

Use of an Antimicrobial and Anti-thrombogenic PICC – A Prospective, Multicenter, Observational Study

Introduction: This study evaluated an antimicrobial and antithrombogenic peripherally inserted central catheter (PICC) and the incidence of complications associated with its use within both inpatient and outpatient populations.

Methods: This IRB-approved, multicenter, prospective observational study was performed at three large US academic hospitals. Adults who required PICC ≥ 14 days were considered. Patients were monitored throughout entire catheter dwell, to a maximum of 90 days. Data was collected from hospital, outpatient and patient PICC records. Duplex venous ultrasounds were performed before insertion, after 10 to 14 days of dwell time, and upon removal.

Results: 103 patients, 56% male, with mean BMI 29 ± 8.8 , were enrolled. The majority (79%) of patients were from high-risk groups – cancer, infectious diseases, transplant, and trauma. Primary indications were antibiotics (66.99%) and chemotherapy (25.24%). Double lumen PICCs (59.2%) were favored clinically, as was basilic vein placement (71.84%). Mean catheter dwell was 47.01 ± 25.82 days. Three (3) catheter-related bloodstream infections (CRBSIs) were reported. Five patients reported symptomatic catheter-related thrombosis (CRT), subsequently confirmed with ultrasound (1.62/1000 days). Several patients with asymptomatic CRT after 10 to 14 days of dwell time demonstrated complete resolution of thrombus at the time of catheter removal, confirmed by ultrasound. The incidence of catheter-related bloodstream infection (CRBSI) was 0.82/1000 days, compared to currently reported rates of 1.8–7.7/1000 days, providing a 2.2–9.39-fold reduction. The overall symptomatic CRT rate was 1.62/1000 days, a 1.67–2.65-fold reduction compared to reported symptomatic CRT rates of 2.7–4.3/1000 days.

Conclusion: Antimicrobial and anti-thrombogenic PICCs should be considered for use in patient populations who are at moderate to high-risk for CRBSI and CRT in both inpatient and outpatient clinical settings.

Gender	
Female	44
Male	59
Race	
White	78
Black	17
Other	8
BMI	29 ± 8.8
PICC Indications	
Antibiotics	69
Chemotherapy	26
Others	8
History of VTE	
Pulmonary Embolism	3
Venous Thromboses	9
None	115
Discharge Type	
Home Health	48
Outpatient	21
Family/Other	34
Insertion Site	
Basilic	74
Brachial	24
Cephalic	5
Laterality	
Left	30
Right	73
Vein Size	6.2 ± 7.9 mm
PICC Characteristics	
4.5Fr	41
5.5Fr	61
Unknown	1

Table 1: Baseline demographics and characteristics of enrolled participants.

Patients	# Doses	Catheter Site	Days of Thrombolytic Intervention	Indication for Thrombolytic Agent
4	1	Right	39, 35, 35, 63	Inability to withdrawal
1	5	Right	37	Inability to withdrawal

Table 2: Frequency and Use of Thrombolytic Agent.

Event Day	Sex	BMI	Indication	Insertion Site	PICC Size	Treatment
14	Female	26.4	Chemotherapy	R) Basilic	5.5Fr.	Multiple antibiotics
27	Male	29.2	Antibiotics	L) Basilic	5.5Fr.	Cefepime
60	Female	24.1	Chemotherapy	L) Basilic	5.5Fr.	Vancomycin Cefepime

Table 3: Clinical characteristics of patients with CRBSI.