

Citric Acid Treatment of Large Non-Healing Ulcer in a Patient with Chronic Liver Disease



Hartalkar Amol¹, Nagoba Basavraj¹, Wadher Bharat²

ABSTRACT

A case of 45-years-old male patient with a large non-healing ulcer over right leg is reported. Patient was a known case of chronic liver disease and was having multiple underlying problems. The ulcer was not responding to conventional treatment for more than one month. This non-healing ulcer was treated simply by local application of three percent citric acid ointment every day for a month, which led to complete healing of the ulcer without any complications.

Key words: Non-healing venous ulcer, chronic liver disease, citric acid treatment

Kronik Karaciğer Hastalığı olan bir Hastada İyileşmeyen Venöz Ülser Tedavisinde Sitrik Asit

ÖZET

Sağ bacağındaki iyileşmeyen venöz ülseri olan 45 yaşında erkek hasta bildirilmiştir. Hasta bir çok ek hastalığı ile birlikte kronik karaciğer hastalığına sahipti. Ülser bir aydan fazla süredir klasik tedvilere cevap vermiyordu. İyileşmeyen bu venöz ülser basit olarak %3'lük sitrik asit ile bir ay hergün uygulandı. Herhangi bir komplikasyon gözlenmeden yara iyileşti.

Anahtar kelimeler: iyileşmeyen venöz ülser, kronik karaciğer hastalığı, sitrik asit tedavisi

INTRODUCTION

Chronic wounds are significant medical and economical challenges (1) and continue to be a problem for clinicians because the orderly sequence of events is disturbed at one or more of the different stages of wound healing (2,3). The underlying problems in patients with large chronic wounds further complicate the healing. The underlying problems such as diabetes, anaemia, hypoproteinaemia, jaundice, etc. have been shown to increase the risk of wound infections and impair the process of wound healing (4-6). An ulcer is classified as non-healing when there has been no clinical improvement or closure of the wound after four weeks of treatment.

We report an interesting case of a large non-healing ulcer not responding to conventional treatment in a patient having chronic liver disease (with splenomegaly, anaemia, ascites and hypoproteinemia). The ulcer, which was

not healing for more than one month was treated simply by local application of three percent citric acid ointment every day for a month, which led to complete healing of the ulcer without any complications.

CASE

A 45-years-old male patient, who had chronic liver disease since four years, developed a non-healing ulcer over right leg. Patient had this ulcer over a period of one month which got infected because of negligence on his part. The ulcer was not responding to consistent conventional treatment for more than one month. He approached us when the ulcer had increased in size and badly infected. Patient was a chronic tobacco chewer but non-smoker and non-alcoholic. There was no history of trauma, varicose veins, calf pain, or a history suggestive

Department of Medicine and Microbiology, ¹MIMSR Medical College and YCR Hospital, Latur, and ²Department of Microbiology, Nagpur University, Nagpur

Received: 04.01.2011, Accepted: 04.02.2011

Correspondence: Dr. B. S. NAGOBA, Assistant Dean, Research & Development, MIMSR Medical College, Latur - 413 531 (M.S.) India
GSM: +91-09423075786
Fax : +9102382-227246
E-mail: dr_bsnagoba@yahoo.com, bsnagoba@indiatimes.com

of collagen vascular disease. The patient denied any arsenic exposure, irradiation or burns. He had no positive history of skin cancer. Physical examination revealed a single shallow irregular large almost rectangular shaped about 20x7 cm ulcer on the medial pretibial aspect of his right lower leg. The surface of the ulcer demonstrated shiny granulation tissue (Figure 1). There were mild eczematous changes of the surrounding skin. There was purulent foul smelling discharge from the wound with surrounding oedema. One could also observe skin hyperpigmentation, edema and coronal phlebectasia around ankles. Peripheral pulse was palpable. There was no inguinal or femoral lymphadenopathy. Examination of the abdominal system showed abdominal distension, splenomegaly, ascites. Cardiovascular system showed features of mild controlled congestive cardiac failure (CCF). Both dorsalis pedis and posterior tibial arterial pulsations were palpable on both sides. Neurological examination showed normal findings. His hemogram showed Hb:7.2gm%, total leucocyte count: 12,300/cmm, MCV: 71fl, MCH: 22pg, Platelets: 185,000/cmm, RDW: 72fl. Serum total protein: 5.4 gm, serum albumin:2.8 gm. Hepatitis B surface antigen test was positive. HIV 1 and 2 test was negative. Blood sugar, serum bilirubin, SGPT, SGOT, serum urea and creatinine and urine examination were all within normal limits. X-ray of right lower leg showed thickened medial pre-tibial skin without any infiltration or destruction of underlying tibia. Chest X-ray revealed no abnormal findings and abdomen sonography showed diffuse liver parenchymal disease, splenomegaly and ascites. Doppler duplex sonography revealed normal bilateral superficial femoral, saphenous and popliteal venous reflux of the right leg. Blood culture was sterile. Wound pus culture yielded Enterococci susceptible to tetracycline, ciprofloxacin, levofloxacin and gatifloxacin. The patient was admitted to the hospital and based on susceptibility report he was given ciprofloxacin 500 mg BD and local wound care with betadine for one week to clear wound sepsis, but in vain. Hence, a decision of application of three percent citric acid ointment was taken with the written informed consent of the patient. Three percent citric acid ointment, prepared by mechanical mixing of three gram citric acid using 100% pure petroleum jelly as a base, was applied to ulcer daily once. After application, the ulcer was dressed with cotton gauge. Oral iron therapy, diuretics and other supplementary treatment was initiated. No antibiotics were given during this course of treatment. Within three weeks, the ulcer decreased to one third of its original size and had completely healed, one week later (Figure 2). A total of 30 applications were needed for complete healing. No any adverse effects of citric acid were noted.

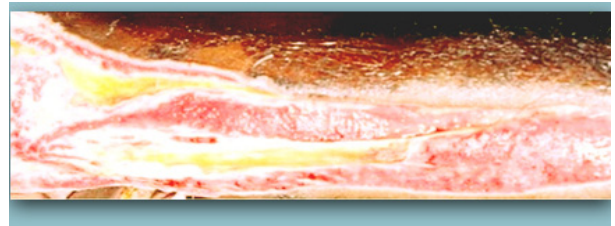


Figure 1. Non-healing ulcer-before application of citric acid ointment

DISCUSSION

The use of citric acid has been reported for the effective treatment of chronic wound infections not responding to conventional injectable or oral antibiotic therapy and local wound care management (7-10). Citric acid has been shown to have an antibacterial activity and controls the infection as indicated by microbiological studies and by rapid clearing up of infected surfaces. This antibacterial property may be due to the lowering of pH of the infected surfaces that makes an environment unsuitable for the growth and multiplication of the bacteria present at infection site. It has been shown to enhance epithelization, which is a major factor in wound healing, and found to actuate the wound healing process by boosting fibroblastic growth and neo-vascularization, which in turn increases microcirculation of wounds that enables the formation of healthy granulation tissue thereby leading to faster healing of wound (11). All of these actions increase the migration of epithelial cells from surrounding skin, and epithelization acts as a stimulus for laying the ground substance. In earlier reports, citric acid has been used effectively in the treatment of chronic wound infections in patients with individual underlying problems such as diabetes (7), leprosy (8), burns (9), etc. In the present case, citric acid was used for treating a large non-healing ulcer not responding to conventional treatment in a patient having chronic liver disease with splenomegaly, anaemia, ascites and hypoproteinemia. Interestingly, this large non-healing ulcer, not responding to regular conventional treatment for more than one month healed completely without any complications in 30 applications of citric acid ointment. These results indicate that when healing of a chronic wound/ulcer is a matter of great concern, especially in patients with multiple underlying problems, the value of topical agent such as citric acid should not be forgotten and it should be kept as one of the alternatives for the effective and affordable treatment of chronic wounds/ulcers, which fail to respond other treatment modalities.



Figure 2. Healed venous ulcer-after 30 applications of citric acid ointment

REFERENCES

1. Snyder RJ. Treatment of nonhealing ulcers with allografts. *Clin Dermatol* 2005;23:388-95.
2. Sibbald RG, Woo KY, Queen D. Wound bed preparation and oxygen balance—a new component? *Int Wound J* 2007; 4 Suppl:9-17.
3. Schultz GS, Sibbald RG, Falanga V, et al. Wound bed preparation: a systematic approach to wound management. *Wound Repair Regen* 2003; 11:51-28.
4. Carlson MA. Acute wound failure. *Surg Clin N Am* 1997; 77: 606-36.
5. Steed SL. Wound-healing trajectories. *Surg Clin N Am* 2003;83:547-55.
6. Williams JZ, Barbul A. Nutrition and Wound - healing. *Surg Clin N Am* 2003;83:571-96.
7. Nagoba BS, Gandhi RC, Wadher BJ, Rao Ak, et al. A simple and effective approach for the treatment of diabetic foot ulcers with different Wagner grades. *Int Wound J* 2010; 7:153-8.
8. Nagoba BS, Wadher BJ and Chandorkar AG. Citric acid treatment of non-healing ulcers in leprosy patients. *British J Dermatology* 2002;146:1101.
9. Nagoba BS, Gandhi RC, Hartalkar AR, Wadher BJ, Selkar SP. Simple, effective and affordable approach for the treatment of burns infections. *Burns* 2010; 36:1242-7.
10. Nagoba BS, Wadher BJ, Rao AK, et al. Simple and effective approach for the treatment of chronic wound infections caused by multiple antibiotic resistant *Escherichia coli*. *J Hosp Infect* 2008;69:177-80.
11. Nagoba BS, Gandhi RC, Wadher BJ, Potekar RM, Kolhe SM. Microbiological, histopathological and clinical changes in chronic wounds after citric acid treatment. *J Med Microbiol* 2008;57:681-2.