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COMPLICATION PROFILE OF PERIPHERALLY INSERTED CENTRAL CATHETERS IN ONCOLOGICAL SETTING, SINGLE CENTRE EXPERIENCE IN NORTH INDIA.

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ABSTRACT

In hemato-oncological setting, long term drug delivery route is very much needed. Peripherally inserted central catheters (PICC) are used for this purpose. There is no study reported from Jammu and Kashmir. This was a prospective observational study over a period of one year in the department of Medical Oncology at Khyber super speciality hospital Srinagar in north India. The data was collected with respect to gender, disease, catheter dwell time and complications.

AIM: To study the complications associated with PICC insertion and ease of administration.

Methods: All patients who needed chemotherapy or supportive care for more than 4 months as per standard chemotherapy protocols were included and where chemotherapy protocols were just bolus doses and shorter than four months were excluded. After all antiseptic precautions, PICC were inserted either USG guided or unguided depends upon visualization of upper arm veins. USG was used to guide cannula of PICC and rest procedure was totally blind. Position of PICC was confirmed with two techniques, and the length was adjusted at angle of Louis with the use of guide wire. Ten millilitre of normal saline flush was used and patient was asked to report any hissing sound or cold sensation from ipsilateral ear, which was 100% confirmatory on x-ray chest done later on whether PICC line tip lied in sub-clavian or jugular vein. PICC line was then fixed with stat lock. The complications associated with procedure and long term problems were noted down.

Results: Out of 200 patients enrolled males were 120, 90% were inserted unguided. Most common disease was carcinoma stomach (35%) and dominant arm was used in 15%. Unguided procedures were done in 2 minutes with average blood loss of 2ml. Around 5% reported pain within 24 hours and 2.5% reported fever beyond 24 hours. Average dwell time for single PICC was 5 months and 35% developed line fracture which was correctable. Only 3% developed serious complications viz; CABSI (Catheter associated blood stream infections) in 2.5% and thrombosis in 0.5%.

Keywords: PICC-peripherally inserted central catheter, USG—ultrasonography, CABSI- catheter associated blood stream infection, CVC- central venous catheter.

Introduction

Prolonged treatment and frequent administration of chemotherapeutic drugs, blood and blood products with supportive care is the cornerstone of cancer patient care. For this purpose, central venous access devices (CVAD) such as chemoport (CP) and peripherally inserted central catheters (PICC) are being used. Central venous catheters (CVC) were introduced in 1980s, since then they are in use [1]. The cost of device and maintenance is crucial factor especially in low income countries. Our study was based on patient satisfaction, cost, maintenance of line and complications involved with this over a period of one year.

Observations:

This prospective study was done at a super speciality hospital in north India, where department of Oncology is functional since 2014. We took 200 patients for this study, where chemotherapy was to be given for longer periods, beyond four months. Only one type of PICC, Bard 4F Groshong, was used in all patients. PICC was put in upper arm either under USG guidance or without guidance. USG guidance for localisation of vein was done in whom peripheral veins were not easily seen.

Males out number females with male to female ratio 1.5:1. USG guidance was used in 10% patients and rest were unguided (Fig1). The disease profile of patients in study is depicted in fig. 2. Most patients were carcinoma Stomach followed by Carcinoma Colon. Mostly non-dominant side

(85%) was used for PICC and only in 15% dominant side was used.

These lines were used for different purposes, whether for prolonged chemotherapy, parenteral nutrition and patients who could not took enough nutrition either due to high gut obstruction or cancer cachexia, or was used for delivering fluids and antibiotics in infections (Fig.3).

Average time for procedure varied between guided and unguided. It was 2 min in unguided and 10 min in USG guided. USG guided procedure were done only in patients where unguided was not possible.

All PICC were put after cleaning local area and after giving 0.5ml 2% lignocaine. Around 90% of guided PICC insertions perceived some degree of pain (Fig.4). Procedure related blood loss occurred more in USG guided PICC insertion (Table 1).

Table 1:

Type of PICC line insertion	Maximum blood loss	Minimum blood loss	Average blood loss
UN guided	6ml	nil	2ml
USG guided	30ml	5 ml	10 ml

Post procedure 24 hour complications were either pain or thrombophlebitis. Local site pain was reported by 5% patients and thrombophlebitis in 7.5%. Pain was controlled with paracetamol and thrombophlebitis with topical heparin cream. No patient reported fever within 24 hours. Only 2.5% patients reported fever after 24 hours within one week, which was uncomplicated and responded to Amoxy clav and paracetamol.

Most PICC were removed at the end of full course of chemotherapy or till enteral feeding was possible in high gut obstruction patients. Average dwell time for single PICC was 5months, with range of 18 days till 12 months. PICC got fractured in chronic users beyond 4 months of dwell time in 35%, but all lines were made functional after readjustment. Total of two heparin saline of 10 ml flushes were used in a month to maintain patency.

Delayed complications (beyond 4 months) occurred in few patients, which needed premature removal (fig 5). Catheter associated infections were treated with antibiotics as per sensitivity and PICC removal (Fig 6), while as thrombosis of vein received long term low molecular weight heparin, which got opened after complete treatment. We report no hemo-thorax or pneumothorax and arrhythmias (Fig.7).

Over all our experience with Bard Groshong PICC lines with one way valve at the proximal end has been excellent and could very well substitute the chemo Port implant which is invasive and cumbersome and costly affair.

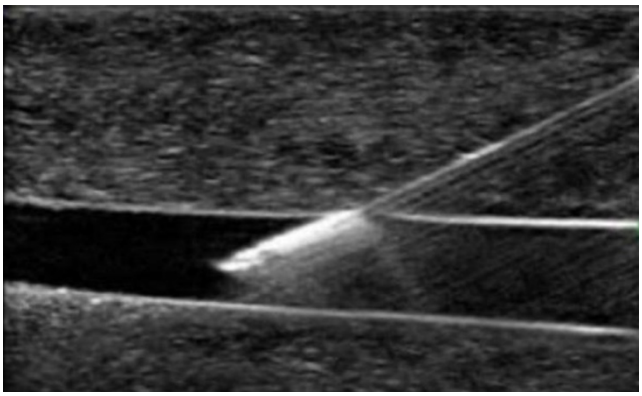

Figure 1: USG guided cannulation in a vein

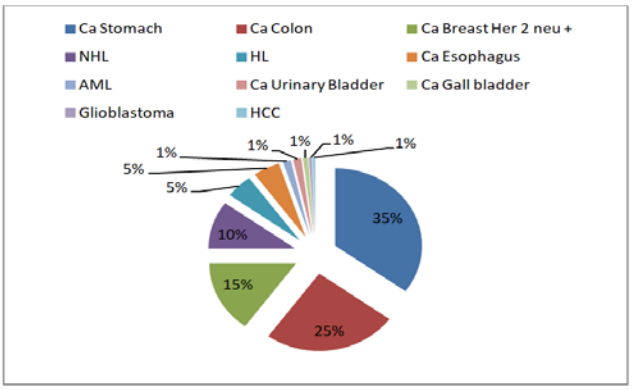

Figure 2: Profile of patients

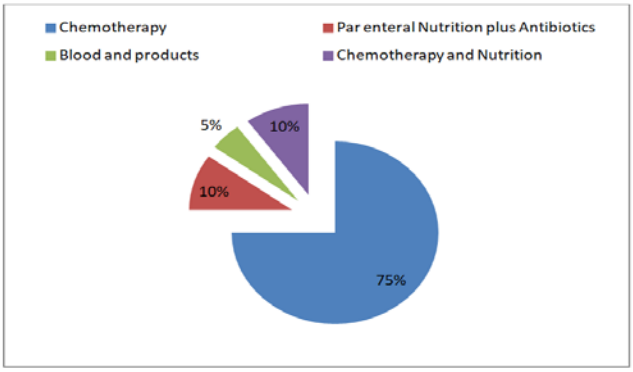

Figure 3: PICC line usage

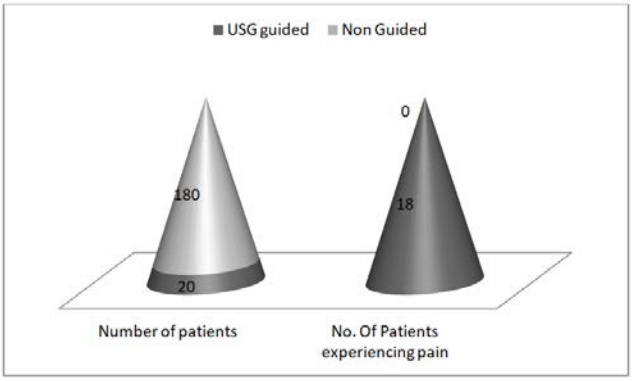

Figure 4: Procedure and any grade pain perception

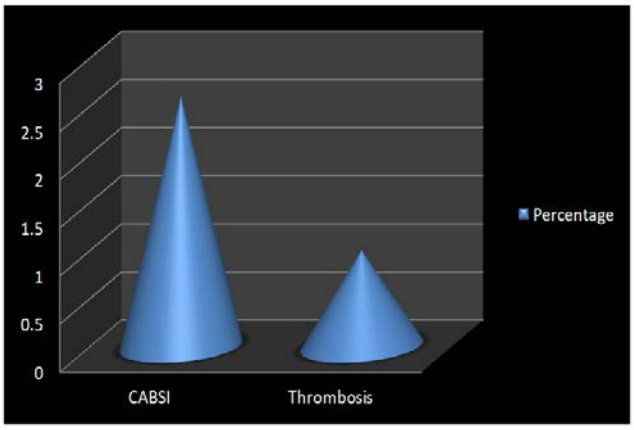

Figure 5: Long term complications

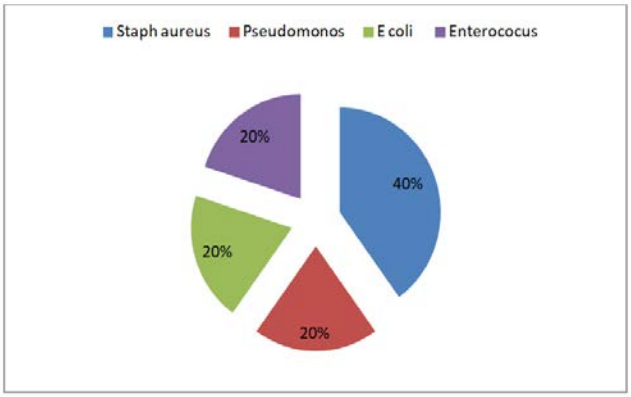

Figure 6: Organisms recovered

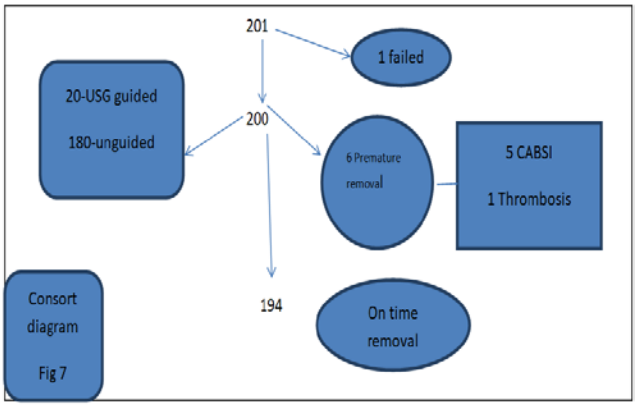

Figure 7: Consort diagram

Discussion:

CVC is time tested and type of CVC insertion depends on its usage. Gowardman et al. and Norwood et al. showed us which site has lowest colonisation [2-3]. The choice of catheter is also influenced by patient preference [4]. In a study by Jain et al. median PICC dwell was 59 days where as in ours we had 150 days. We inserted Bard Groshong PICC lines in 200 patients and failed in one. Difficulty in insertion was noted in 1% patient against 5% cases of Certofix and 12.5% cases of Cavafix by Kumar et al.[5]. Extravasation was noted in 3.89%, DVT in 2.78% and thrombophlebitis in 1.11% cases in K.G Babu et al, where as we reported no extravasation, 7.5% thrombophlebitis and 0.5% thrombosis. Our PICC was valved against other PICC like Cavafix, Certofix where withdrawal is possible and allowed, where at least once daily flushing is needed. We did not witness any catheter fragment dislodgement contrary to K.G Babu et al. study and others [6].

The rates of CABSI ranged from 7% to 60% in different studies [7-8] and in K.G Babu et al., 25% where as in our study it was 2% only. Organisms recovered were gram positive in 60%, which is same as in study reported by Kumar et al. premature removal of PICC was done in 2.5% in our study due to complications whereas it was 27.3% in K.G Babu et al study. So PICC served the purpose in almost all our patients.

Conclusion:

PICC are very important part in cancer patient management. We reported first kind of this study from our region with almost no complication rate and very low investment on procuring, introduction and maintenance as compared to Port implants. Bard Groshong 4F lines sub served the role as compared Cavafix.

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