

## Update on Peripherally Inserted Central Catheters in Patients with HIV in a tertiary hospital

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### Abstract

Literature on patients with HIV and Peripherally Inserted Central Catheter "PICC" published on MEDLINE database in English and Spanish have thoroughly been studied, revised and updated. We reviewed the medical records of all Human Immunodeficiency Virus (HIV) infected patients with Peripherally Inserted Central Catheter "PICC" implanted from 2010 to 2016.

In view of changes over the past in the intravenous management of patients with AIDS and infectious disease, we performed at Policlinico Gemelli Hospital a retrospective study of the last six years, in which we had reviewed all HIV infected patients with PICCs. Retrospectively we have evaluated the clinical severity of patients enrolled using Charlson-Deyo comorbidity score.

Our hospital has 1500 beds. There are two departments of infectious diseases for a total of 40 beds. There is an outpatient service where HIV patients are followed and a Day Hospital where chemotherapy is administered.

All HIV- infected patients who had PICC were identified about the occurrence of one of the following events: catheter related complication, catheter requiring removal in all cases, or death. All statistical procedures were performed using the SPSS software package (SPSS Inc. Version 15.0, Chicago).

### Introduction

Ninety two PICCs were inserted in eighty seven patients during the last six years. The indication of placement of PICCs for 40.2% of patients was intravenous antibiotic therapy, 9.2% of patients for chemotherapy because of Hodgkin Lymphoma, 20.7% for Non-Lymphoma Hodgkin's large cell b, 6.9% for Cytomegalovirus-disseminated infection, 17.2% for other cancers, the 4.6% for Burkitt's lymphoma, the 1.1% for Kaposi's sarcoma.

PICCs were inserted by use of standard techniques: ECG and X-Ray techniques. ECG technique was not carried out in 19.5% of patients (patients who have implanted until 2014), for the other patients (80.5%) ECG technique was used. In our study it is clear how the technique of implantation of the PICC has changed during these years: from 2014 the use of technologies such as ultrasound and electrocardiographic (ECG) guidance systems to place peripherally inserted central catheters (PICCs) has grown; before 2014 instead it was used X-ray. Among the methods to assess the correct positioning of the tip of central venous catheters, the ECG method is safe and reliable [1].

### Discussion

Pubmed literature shows that PICCs were associated with a low infection rate and a moderate mechanical complication rate [2,3]. In our study five of eighty seven patients had a PICCs related complication.

We have defined serious infection as: (1) catheter- related bacteremia-isolation of an organism known to cause catheter-related infections from at least 1 blood culture (or 2 positive blood cultures if the isolate was coagulase-negative *Staphylococci*) and (2) tunnel infection-tenderness, erythema and/or induration along subcutaneous catheter tract, associated with fever and bacteremia and non-serious infection: (1) exit-site infection-erythema, tenderness, with induration and/or purulence at skin exit site of catheter.

Noninfectious complication: (1) clotted/thrombosis catheter-unable to aspirate or inject *via* catheter-injection port; (2) leaking or fractured catheter-leaking of catheter due to catheter fracture; (3) catheter migration-catheter fell out or migrated substantially thus requiring removal; and (4) catheter-related phlebitis, local inflammation at the catheter site with a palpable superficial venous cord or induration and serious complication: complication resulting in hospitalization and/or the administration of *iv* antibiotics [4,3].

The incidence of catheter complications was expressed per 1000 catheter-days. Each catheter was analyzed individually. Among the patients enrolled there are: Three patients with non-serious infection complication, one with thrombosis catheter-unable to aspirate or inject and the two patients because of catheter migration-catheter fell out or migrated requiring removal.

Human immunodeficiency virus (HIV) patients are at risk of developing thrombosis than general population. There are several intersecting mechanisms associated with HIV infection and antiviral therapy that are emerging, which may lead to vasculopathy and hypercoagulability in these patients.

Two patients had serious infection complications: the first one with catheter related bacteremia-isolation of an organism known to cause catheter related infection from at least 1 blood culture (*Candida parapsilosis*) and the second one with two positive blood culture with coagulase negative *Staphylococci* (*Staphylococcus epidermidis*).

In our study thirty-two patients are between the ages of fifty and sixty years, twenty-seven patients in the age group of forty to fifty years; sixty-three male and twenty-four female.

Forty-eight patients had a Charlson-Deyo comorbidity score between 10 and 14 points, sixteen patients a score >14 and 23 patients <10. The 71.3% of patients died.

Among the patients enrolled there are: the 72.4% of patients belongs to the CDC HIV C3 group; CD4 cell counts were <200 for thirty-two patients, and 69.6% of patients had undetectable viremia; the 20.7% of patients were off therapy and 69% of patients were treated with antiretroviral therapy (Table 1).

Group	N° patients	%
A1	0	0
A2	2	2.30%
A3	1	1.15%
B1	0	0
B2	9	10.34%
B3	8	9.20%
C1	0	0.00%
C2	4	4.60%
C3	63	72.41%
HIV-RNA<50 cp/ml	64	73.56%
HIV-RNA ≥ 50 cp/ml	23	26.44%
CharlsonScore ≤ 10	31	35.63%
10 <CharlsonScore<14	26	29.89%
CharlsonScore ≥ 14	30	34.48%

**Table 1:** Characteristics of patients enrolled in our study

## Conclusion

This study shows that in the last years the risk of patients with Human Immunodeficiency Virus is not the adherence to antiretroviral therapy but the majority of patients with HIV must undergo chemotherapy [5].

PICCs were associated with a low infection rate and a moderate mechanical complication rate, which compare favorably with historical rates seen in AIDS patients with other types of central venous access devices. PICCs are a reasonable alternative to other central venous access devices in patients with HIV or AIDS [4,6].

The use of peripherally inserted central catheter (PICC), with a very low percentage of mechanical and infectious complications, has improved the life expectancy of patients with HIV [7,8].

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