

# External fixation in HIV-positive patients with open fractures

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## Introduction

Open fractures may be complicated by sepsis and septic non-union. Septic complications markedly increase patient morbidity and treatment costs. Thorough debridement and external fixation to achieve bony stability is an accepted approach to management. Septic outcome in HIV positive patients has been recorded at over 50% [1]. We report the preliminary findings of a prospective study of consecutive cases of open fracture admitted to Queen Elizabeth Central Hospital.

## Materials and methods

Details from all adult patients with open fractures were entered on a case record form. Patients were counselled regarding testing for Human Immunodeficiency Virus (HIV), and those who consented were tested. Septic wound complications were assessed using the *Asepsis Wound Scoring System* [2]. Pin track sepsis of the external fixator pins was scored using the Checketts scoring system [3]. The severity of the open wounds was assessed by the system of Gustilo and Anderson in which a higher number represents a more severe wound and a greater risk of subsequent sepsis.

## Results

Nineteen patients were entered into the study, with 20 open fractures. Six of the 19 patients (32%) were HIV positive. Fractures involved 16 tibias, 3 forearms and 1 femur. Gustilo gradings were as follows: 1 patient was Gustilo grade 1; 8 patients were Gustilo grade 2; 7 patients were Gustilo grade 3a; 3 patients were Gustilo grade 3b.

Six patients suffered septic wounds. Two of 13 (15%) HIV negative patients had septic wounds compared to 4 of 6 (67%) HIV positive patients. The two HIV negative patients with sepsis both had Gustilo 3a fractures. In the HIV positive patients with wound sepsis, 1 was Gustilo grade 2, 1 was Gustilo 3a and 2 were Gustilo 3b.

The Checketts pin track scores are shown in the figure, where grade 0 is a healthy pin, and grade 1 is a pin with slight redness requiring increased cleaning. Pin sepsis requiring antibiotic therapy (Checketts grade 2) occurred in 24% of pins in the HIV positive patients, and 1% of pins in the HIV negative patients. No pin in either group required resiting on account of account of pin track sepsis (Checketts grade 3). CD4 counts were recorded in 5 of the 6 HIV positive patients. 2 patients had CD4 count greater than 500, of these, one healed and one had a septic wound. 3 patients had CD4 counts between 200 and 500; all 3 had wound sepsis.

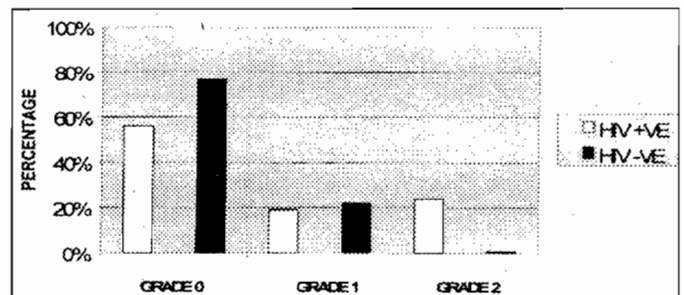
## Discussion

Patients with open fractures have a significant risk of deep

wound sepsis and subsequent morbidity. It may be expected that patients whose immune system is compromised by HIV infection bear an increased risk of wound sepsis following open fractures. There is some evidence that this is indeed the case [1,5]. It may also be expected that any increased risk of sepsis that exists may be proportional to the decline in patient immunity.

This prospective controlled study is the first known to the authors which has assessed both wound outcomes and immune status in terms of CD4 cell count. In the small numbers presented, HIV patients with open fractures fared badly. Of the 3 patients with CD4 cell counts below 500, all 3 suffered wound sepsis.

**Figure. Checketts pin track grading in relation to HIV status**



The optimal treatment of the immune compromised patient presenting with an open fracture is not yet known. The conventional treatment of wound debridement followed by external fixation relies on a satisfactory hold of the fixator pins in the bone. Sepsis of the pin track may weaken this hold even to the extent that external fixation must be abandoned. This is the first study known to the authors assessing the rate and severity of pin track sepsis in the immune compromised HIV patient. A marked increase in pin track problems was observed compared with controls, but clinical detriment was not seen in so much as the sepsis responded well to oral antibiotic therapy. External fixation of open fractures is a safe approach in regions with high HIV seroprevalence. Immune suppression from HIV infection should be considered in patients whose open wounds are complicated by sepsis. As yet it is not clear how HIV positive patients with septic open fractures will respond to further management.

## Acknowledgements

We acknowledge the assistance of Mr M Yesaya in collecting patient data; Sister Namalomba for taking blood samples; Mr R Fudzulani for undertaking laboratory analysis, and the Malaria Project for processing CD4 counts.

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References

1. Paiement GD, Hymes RA, Ladouceur MS et al. Postoperative infections in asymptomatic HIV-seropositive orthopaedic trauma patients. *J Trauma* 1994; 37, 545-551.
2. Wilson APR, Treasure T, Sturridge MF, Grunberg RN. A scoring method (Asepsis) for postoperative wound infections for use in clinical trials of antibiotic prophylaxis. *Lancet* 1986; 1, 311-312.
3. Checketts RG, Otterburn M, MacEachern G. Pin track infection: definition, incidence and prevention. *Int J Orthopaedic Trauma Suppl* 1993; 3(3), 16-18.
4. Gustilo RB, Anderson JT. Prevention of infection in the treatment of one thousand and twenty five open fractures of long bones. *J Bone Joint Surg* 1976; 58A: 453-458.
5. Jellis JE. Orthopaedic surgery and HIV-disease in Africa. *Int Orthopaedics* 1996; 20, 253-256.