphedema can develop when there is obstruction to its flow. Circumferential lower limb burn scarring impedes lymph flow and can cause distal edema of foot and leg. The scar band needs to be released and flaps need to be fashioned to augment lymphatic flow. The circumferential scarring in this patient acted like a ring constriction syndrome and produced distal lymphedema.

CASE

A 35 yrs old lady complained of left lower limb edema of five years duration. She had sustained flame burn to the area ten years ago. The patient lives in a remote location without access to proper surgical care. The burn wound which was managed conservatively and was complicated by superficial skin and subcutaneous infection. Patient does not give history of repeated lower limb swellings suggestive of filariasis prior to the burn. On examination, there was no active sign of infection. A near circumferential scarring on left lower limb was present. The left leg and foot was swollen and non-pitting. Skin changes like hyperpigmentation and irregular scarring on anterior aspect of lower leg was also present (Fig.1). The other limb was normal. The patient was admitted and leg



Fig.1: Left lower limb at the time of admission

elevation was done after applying graded compression elastic stockings. The edematous limb was cleaned daily with dilute betadine solution and saline and mupirocin ointment was applied topically. Manual limb massage was given daily for 10 days by our physiotherapist. The limb girth measurement and weight of the patient was recorded daily. The limb girth reduced by five inches in ten days (Fig.2). The patient's weight reduced by 2 kg and remained the same till discharge. The reduction in limb girth helped in making the skin supple. The patient was operated upon and the scar band was excised in toto. Multiple small Z-plasty was done to augment lymphatic flow. The skin below the constriction band became supple and swelling of the leg and foot reduced (Fig.3). The graded compression dressing and foot end elevation was continued. There was further reduction by two inches in limb girth on 10th postoperative day. Patient was discharged with compression stockings.

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DISCUSSION

Lymphedema is a chronic condition and difficult to treat. The reason for development of edema is imbalance between demand and capacity of lymphatic circulation. The progressive obstruction of the lymphatic system produces interstitial fluid rich in protein. This causes



Fig.2: Left lower limb after Manual massage



Fig.3: 14 days post op - after Z plasty

inflammation, adipose tissue hypertrophy and fibrosis. The swelling of affected region can cause deformation, decreased mobility and function. Lymphedema can occur primary or secondary to malignancy, radiation, block dissection and infection.^[1,2,3]

The proposed Clinical classification of lymphedema by International Society of Lymphology^[4] is

- ♦ Stage 0: Sub clinical infection where swelling is not evident even though impaired lymph transport.
- ♦ Stage I: Limb edema subsides on elevation. Pitting present
- ♦ Stage II: Limb elevation rarely reduces edema. Pitting present or absent
- ♦ Stage III: Pitting absent. Trophic skin changes such as warty over growths, acanthosis, hyperkeratosis, papillomatosis and skin ulcer can occur.

The case described was in Stage III as described by the above classification.

Classical signs in Lymphedema of lower limb on

physical examinations are

(i) Peau d' orange changes of the skin (because of cutaneous and subcutaneous fibrosis).

(ii) Positive Stemmer sign (inability to grasp the skin of the dorsum of the second digit of the feet)

Lymphoscintigraphy is considered the gold standard for diagnosing lymphedema. The investigation is done by injecting radio labeled colloid intradermally in distal edematous limb and then imaging lymphatic vasculature. The study provides lymphatic anatomy and its function. Typical abnormalities seen are absent or delayed radiotracer transport, cutaneous flare, dermal diffusion or back flow and poorly visualized lymph nodes. MRI is useful in diagnosis of lymphedema without radiation exposure. Classical signs seen on MRI are skin thickening, "Honey combing" of subcutaneous tissue, epifascial fluid lakes and absence of edema with in muscular compartments.

The current international standard of care for lymphedema is formalized in a 2013 consensus document of the International Society of Lymphology. Treatment of lymphedema is by decongestive therapy in two-phase approach. The first phase is reduction of swelling which involves proper skin care (cleansing, low pH lotions, emollients), manual massage to drain lymph, range of motion exercises and compression with multilayered bandages. The second phase is the long-term maintenance of volume, which includes skin care, regular exercises, Graduated compression stockings, limb elevation and pneumatic lymph drainage. A graduated compression stocking with highest level of compression (20-60 mmHg) that the patient can tolerate is most beneficial. However, lower compression can be used for milder lymphedema or general leg edema.^[5,6]

Decongestive treatment would increase lymph flow, augment lymphatic contractility and reduce extremity lymph fluid. Benzopyrene is commonly used drug which acts by increasing proteolysis by the macrophages. The use of the drug is controversial as long-term use of benzopyrene is hepatotoxic. Another commonly used drug is diuretics. Diuretics produce immediate relief by removing intravascular or interstitial fluid but this can be deleterious by producing increased fibrosis due to protein accumulation.

For patient not responding to decongestive therapy, surgery is an option. Surgical options available are excisional approach, suction assisted lipectomy and microsurgical lymphatic anastomosis. For circumferential contracture lymphedema, surgical approaches are Z plasty, rectangular flaps and simple excisional surgery.^[7,8,9]

CONCLUSION

Burns need to be treated in tertiary centers for proper healing. The skin burn wound has to be treated early and appropriately to minimize complications.

Circumferential full thickness limb burn can produce circumferential contracture. The circumferential contracture can disturb lymphatic drainage producing distal edema. Presence of unburned bridge of skin on limb may help to avoid distal lymphedema. Early proper management of burns could preserve the bridge of skin. If burn is circumferential without bridge of skin, then the bridge may be recreated by plastic surgical principles.

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