XI Congresso GAVeCeLT – 11th Congress

Verona 2-3 dicembre – 2nd - 3 rd December 2019

Martedi 3 dic 2019 h 16.30-18.00 : IL PAZIENTE ONCOLOGICO / ONCOLOGY

Vantaggi di un algoritmo di scelta del dispositivo venoso nel paziente oncologico, in termini di riduzione delle complicanze e risparmio di risorse.

Something we all need: an appropriate algorithm for choosing the safest and most cost-effective venous access device in the patient candidate to chemotherapy.

Roberto Biffi, MD, PhD, FSPS
Dept. of G-I Surgery
Director, Peritoneal Cancer Surgery Unit
and Ovarian Cancer Center
European Istitute of Oncology – Milano, Italy
Adjunct Professor of General Surgery, University of Milan

Co-Director ESAGON
European **S**chool of **A**bdomino-pelvic Surgery in **G**ynecologic **On**cology

European Istitute of Oncology - Milano

«Riduzione delle complicanze e risparmio di risorse»

Costs are an additional critical issue in clinical decision making, aiding healthcare personnel in the selection process of the VADs and their technique of implantation.

Ann Surg Oncol. 2014 Nov;21(12):3725-31. doi: 10.1245/s10434-014-3784-5. Epub 2014 May 20.

Cost effectiveness of different central venous approaches for port placement and use in adult oncology patients: evidence from a randomized three-arm trial.

Biffi R[1], Pozzi S, Bonomo G, Della Vigna P, Monfardini L, Radice D, Rotmensz N, Zampino MG, Fazio N, Orsi F.

Author information

1

Division of Abdomino-Pelvic and Minimally Invasive Surgery, European Institute of Oncology, Milan, Italy, roberto.biffi@ieo.it.

Abstract

BACKGROUND:

No randomized trials have so far investigated the cost effectiveness of different methods for implantation and use of central venous ports in oncology patients.

PATIENTS AND METHODS:

Overall, 403 patients eligible for receiving intravenous chemotherapy for solid tumours were randomly assigned to implantation of a single type of port, either through a percutaneous landmark access to the internal jugular vein, an ultrasound (US)-guided access to the subclavian vein, or a surgical cut-down access through the cephalic vein at the deltoid-pectoralis groove. Insertion and maintenance costs were estimated by obtaining the charges for an average implant and use, while the costs of the management of complications were analytically assessed. The total cost was defined as the purchase cost plus the insertion cost plus the maintenance cost plus the cost of treatment of the complications, if any.

RESULTS:

A total of 401 patients were evaluable-132 with the internal jugular vein, 136 with the subclavian vein and 133 with the cephalic vein access. No differences were found for the rate of early complications. The US-guided subclavian insertion site had significantly lower failures. Infections occurred in 1, 3, and 3 patients (internal jugular, subclavian, and cephalic access, respectively; p = 0.464), whereas venous thrombosis was observed in 15, 8, and 11 patients, respectively (p = 0.272). Mean cost for purchase, implantation, diagnosis and treatment of complications in each patient was <euro>2,167.85 for subclavian US-guided, <euro>2,335.87 for cephalic, and <euro>2,384.10 for internal jugular access, respectively (p = 0.0001).

CONCLUSION:

US real-time guidance to the subclavian vein resulted in the most cost-effective method of central venous port placement and use

Table 3

Cost of purchase and implanting a totally implantable access port in the present series (€)

Parameter	Internal jugular	Subclavian	Cephalic
Device	287.00	287.00	287.00
Supplies (fluoroscopy, local anesthesia, monitoring, operating room costs (including medical and nursing staff)	1,460.00	1,368.00	1,481.00
US device and personnel training	NA	32	NA
Laboratory tests	45.00	45.00	45.00
Total	1,792.00	1,732.00	1,813.00

US ultrasound, *NA* not applicable

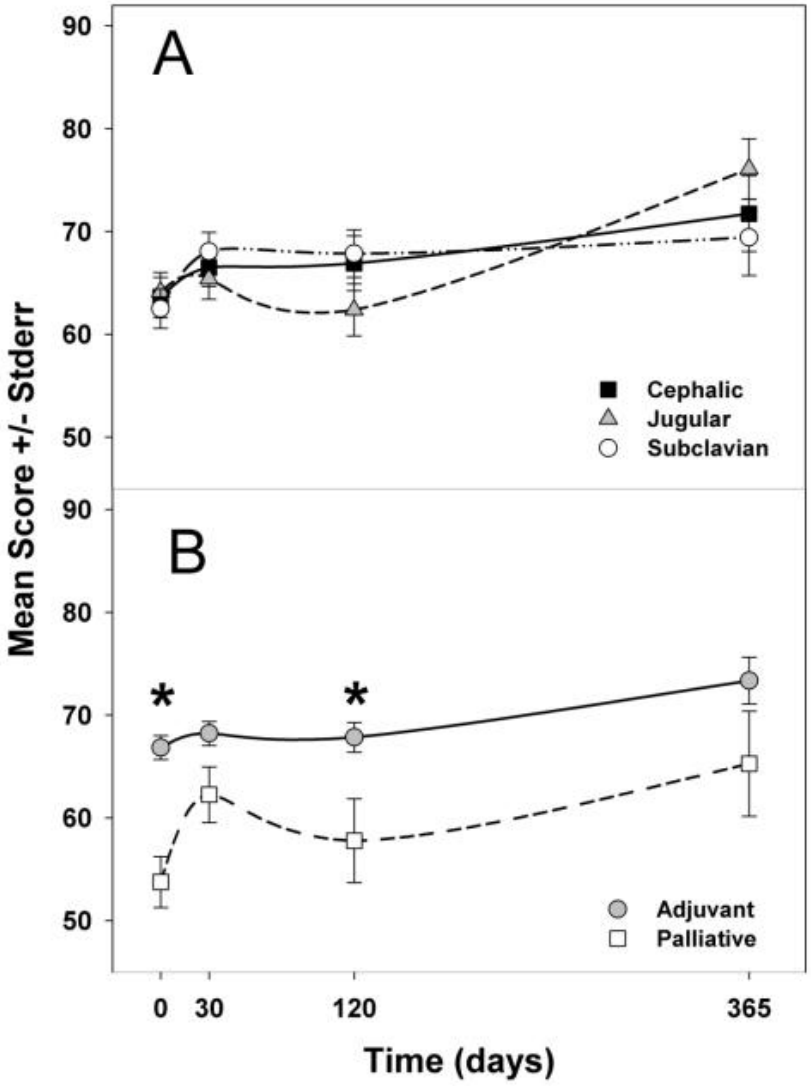
Table 5
Global cost of purchase, implantation and maintenance of a totally implantable access port in this series (€) .

	Internal jugular	Subclavian	Cephalic
Cost of single-port purchase and implantation	1,792.00	1,732.00	1,813.00
Number of implanted ports, as per intent-to-treat	133	136	134
Global cost of purchase and implantation of devices	238,366.00	235,552.00	242,942.00
Cost of treatment of early complications	–	–	665.00
Cost of treatment of late complications	47,066.00	27,622.00	37,756.00
Global cost of diagnosis and treatment of complications	47,066.00	27,622.00	38,411.00
Global cost of purchase, implantation, and treatment of complications of devices	285,432.00	263,174.00	281,353.00
Device maintenance cost (6 months)	31,654.00	31,654.00	31,654.00
Global cost for each patient treated	2,384.10	2,167.85	2,335.87

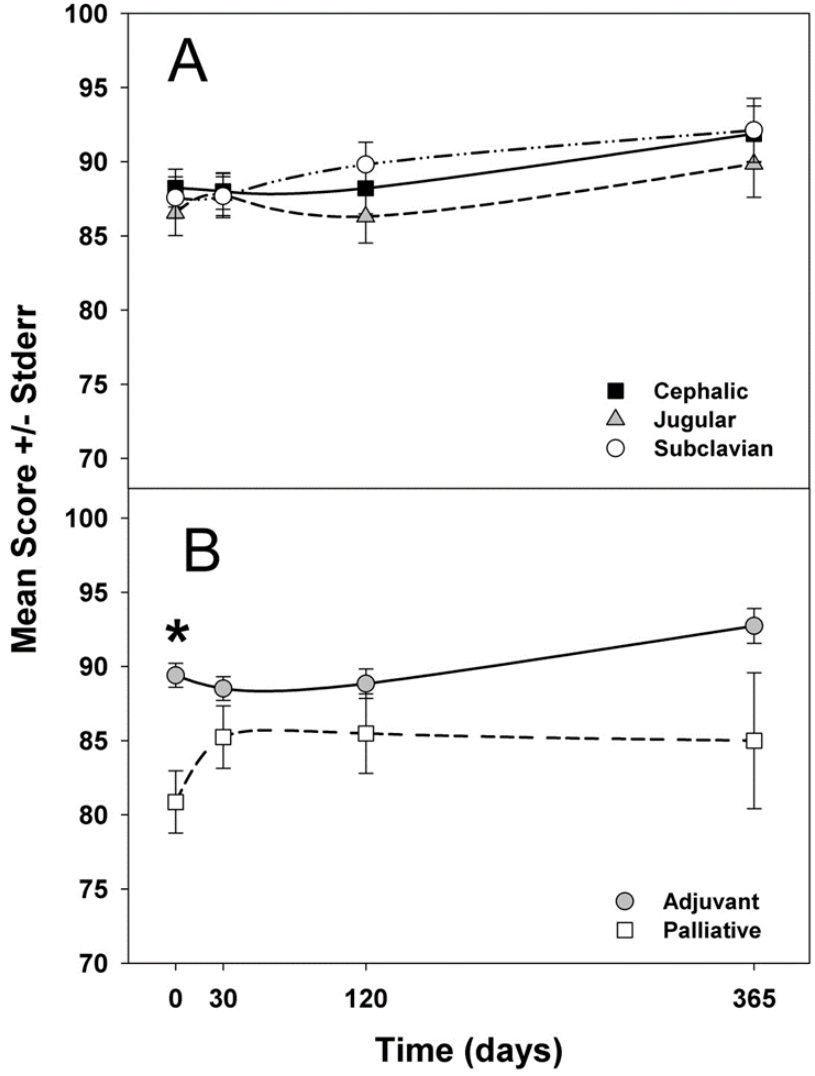
R Biffi et al,
Ann Surg Oncol 2014

A limitation of our study basically deals with the reference of the obtained data to the European Institute of Oncology in Milan, Italy.

As a consequence, global costs we detected might not completely reflect national, provincial, or other price agreements or reimbursements, and may not be comparable with those applied in other countries or institutions.



QLQ-C30
Global Health



QLQ-C30
Physical
Functioning

R Biffi et al, *Supp Care Cancer 2011*

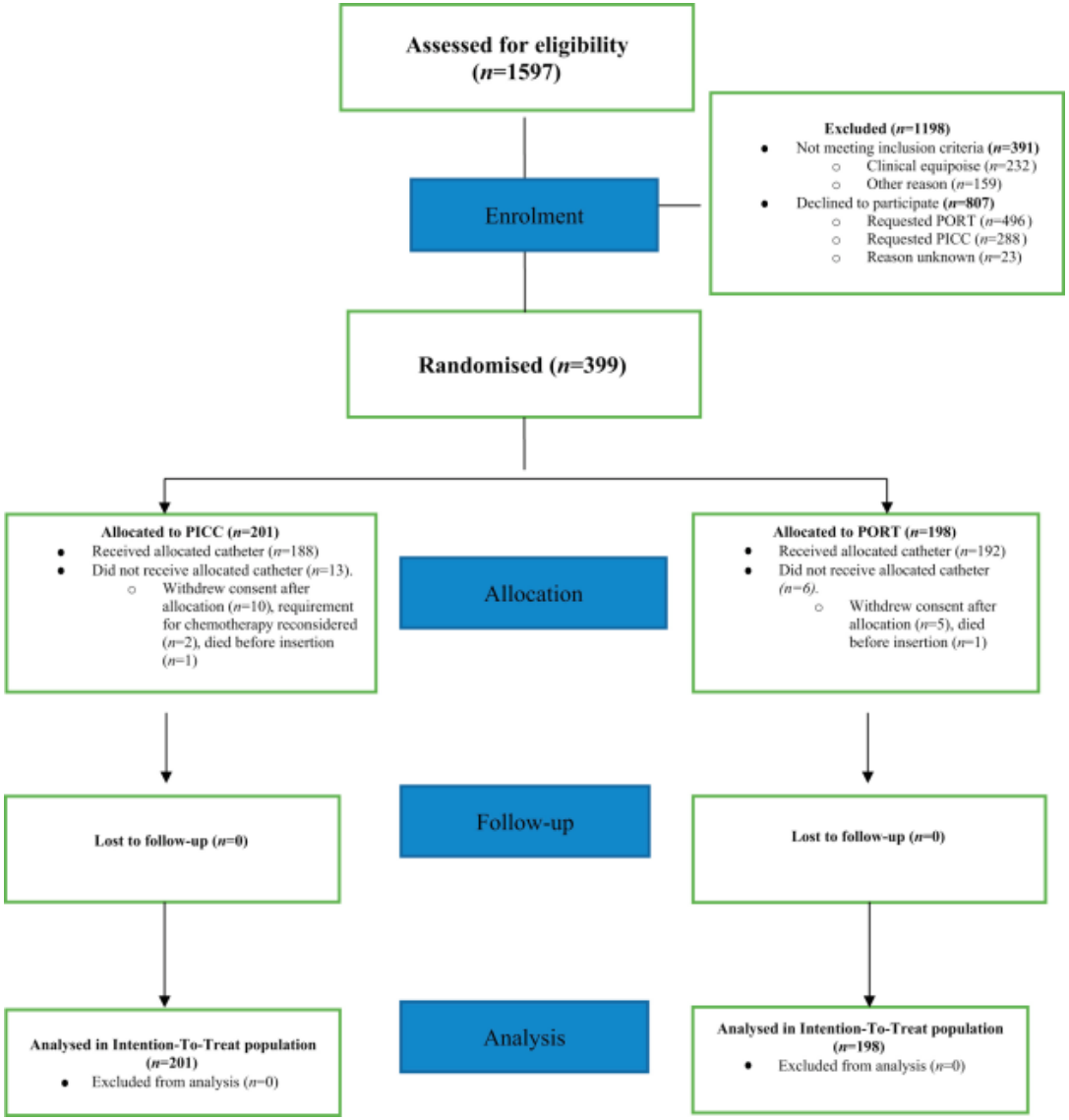
Clinical impact of peripherally inserted central catheters vs implanted port catheters in patients with cancer: an open-label, randomised, two-centre trial

Knut Taxbro[1,2,*], Fredrik Hammarskjold[1,2], Bo Thelin[3], Freddi Lewin[3], Helga Hagman[4], Hakan Hanberger[1,5] and Soren Berg[1,6]

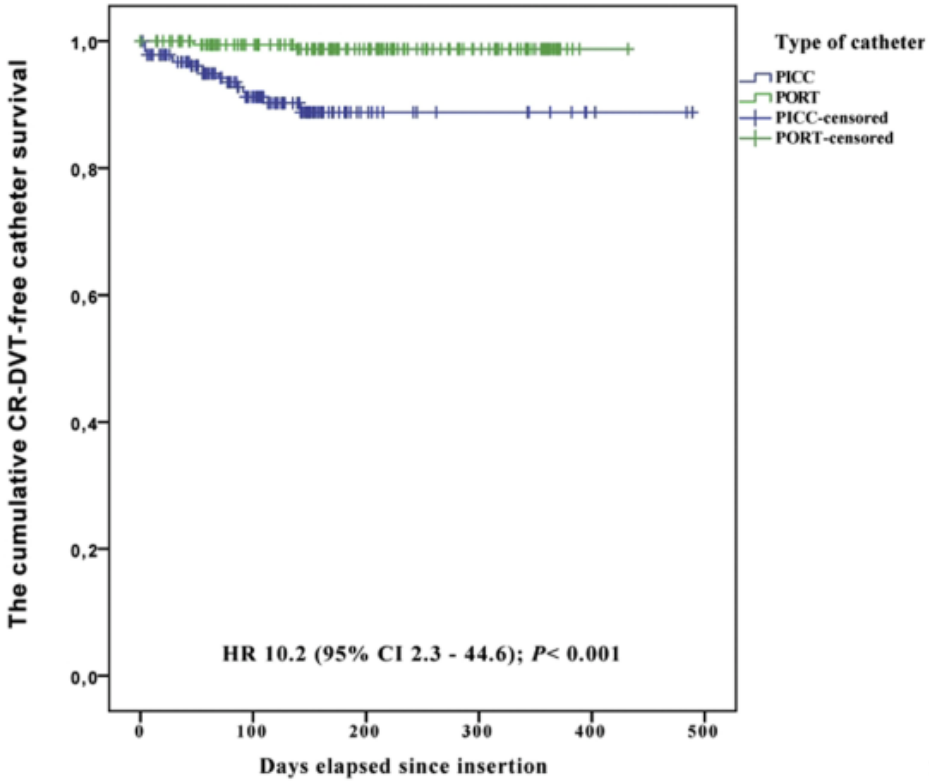
1University of Link€oping, Link€oping, Sweden, 2Department of Anaesthesia and Intensive Care Medicine, Ryhov County Hospital, J€onk€oping, Sweden, 3Department of Oncology, Ryhov County Hospital, J€onk€oping, Sweden, 4Department of Oncology, Ska°ne University Hospital, Lund, Sweden, 5Department of Infectious Diseases, Link€oping University Hospital, Link€oping, Sweden and 6Department of Cardiothoracic Anaesthesia and Intensive Care Medicine, Link€oping University Hospital, Link€oping, Sweden

British Journal of Anaesthesia, 122 (6): 734e741 (2019)
doi: 10.1016/j.bja.2019.01.038
Advance Access Publication Date: 17 April 2019
Clinical Practice

CONSORT data



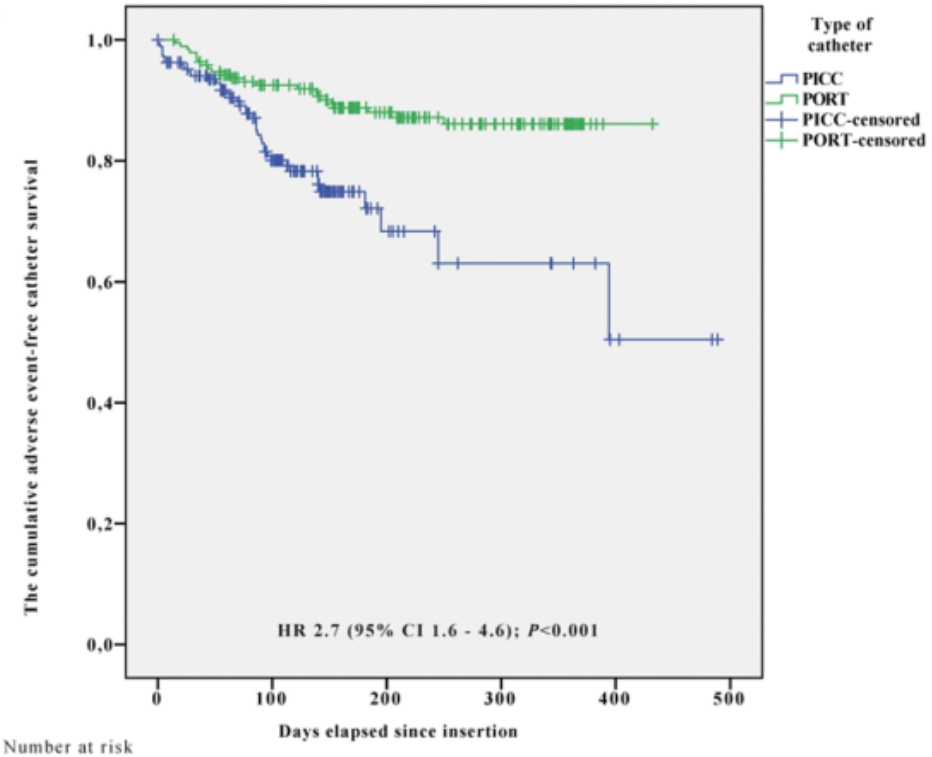
a



Number at risk

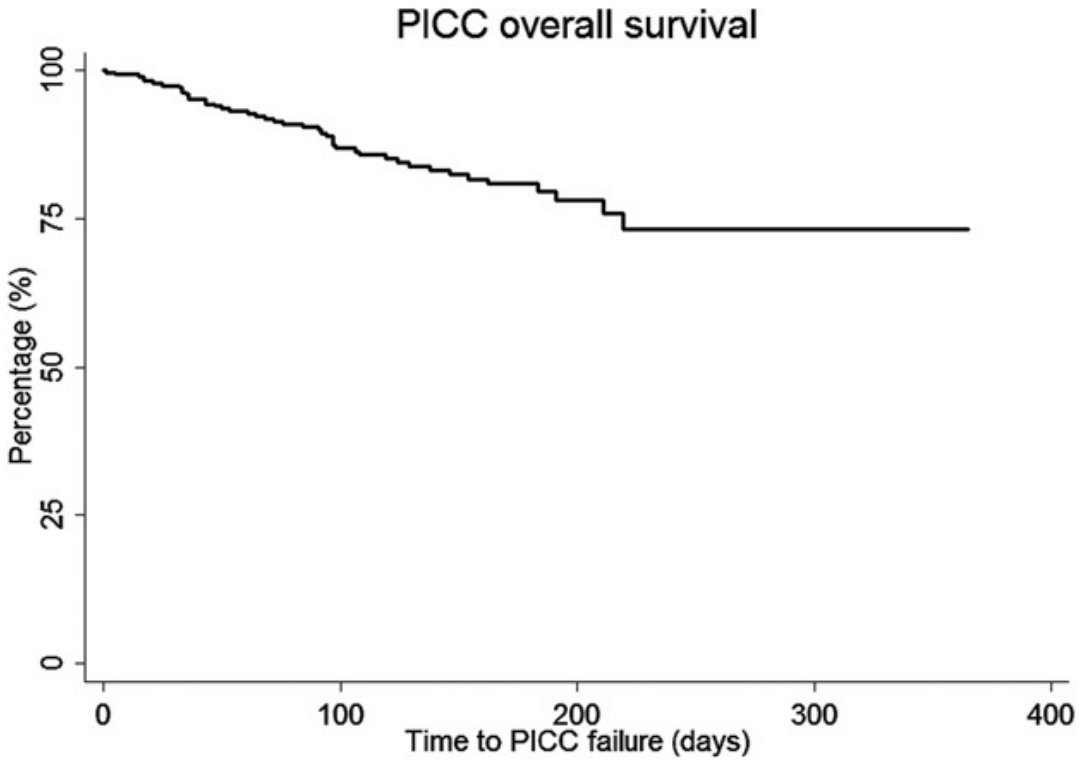
PICC	201	111	18	10	3	0
PORT	198	158	107	65	1	0

b



Number at risk

PICC	201	111	18	10	3	0
PORT	198	158	107	65	1	0



One hundred and eighty-six PICCs (64%) were removed without failure at the end of chemotherapy while 61 (21%) for patient's death. Kaplan–Meier survival curve of PICC free from failure is shown. **The proportion of patients free from failure at 1 year was 73% (95%CI, 64–82%).**

Editor's key points

Indwelling central venous catheters (CVCs) are often needed for cancer chemotherapy, and it is unknown whether there are differences in adverse events with peripherally inserted vs centrally inserted CVCs.

This trial randomised 399 adults with nonhaematological malignancy to receive a peripherally (201)- PICC or centrally (198) – CICC inserted CVC.

There were 16 (7.96%) catheter-related deep venous thromboses in the peripherally inserted CVC group, and two (1.01%) in the centrally inserted group (difference ¼6.95%; 95% confidence interval, 2.58 -11.89, P .001).

Centrally inserted indwelling CVCs might be associated with fewer adverse events than peripherally inserted CVCs.

J Surg Oncol. 2016 May;113(6):708-14. doi: 10.1002/jso.24220. Epub 2016 Mar 29.

Peripherally inserted central catheters (PICCs) in cancer patients under chemotherapy: A prospective study on the incidence of complications and overall failures.

Bertoglio S, Faccini B, Lalli L, Cafiero F, Bruzzi P.

BACKGROUND AND OBJECTIVES:
The increasing use of peripherally inserted central venous catheters (PICCs) for chemotherapy has led to the observation of an elevated risk of complications and failures. This study investigates PICC failures in cancer patients.

METHODS:
A prospective study was conducted at a single cancer institution on 291 PICC placement for chemotherapy. The primary study outcome was PICC failure.

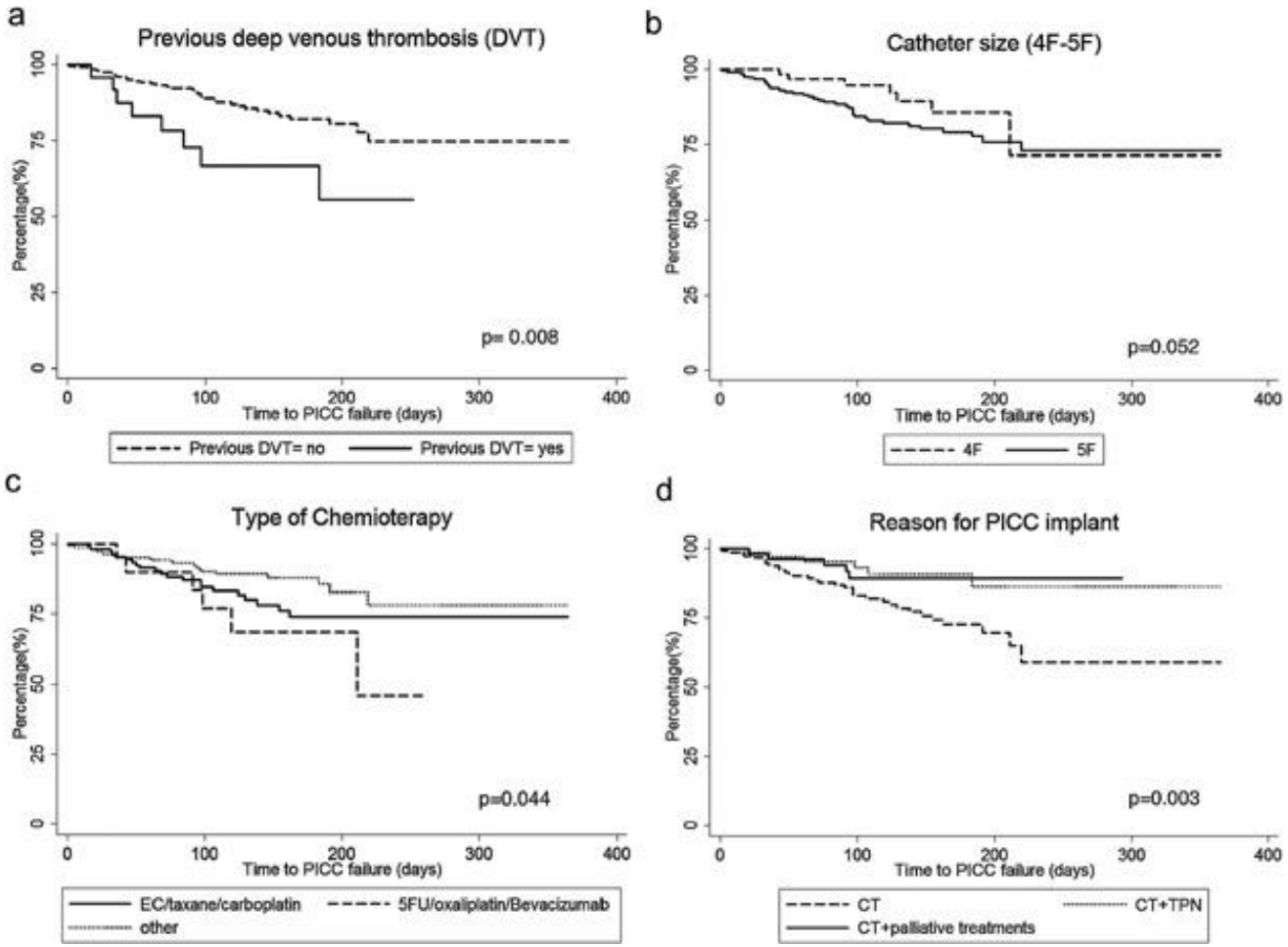
RESULTS:
Median follow-up was 119 days. PICC complications occurred in 72 patients (24.7%) and failures with removal in 44 (15.1%). Reasons for failures were upper extremity deep venous thrombosis (UEDVT) 12 (4.1%), central line associate bloodstream infection (CLABSI) 5 (1.7%) with an infection rate of 0.95 per 1,000 catheter days, exit site infection 9 (3.1%) with a rate of 1.46 per 1,000 catheter days, catheter dislodgment 11 (3.8%), and occlusion 7 (2.4%). Statistically significant risk factors were previous DVT (HR 2.95, 95%CI 1.33-6.53), reason for PICC implant (HR 3.65, 95%CI 1.12-10.34) and 5-fluorouracil, oxaliplatin and bevacizumab based chemotherapy (HR 3.11, 95%CI 1.17-8.26).

CONCLUSIONS:
PICC is a safe venous device for chemotherapy delivery. **Nevertheless, a 15% rate of failure has to be taken in account when planning PICC insertion for chemotherapy purposes.** J. Surg. Oncol. 2016;113:708-714.

**TABLE ANALYZES FREQUENCY OF COMPLICATIONS AND FAILURES.
SEVENTY-TWO PICCS (25%) DEVELOPED COMPLICATIONS AND 44 (15%)
WERE EVENTUALLY REMOVED FOR FAILURE.**

Frequency of Complications and Removal of 291 Observed PICCs *Bertoglio s et al , JSO 2018*

	Total complications		Removal	
Type of complications	n	%	n	%
PICC-UEDVT	34	11.7	12	4.1
PICC-CLABSI	6	2.1	5	1.7
Exit site infection	14	4.8	9	3.1
Dislodgement/inadvertent removal	11	3.8	11	3.8
Occlusion	7	2.4	7	2.4
Total	72	24.7	44	15.1



Kaplan–Meier PICC survival estimates for risk factors statistically significant for failure:
previous DVT (**a**),
catheter size (F, French) (**b**),
type of chemotherapy (E, epirubicin; C, cyclophosphamide) (**c**),
and reason for PICC implant (CT, Chemotherapy; TPN, total parenteral nutrition) (**d**).

Catheter size variable was borderline significant (*P* = 0.052).

Acta Anaesthesiol Scand. 2019 Nov 12. doi: 10.1111/aas.13505. [Epub ahead of print]

Cost analysis comparison between peripherally inserted central catheters and implanted chest ports in patients with cancer - a health economicevaluation of the PICCPORT trial.

Taxbro K[1], Hammarskjöld F[2], Juhlin D[2], Hagman H[3], Bernfort L[4], Berg S[5].

Author information

1 Department of Anaesthesia and Intensive Care Medicine, Ryhov County Hospital, and Cardiovascular Medicine, Department of Medical and Health Sciences, Linköping University, Linköping, Sweden.
2 Department of Anaesthesia and Intensive Care Medicine, Ryhov County Hospital, Jönköping, Sweden.
3 Department of Oncology, Skåne University Hospital, Lund, Sweden.
4 Division of Health Care Analysis, Linköping University, Linköping, Sweden.
5 Department of Cardiothoracic Surgery, Anaesthesia and Intensive Care, Department of Medical and Health Sciences, Linköping University, Linköping, Sweden.

Abstract

BACKGROUND:

A reliable central venous access device is a cornerstone in the treatment of cancer. Both peripherally inserted central catheters (PICC) and totally implanted chest ports (PORT) are commonly used for the delivery of chemotherapy. Both types of catheter can cause adverse events such as catheter-related deep venous thrombosis (CR-DVT), infection and mechanical complications.

METHOD:

We conducted a randomised controlled trial including 399 patients with cancer and performed a health economic evaluation investigating the cost related to PICCs and PORTs using several clinically relevant dimensions from a health care perspective. The cost was determined using process and cost estimate models.

RESULT:

PICCs are associated with a higher total cost when compared with PORTs.Combining the costs of all categories, the prize per inserted device was 824.58 EUR for PICC and 662.34 EUR for PORT. When adjusting for total catheter dwell time the price was 6.58 EUR/day for PICC and 3.01 EUR/day for PORT.The difference in CR-DVT was the main contributor to the difference in cost. The daily cost of PICC is approximately twice to that of PORT.

CONCLUSION:

We have demonstrated that the cost from a healthcare perspective is higher in cancer patients receiving a PICC than to those with a PORT. The difference is driven mainly by the cost related to the management of adverse events. Our findings are relevant to anaesthetists, oncologists and vascular access clinicians and should be considered when choosing vascular access device prior to chemotherapy.

Editor's comment

This study reports that the cost in a health care perspective is higher when peripherally-inserted central catheters (PICC) are used compared to totally implanted venous chest injection ports. The cost difference is mainly driven by the higher frequencies of complications and their treatments in patients for those with PICC lines.

Peripherally inserted central catheter–related thrombosis rate in modern vascular access era—when insertion technique matters: A systematic review and meta-analysis

Balsorano P et Al, J Vasc Access. 2019 Jun 10:1129729819852203. doi: 10.1177/1129729819852203. [Epub ahead of print]

Abstract

BACKGROUND:
Technical factors at the moment of catheter insertion might have a role in peripherally inserted central catheter-related thrombotic risk. We performed a systematic review and meta-analysis to define the actual rate of peripherally inserted central catheter-related symptomatic deep vein thrombosis in patients in whom catheter insertion was performed according to ultrasound guidance, appropriate catheter size choice, and proper verification of tip location.

METHODS:
We searched Medline, Embase, and Cochrane Library. Only prospective observational studies published in peer-reviewed journals after 2010 up to November 2018 reporting peripherally inserted central catheter-related deep vein thrombosis rate were included. All studies were of adult patients who underwent peripherally inserted central catheter insertion. Results were restricted to those studies which included in their methods ultrasound guidance for venipuncture, catheter tip location, and a catheter size selection strategy. Random-effect meta-analyses and arcsine transformation for binomial data were performed to pool deep vein thrombosis weighted frequencies.

RESULTS:
Of the 1441 studies identified, **15 studies involving 5420 patients and 5914 peripherally inserted central catheters** fulfilled our inclusion criteria. **The weighted frequency of peripherally inserted central catheter-related deep vein thrombosis was 2.4% (95% confidence interval = 1.5-3.3) and remained low in oncologic patients (2.2%, 95% confidence interval = 0.6-3.9).** Thrombotic rate was higher in onco-hematologic patients (5.9%, 95% confidence interval = 1.2-10**). Considerable heterogeneity (I^2 = 74.9) was observed and all studies were considered at high risk of attrition bias.**

CONCLUSIONS:
A proper technique is crucial at the moment of peripherally inserted central catheter insertion. Peripherally inserted central catheter-related deep vein thrombosis rate appears to be low when evidence-based technical factors are taken into consideration during the insertion procedure.

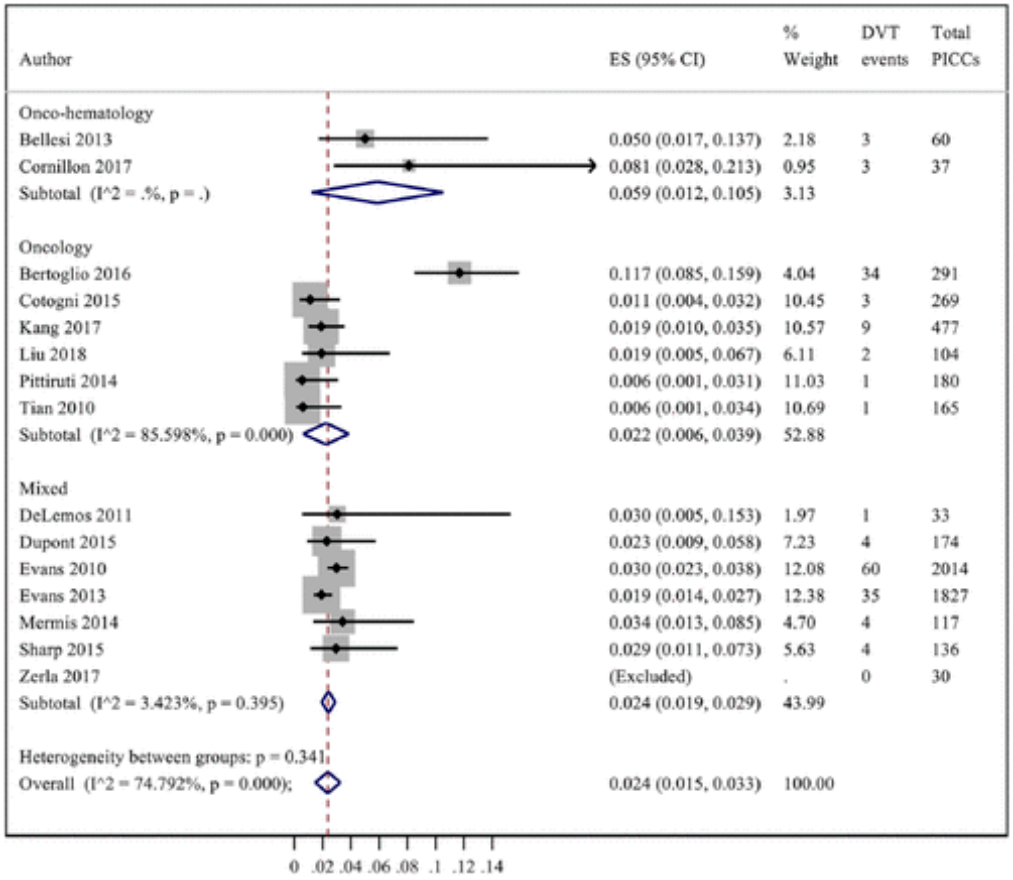


Figure 2. Forest plot showing weighted frequencies of PICC-related deep vein thrombosis rate.
Random-effect meta-analysis for PICC-related deep vein thrombosis rate and subgroup stratification by diagnosis..

Peripherally inserted central catheter–related thrombosis rate in modern vascular access era—when insertion technique matters: A systematic review and meta-analysis
Balsorano P et Al, J Vasc Access. 2019 Jun 10:1129729819852203. doi: 10.1177/1129729819852203. [Epub ahead of print]

Our results should be interpreted in the context of some limitations. First, **none of our studies had a comparison group which did not allow us to estimate pooled odds ratios (ORs) of PICC-related venous thromboembolism in comparison with other devices**. As a result, we were only able to estimate pooled frequencies for the desired outcome. In addition, the two randomized trials included in our analysis were not designed in order to compare different insertion techniques

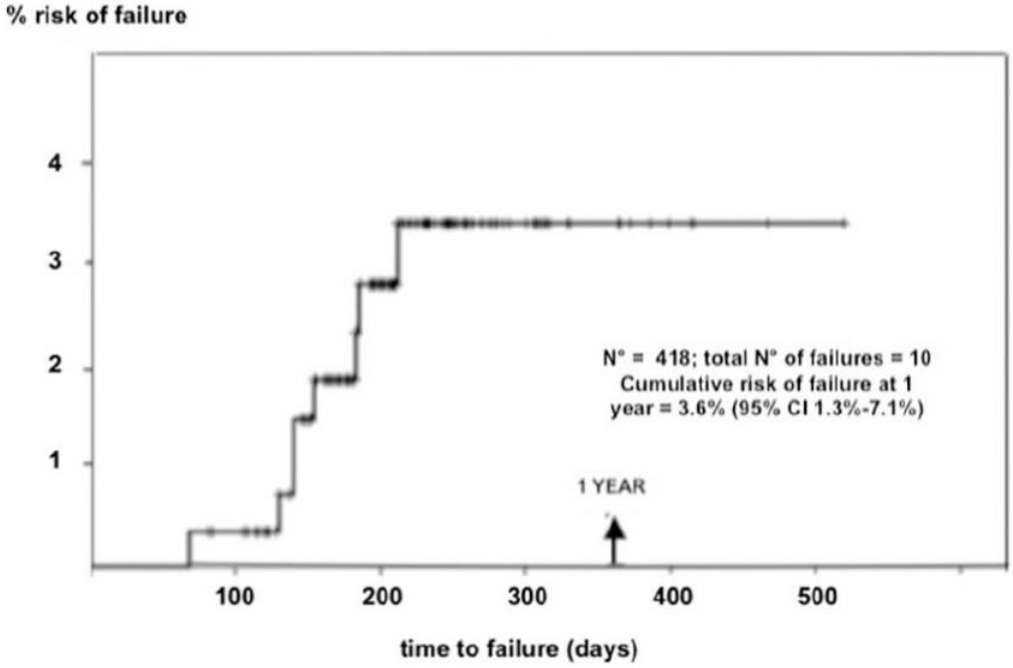


Figure 2. Kaplan–Meier curve for PICC-PORT cumulative 1-year risk of failure.

Original research article

JVA The Journal of Vascular Access

The Journal of Vascular Access
1–7
© The Author(s) 2019
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/1129729819884482
journals.sagepub.com/home/jva
SAGE

PICC-PORT totally implantable vascular access device in breast cancer patients undergoing chemotherapy

Sergio Bertoglio[1,2], Ferdinando Cafiero[2], Paolo Meszaros[3], Emanuela Varaldo[1,2], Eva Blondeaux[4], Chiara Molinelli[4] and Michele Minuto[1,2]

Abstract

Background and objectives: The increasing use of arm totally implantable vascular access devices for breast cancer patients who require chemotherapy has led to a greater risk of complications and failures and, in particular, to upper extremity deep vein thrombosis. This study aims to investigate the outcomes of the arm peripherally inserted central catheter-PORT technique in breast cancer patients.

Methods: The peripherally inserted central catheter-PORT technique is an evolution of the standard arm-totally implantable vascular access device implant based on guided ultrasound venous access in the proximal third of the upper limb with subsequent placement of the reservoir at the middle third of the arm. A prospective study was conducted on 418 adult female breast cancer patients undergoing chemotherapy. The primary study outcome was peripherally inserted central catheter-PORT failure.

Results: Median follow-up was 215 days. Complications occurred in 29 patients (6.9%) and failure resulting in removal of the device in 11 patients (2.6%). The main complication we observed was upper extremity deep vein thrombosis, 10 (2.4%); all patients were rescued by anticoagulant treatment without peripherally inserted central catheter-PORT removal. The main reason for removal was reservoir pocket infection: 4 (0.9%) with an infection rate of 0.012 per 1000 catheter days. Cumulative 1-year risk of failure was 3.6% (95% confidence interval, 1.3%–7.1%). With regard to the patients' characteristics, body mass index <22.5 was the only significant risk for failure ($p = 0.027$).

Conclusion: The peripherally inserted central catheter-PORT is a safe vascular device for chemotherapy delivery that achieves similar clinical results as traditional long-term vascular access devices (peripherally inserted central catheter and arm totally implantable vascular access device, in particular) in breast cancer patients.

Keywords

Venous access device, totally implantable vascular access device, peripherally inserted central catheter, complications, breast cancer, chemotherapy

Date received: 6 August 2019; accepted: 27 September 2019

Introduction

Totally implantable vascular access devices (TIVADs), also named ports, are widely used in cancer patients to facilitate the infusion of intravenous chemotherapy (CT), fluid supplementation and long-term supportive care. Historically, TIVADs have been implanted into the anterior chest wall accessing the subclavian or the internal jugular vein.[1–3] More recently, peripheral insertion of arm TIVADs has become more widespread as an alternative to chest wall TIVADs in an attempt to reduce complication

[1]Department of Surgical Sciences (DISC), University of Genova, Genova, Italy
[2]General Surgery Unit 1, Department of Surgery, IRCCS Ospedale Policlinico San Martino, Genova, Italy
[3]Breast Surgical Unit, Department of Surgery, IRCCS Ospedale Policlinico San Martino, Genova, Italy
[4]Oncologia Medica Unit 2, Department of Medical Oncology, IRCCS Ospedale Policlinico San Martino, Genova, Italy

Corresponding author:
Sergio Bertoglio, Department of Surgical Sciences (DISC), University of Genova, Largo Rosanna Benzi 10, 16132 Genova, Italy.
Email: sergio.bertoglio@unige.it

Table 2. Frequency of complications and removal of 209 observed PICC-PORTs.

Type of complication	Total complications		Port removal due to failure	
	n	%	*n*	%
Catheter occlusion	3	0.7	3	0.7
PICC-PORT CRBSI	2	0.5	2	0.5
Pocket infection	4	1	4	1
Skin dehiscence	2	1.0	–	–
Drug extravasation	6	1.4	2	0.5
Drug leakage	2	0.5	–	–
PICC-PORT UEDVT	10	2.4	–	–
Total	29	6.9	11	2.6

CRBSI: catheter-related bloodstream infection; UEDVT: upper extremity deep vein thrombosis; PICC: peripherally inserted central catheter. Multiple complications in the same subject were counted only once.

Per minimizzare gli effetti negativi dei VAD/DAV:

- Posizionare il dispositivo solo se necessario
- Scegliere il dispositivo più appropriato In termini di sicurezza del paziente e di costo-efficacia
- Definizione di bundle di inserzione per ciascun DAV (accurati e aggiornati)
- Definizione di bundle di mantenimento per ciascun DAV (accurati e aggiornati)

1) Scelta tra DAV periferico e DAV centrale

2) Scelta tra diverse opzioni di DAV periferico

• Cannule corte • Mini-midline • Midline

3) Scelta tra diverse opzioni di DAV centrale **ONCOLOGIA**

• A livello intraospedaliero

• CICC • PICC • FICC

• A livello extraospedaliero

• Cateteri esterni • Port

Accesso venoso centrale extra-ospedaliero in oncologia

Medio termine (< 4-6 mesi)

Prima scelta:
PICC, tunnellizzato o no (+ **SAS ?** NdR)

Seconda scelta (se PICC controindicato):
CICC tunnellizzato

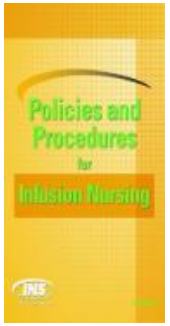
Terza scelta: (ostruzione VCS):
FICC tunnellizzato

Lungo termine (> 4-6 mesi)

*** Uso infrequente** (< 1/settimana):
- port toracico
- PICC- port

*** Uso frequente** (> 1/settimana): CICC, PICC, FICC:
- tunnelllizzati-cuffiati
- opp. tunnellizzati + SAS

(* vedi linee guida EPIC e INS)



MANY THANKS FOR YOUR ATTENTION

Roberto Biffi, MD, PhD, FSPS
Director
Unit of Peritoneal Cancer Surgery
Dept. of G-I Surgery

Ovarian Cancer Center
ESAGON CoDirector

Adjunct Professor of General Surgery
University of Milan

European Institute of Oncology,
Milan, Italy