

## Original Research Article

## A Prospective Study on Peripherally Inserted Central Venous catheter Associated Deep Venous Thrombosis in Patients with Burns

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**Abstract:** Central venous catheterization may cause the thrombosis in patients. The present study conducted to evaluate the peripherally inserted central venous catheter associated deep venous thrombosis in burns patients. Total 130 patients were included in this study. These patients had three different types of burns. Patients were selected based on inclusion and exclusion criteria. All the patients' demographic data and clinical data were collected. The data was analysed by Chi-square test and p value less than 0.05 considered statistically significant. Males were more compared to females. The mean age of study population is 31.92 years. 31.32 is the mean burns percentage of study population. More had right femoral artery PICC. 12.8 days is mean line indwelling time in study population? Only 6 patients were developed PRLVT. The study results concluded that PRLVT is not uncommon in patients with different types of burns. Further studies are required for better evaluation of relationship between PRLVT in the burns patients.

**Keywords:** Burns, catheterization, artery, femoral vein, embolism, thrombosis

**INTRODUCTION**

Peripherally Inserted central Venous Catheters (PICCs) are being increasingly utilized in hospitalized patients as alternatives to Centrally Inserted Central Venous Catheters (CICVCs) [1, 2]. Though major mechanical complications of placement are avoided, cumulative complication rates may not be decreased with PICCs compared to CICVCs as concern exists over the risk of PICC-related large vein thrombosis (PRLVT) [3-5]. Recent trials of hospitalized patients have defined PRLVT as thrombosis affecting the deep veins or the large superficial veins. Rates of PRLVT are documented between 3 and 58%. The highest rates of PRLVT are reported from patient populations who have required PICC placement in the intensive care unit (ICU) [6]. The rate of large vein thrombosis related to CICVCs is reported to be much lower, in the range of 0-10% in ICU patients, after excluding the femoral site. More data exist on spontaneous upper extremity deep venous thrombosis (UEDVT) which is frequently reported to be symptomatic, including the risk of pulmonary embolus. Patients with thermal injury have

multiple, well recognized risk factors to develop venous thromboembolism (VTE). These risks include increased total body surface area (TBSA) burned, increased length of intensive care unit (ICU) stay, central venous access, increased age, obesity, burn wound infection, and transfusion over 4 units of packed red blood cells. This study aims to evaluate the incidence and significance of PRLVT in burns patients.

**MATERIALS AND METHODS****Study settings and period:**

This was a prospective descriptive study conducted at a tertiary care burns centre in Bangalore. All the patients who were admitted in burns ward and underwent femoral vein PICC insertion between July 2016 and December 2016 were included in the study

**Inclusion criteria**

- Above 14 years
- Type of burns thermal, chemical or electrical

**Exclusion criteria**

- Less than 14 years
- Previous history of coagulopathies or deep venous thrombosis (DVT)
- DVT in both lower limbs

**PROCEDURE**

Patients in whom peripheral venous line was not easily accessible or insufficient to maintain fluid homeostasis were inserted with a femoral vein PICC in either of the limbs. Among these patients, those who developed clinical signs and symptoms of DVT were screened using Duplex scan. The following patient data were recorded: age, sex, type of burns, percentage of burns, and side of limb used for femoral vein PICC, number of days PICC was kept in situ, number of days of admission, number of patients who developed deep venous thrombosis in the same limb as PICC. Incidence rate of PRLVT were calculated. All patient at our institution receive chemical thrombo-prophylaxis in the form of weight adjusted low molecular weight heparin 5000IU subcutaneously twice a day for 7 days, and warfarin as per our institution thromboembolism guidelines and mechanical prophylaxis like, early mobilization, graduated compression stockings, and

intermittent external pneumatic calf compression device application [7].

**Statistical Analysis**

Descriptive statistics were performed; t-tests for age and categorical variables were assessed by Chi-square test or Fishers exact test as appropriate. The p value of less than 0.05 was considered to be statistically significant.

**RESULTS**

A total of 130 patients with burns who were inserted with a femoral vein PICC were included in the study. The mean age was 31.92 years (16-65years). Males (74) more compared to females (56). In the study 110 patients had thermal burns, 17 had electrical and 3 had chemical burns. The mean percentage of burns was 31.32 (13-45%). Maximum number of patients had right femoral vein PICC (90) and 40 had left femoral vein PICC. The mean line indwelling time was 12.8 days and duration at which DVT was diagnosed was 11days. Out of 130 patients who had femoral vein PICC, 6 patients developed PRLVT (incidence rate = 4.61%). There was no significant difference in gender in relation to development of a thrombosis. Although left sided DVTs were more, location of catheter was not quite significant (Table-1 and Graph-1).

**Table-1: Demographic and clinical data of the patients**

<b>Data</b>	<b>Number</b>	<b>Percentage (%)</b>
<b>Mean age</b>	31.92 years	
<b>Male</b>	74	56.9
<b>Female</b>	56	43.1
<b>Male: Female ratio</b>	1.32	
<b>Thermal burns</b>	110	84.6
<b>Electrical burns</b>	17	13
<b>Chemical burns</b>	3	2.3
<b>Mean percentage of burns</b>	31.32	
<b>Mean PICC indwelling time</b>	12.8 days	
<b>Total number of PRLVT</b>	6	<b>p=0.3978</b>
<b>Male</b>	2	
<b>Female</b>	4	
<b>Right lower limb</b>	2	<b>p=0.0731</b>
<b>Left lower limb</b>	4	
<b>Incidence of PRLVT</b>	4.61	

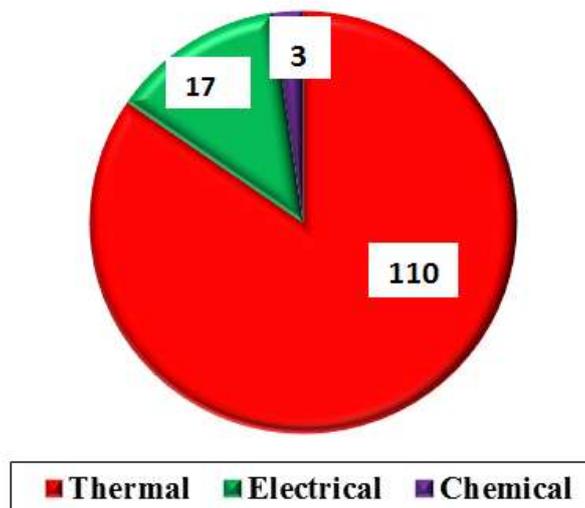


Fig 1: Number of mechanism of burns

## DISCUSSION

In this study total 130 patients were included with three different types of burns. The incidence rate of symptomatic PRLVT in our study was 4.61%. Burns patients are prone to develop DVT [8]. This limitation makes the rate of symptomatic PRLVT in the burns difficult to determine, however, it is likely higher in burns patients than in patients hospitalized for other diseases. Compared to CICVCs, PICC lines are associated with less insertion –related complications and are easier to manage. However, our data do not necessarily suggest they are easier to place or that they are less painful than CICVCs. Further research should focus on indentifying modifiable risk factors for PRLVT and on comparing major complication rates between PICC lines and CICVCs exclusively in burns patients.

## CONCLUSION

PRLVT is not uncommon in patients with burns. Further research is required to indentify modifiable risk factors for PRLVT and to compare major cumulative complication rates between PICCs and CICVCs in burns patients. Conclusions regarding the risks versus benefits of PICC lines compared to CICVC lines in burns can be made after completion of a prospective randomized trial comparing PICCs to CICVCs.

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