

Citric acid treatment of chronic non-healing ulcers in surgically excised cases of lateral malleolus bursitis

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ABSTRACT

Chronic, long-standing, non-healing ulcers in surgically excised cases of lateral malleolus bursitis are often refractory to conventional treatment. We report a simple and effective approach for their treatment by using local application of 3% citric acid ointment. We show three cases of chronic, non-healing ulcers in surgically excised cases of lateral malleolus bursitis that have not responded to conventional treatment modalities routinely used in developing countries. This is a prospective study which shows the potential efficacy of 3% citric acid ointment in chronic, long-standing, non-healing ulcers in cases of surgically excised lateral malleolus bursitis.

Keywords: non-healing ulcers, lateral malleolus bursitis, citric acid treatment.

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INTRODUCTION

Bursitis is an inflammation of the bursa. Repeated pressure over the lateral malleolar areas for long periods is one of the most important reasons for inflammation leading to chronic bursitis. Close proximity of the heel pad to the lateral malleolar area makes them more vulnerable and creates a limb-threatening situation, which may carry the risk of amputation. Surgical excision and split-skin grafting is the commonly used treatment in India for infected lateral malleolar bursitis¹. Surgical excision followed by antibiotic treatment and local wound care is the most commonly used treatment, especially in developing countries like India. Unfortunately, in the majority of the cases this treatment does not work effectively and results in a chronic wound.

The use of citric acid has been reported as an effective treatment for a variety of chronic wounds, which were not responding to conventional therapies²⁻⁶. Based on our earlier experience of treating patients of chronic wounds with citric acid effectively, a decision was taken to treat the cases by using 3% citric acid ointment. We report three cases of chronic, long-standing, non-healing ulcers in surgically excised cases of lateral malleolus bursitis that have not responded to surgical excision followed by antibiotic treatment and local wound care for years, which were treated successfully by application of 3% citric acid ointment locally.

METHODS

Three cases of chronic, long-standing, non-healing ulcers of surgically excised lateral malleolus bursitis referred to MIMSR Medical College and YCR Hospital, Latur, are included in the present study. After taking a detailed history and thorough clinical examination, a pus swab from each patient was collected and processed for culture and antibiotic-sensitivity testing. Simultaneously, the patients were advised application of 3% *citric acid ointment prepared by mechanical*

mixing of 3 g of pure citric acid with 100 g of white soft paraffin (100% pure petroleum jelly) in a mortar by taking all sterile precautions. With the consent of the patient, application of 3% citric acid ointment was started once daily. Before application, the wound was irrigated with normal saline and the wound was filled completely with 3% citric acid ointment. In this way, citric acid ointment was applied till the ulcer healed. The study protocol was approved by the institutional ethical committee.

CASE 1

A 57-year-old male with a history of type 2 diabetes mellitus was referred to our centre with chronic (two years) ulceration over the right lateral malleolus. The patient had a history of scratching the lateral malleolus area, which might have led to the reoccurring infection that resulted in swelling, pus and discharge over the past two years. No leg/calf oedema was observed. The patient received multiple treatments without relief for said complaints. Surgical excision of the bursa was scheduled. Incision and drainage under spinal anaesthesia were performed and the bursa was excised. The specimen sent for histopathological examination revealed infective bursitis so based on histopathological and clinical findings, a diagnosis of infective bursitis was made. Thereafter, the patient was treated with an injection of ceftriaxone (1 gm), amikacin (500 mg) and non-steroidal anti-inflammatory drugs (NSAIDs) twice a day for five days. The patient was treated with different groups of antibiotics with local

wound care by using conventional methods without use of total-contact casts, half-shoe or removable cast walkers (offloading) on several occasions without any signs of improvement (Figure 1).

Culture of pus swabs from the ulcer for aerobic bacteria revealed no growth after 24 hours of aerobic incubation. With the consent of the patient, we started topical application of 3% citric acid ointment, prepared using petroleum jelly as a base, once daily initially for 39 days and thereafter on alternate days for 22 days. A significant reduction in the size of ulcer was observed after 39 applications. The



Figure 1: Non-healing ulcer in surgically excised case of lateral malleolus bursitis — before application of citric acid ointment

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ulcer healed completely in 50 applications of 3% citric acid ointment over 61 days (Figure 2). No antibiotics were given during this course of management.



Figure 2: Non-healing ulcer in surgically excised case of lateral malleolus bursitis — after 50 applications of citric acid ointment

CASE 2

A 70-year-old male with a known case of hypertension with ischaemic heart disease presented with a left lateral malleolar non-healing ulcer without leg/calf oedema that had been present for 24 years. He had been operated on for an infected bursa 24 years before. The patient was treated with different groups of antibiotics along with local wound care using conventional methods on several occasions over the last 24 years. No compression or offloading was used. In spite of this treatment, no change in presentation of ulcer was observed.

The patient was referred to MIMSR Medical College and YCR Hospital, Latur, Maharashtra, India, for citric acid treatment. Patient swabs from the ulcer revealed growth of methicillin-resistant *Staphylococcus aureus* (MRSA), which was resistant to penicillin, cefoxitin, ciprofloxacin, gatifloxacin, levofloxacin, ofloxacin, co-trimoxazole, erythromycin, clindamycin, amikacin, gentamicin and tetracycline, and *Citrobacter* spp. resistant to ciprofloxacin, gatifloxacin, levofloxacin, ofloxacin, cefepime, ceftriaxone, gentamicin and amikacin, and sensitive to ceftazidime.

With the consent of the patient, topical application of 3% citric acid ointment, prepared using petroleum jelly as a base, without antibiotics was started daily for 28 days. This ulcer, infected with MRSA, the most difficult pathogen to eliminate from infection site, and *Citrobacter* spp. also showed significant reduction in the size of ulcer and formation of healthy granulation tissue after 15 applications. The ulcer healed completely in 28 applications of 3% citric acid ointment.

CASE 3

A 47-year-old male known diabetic (with uncontrolled blood sugar levels) of 20 years presented with left lateral malleolus bursitis without leg/calf oedema that had been present for two and half years. The infected bursa was thoroughly excised under regional anaesthesia. Thereafter, over the last two and half years the wound was treated with different groups of antibiotics in combination with local wound care using conventional methods on several occasions without offloading, without any signs of improvement.

Culture studies of swabs from the ulcer revealed growth of methicillin-resistant *Staphylococcus aureus* (MRSA) resistant to penicillin, cefoxitin, ciprofloxacin, gatifloxacin, levofloxacin, ofloxacin,

co-trimoxazole, erythromycin, clindamycin and moderately sensitive to amikacin, and sensitive to gentamicin and tetracycline.

Topical application of 3% citric acid ointment without any antibiotic cover was started daily for 30 days. The process of healing was observed with a significant reduction in the size of the ulcer and healthy granulation tissue formation after 20 applications, and the ulcer healed completely after 30 applications of 3% citric acid ointment.

DISCUSSION

Surgically excised cases of lateral malleolus bursitis can be refractory to conventional antibiotic therapy and local wound management. These cases are very much prone to develop into chronic, non-healing ulcers, which are more difficult to treat and hence remain unhealed for years.

In these case studies, an attempt has been made to treat chronic, long-standing, non-healing ulcers in surgically excised cases of lateral malleolus bursitis simply by local application of 3% citric acid ointment.

The use of 3% citric acid ointment has been reported previously in the effective treatment of a variety of chronic wounds in patients with underlying diseases such as diabetes, leprosy, burn, sarcoma and tuberculosis²⁻⁶. We found that the use of 3% citric acid ointment for chronic, long-standing, non-healing ulcers in surgically excised cases of lateral malleolus bursitis which did not respond to conventional treatment resulted in complete healing in all three cases. Healing occurred over 28 to 50 applications of 3% citric acid ointment without any antibiotic cover.

From these results, it appears that 3% citric acid ointment has the potential to aid the healing of chronic ulcers in patients with a variety of underlying diseases. This includes cases of chronic, non-healing ulcers in surgically excised cases of lateral malleolus bursitis, which are otherwise difficult to treat. These results also indicate that when healing of chronic, long-standing ulcers is a matter of great concern, the role of a topical agent like citric acid should be kept in mind as one of the alternatives.

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