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Case report

# Citric acid treatment of post operative wound infections in HIV/AIDS patients

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Post operative wounds;
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**Abstract** The normal cellular immunity is required for normal wound healing. The HIV infection affects wound healing adversely. Wound infections in HIV/AIDS patients are difficult to manage because of compromised immunity. The result is delayed wound healing and increased susceptibility to wound infection. Here we report two cases of HIV positive patients who had developed the post operative wound gape, not responding to the conventional treatment, treated simply by local application of three percent citric acid ointment.


## Introduction

Impaired immune functions in HIV/AIDS patients increase the risk of perioperative infections, postoperative complications, impaired wound healing and associated with greater morbidity. Studies suggest that in these patients the risk of wound infection increases as the immune status deteriorates, hence these individuals have an increased incidence of a variety of bacterial infections, significantly greater incidence of wound complications and poor and delayed wound healing [1–3]. A significantly greater incidence of wound complications and wound breakdown in the HIV group following laparotomy than in the non-HIV control group was observed [4]. Surgical site infection (SSI) continues to be an important cause of morbidity and mortality in developing countries despite recent advances in antiretroviral therapy and aseptic techniques. The progressive failure of the immune system in patients with HIV/AIDS can increase the possibility of developing surgical site infections after surgery. Studies have shown that

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patients with pre-morbid illnesses, such as diabetes mellitus, HIV/AIDS, hemophilia, etc. are at higher risk of developing SSI due to their compromised immunity.

The incidence rate of SSIs in HIV-infected patients undergoing abdominal operation has been reported to be 37.9% [5]. However, an incidence rate of 30% was found in diabetic patients undergoing spinal surgeries [6]. In another study carried out in Tanzania, 22.8% patients with SSIs had pre-morbid illnesses namely diabetes mellitus (7.2%), hypertension (14.8%) and HIV (14.8%). The SSI rates for patients with pre-morbidity and those without were 70.2% and 38.4% respectively ($p$-value = 0.002) [7]. Morbidity and mortality increase significantly when the $CD_4^+$ T-lymphocyte count is less than 200 cells/μL. Studies suggest that in such patients the risk of wound infection increases as the immune status decreases [7–9]. The post-operative wounds are practically difficult to manage because of deterioration in immunity level as indicated by the fall in the T-helper (CD4) cell count.

The use of 3% citric acid ointment has been reported to give excellent results in the effective treatment of chronic wound infections in patients with various underlying diseases such as diabetes, burns, cancer, leprosy, etc. in earlier studies [10–13]. Based on these earlier findings, an attempt was made to use this simple and effective treatment modality for treating two cases of HIV positive patients who had developed the post operative wound gape and were not responding to the conventional treatment.

Here we report treatment of post operative wound gape in two cases of HIV positive patients by using local application of three percent citric acid ointment. The study protocol was approved by institutional ethical committee.

## Case 1

A 24-year-old female, presented as a primigravida with history of nine and half months amenorrhea (41weeks + 5 days gestational age) and pre-eclampsia with cephalopelvic disproportion (CPD). Emergency lower segment caesarean section (LSCS) was done for CPD. She had regular menstrual cycles in the past. She got married first in 2005, her husband died within six months due to cancer, record not available. She got remarried in 2009. There was no past history of hypertension, diabetes mellitus and tuberculosis. On general examination, her general condition was fair, she was afebrile, pulse rate 90 per minute and blood pressure 146/96 mm of Hg. Systemic examination showed normal respiratory and cardiovascular findings. Per abdominal examination showed full term uterus with fixed head and fetal heart sound was 140 per minute. Per vaginal examination showed cervix dilated by 3 cm (2 fingers loose), effacement 30–40%, membranes positive and pelvis borderline. On investigation, she was found to be HIV positive, confirmed by using three different screening tests. When first rapid test was positive on first sample, another sample was collected and processed by two other rapid tests. Both the blood samples were positive by three different rapid tests. The results of blood investigations were Hb-8.2 gm% and total leukocyte count – 13,000/$mm^3$ and platelet count – 3.54 lakhs. Urine routine examination showed albumin positive and sugar nil. In urine microscopy nothing abnormal was detected. Liver function tests and kidney function tests were within normal limit, random blood sugar level was 78 mg%, peripheral smear for malarial parasite was negative, hepatitis B surface antigen negative and her $CD_4$ count was 160/μL. The ultrasonography findings showed single live intrauterine fetus. Chest radiograph was normal and sputum for acid fast bacilli was negative. An emergency LSCS was done for CPD and preeclampsia. Post operatively she was given intravenous injections of cefotaxime 1 gm BID and injection metronidazole 400 mg TID for seven days. On post operative day 8, stitches were removed and a wound gape of about 5 cm was seen (Fig. 1). A specimen of pus was collected and sent for culture and susceptibility studies and capsule amplus (ampicillin 500 mg + clavulanic acid 1.25 mg) TID orally was started along with cefotaxime and metronidazole, and local wound care with hydrogen peroxide and betadine. This treatment was continued for five more days but in vain. The pus culture yielded *Escherichia coli* resistant to amikacin, levofloxacin, ciprofloxacin,

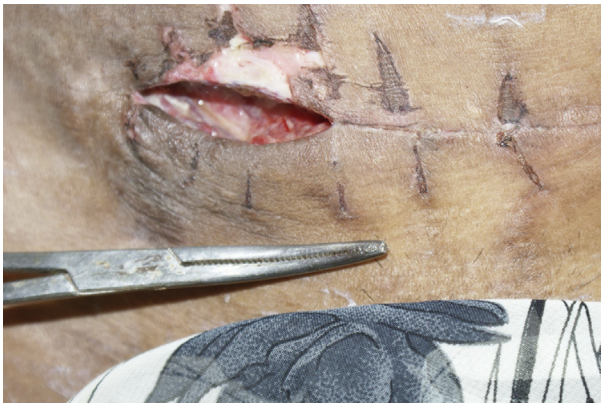

**Figure 1** Post operative wound gape in HIV positive patient – before application of citric acid ointment.