

La trombosi da PICC in Terapia Intensiva: inevitabile o prevenibile?

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La trombosi da PICC in Terapia Intensiva: inevitabile o prevenibile?

PICC

si associano realmente ad un aumento di CRT
rispetto ai CVC?

Fattori di rischio:

- Vene di minore diametro
- Maggiore interazione vena/catetere
- Maggior rischio di malposizioni
- Maggior rischio di danno intinale

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PICC tradizionali (XX secolo)

Inserzione "blind" al gomito
Impossibilità di conoscere il diametro della vena
Catetere mobile

Eco-PICC (XXI secolo)

Inserzione ecoguidata a 75° braccio
Match tra diametro vena e diametro catetere
Ottima stabilizzazione

Trombosi in epoca di impianto blind

38% degli impianti

- a) Cefalica 57%
- b) Basilica 14%
- c) Brachiale 10%

Allen, 2000

Trombosi in epoca di impianto ecoguidato

1-4% degli impianti

Chenmaj, 2002; Abdallah, 2005; Chaitowitz, 2005; Ong, 2005; King, 2006;
Seelap, 2007; Dubois, 2007; Evans, 2007; Thomsberg, 2008; Nash, 2009

La trombosi da PICC in Terapia Intensiva

CONTRIBUISCONO ALTRI FATTORI DI RISCHIO

Fattori di rischio aggiuntivi:

- Condizioni critiche (meccaniche, mediatori)
- Utilizzo intensivo
- Farmaci specifici (mannitolo)

Leclercq et al. J Vasc Access 2014;19 (3): 328-337

Aumento 'apparente' delle trombosi da PICC ?

- ❑ Estensione delle indicazioni del PICC : maggior numero di impianti e maggiore eterogeneità dei pazienti (Unità di Terapia Intensiva, pazienti settici, pazienti onco-ematologici in terapia clottistica)
- ❑ TVP arti superiori più facilmente sintomatiche, e diagnosticabili, di quelle centrali
- ❑ Maggior uso dell'ecografo per venipuntura = maggior uso dell'ecografo per controllo a distanza
- ❑ Sovradiagnosi ecodoppler (manicotto di fibrina interpretato come trombosi)

La trombosi da PICC in Terapia Intensiva:

inevitabile (o prevenibile?)

Analisi della letteratura

ELEMENTI DA CONSIDERARE

- Blind PICCs vs. Eco-PICC
- Trombosi sintomatica vs. asintomatica
- Match diametro vena/diametro catetere vs. scelta casuale del catetere

2000

Venous Thrombosis Related to Peripherally Inserted Central Catheters¹

Jay R. Green, MD
William C. Pines, MD

OBJECTIVE To determine factors that may lead to higher rates of venous thrombosis in patients with peripherally inserted central catheters (PICCs).

Blind PICCs.
Aumento diametro = aumento rischio trombotico.
No match vena/catetere

2006

Journal of Surgical Research

Peripherally Inserted Central Venous Catheters
Are Not Superior to Central Venous Catheters in
the Acute Care of Surgical Patients on the Ward

Simon Turcotte, MD, Serge Dubé, MD, MSc, Gilles Beauchamp, MD
Département de Chirurgie, Hôpital Ste-Justine-Université, Centre affilia à l'Université de Montréal, 3175 rue de
Hochelague Montréal, Québec H3T 1M5, Canada

Meta-analisi 1979-2004 - quasi tutti blind-PICC
Trombosi variabile da 1.4 a 7.8 %

2008

Original Communication

The Incidence of PICC Line-Associated Thrombosis With and Without the Use of Prophylactic Anticoagulants

James D. Pines, MD, PhD¹, Heather Barkin, MD², Nicholas Ingells, MD³,
Sarah Boettcher⁴, Susan Lamberth⁵, Brian Pedersen, MD⁶,
Austin Goldenrich, MD⁷, and Alan T. Davis, PhD^{1,2*}

56 PICC (blind)
Trombosi asintomatica 33% ma 22% con anticoagulanti

2012

J Vasc Med Biol 2012; 24(2):127-134
DOI: 10.1177/1077319111416639

ORIGINAL ARTICLE

Risk factors for upper extremity venous thrombosis associated with peripherally inserted central venous catheters

Thomas Marzjan^{1,2}, Debra Angelis³, Ahmed M. Khaled⁴, David Cassell⁵

¹Department of Internal Medicine, St. Elizabeth Health Center, Springfield, OR 97531
²Department of Medicine, Northwestern - Feinberg School of Medicine, Chicago, Illinois, USA
³Department of Medical Education and Research, St. Elizabeth Health Center, Springfield, OR 97531

Retrospective, case-control study, 480 PICC, tutti eco
Rossa incidenza
Fattori di rischio: basilica, lato sinistro, NP, vancomicina

2012

Support Care Cancer 2012 Aug 4. [Epub ahead of print]

Peripherally inserted central catheters (PICCs) in the management of oncohematological patients submitted to autologous stem cell transplantation.

Battistini S, Chiusolo P, De Pascale G, Pittini M, Scoppettuolo G, Morabito S, Giannantonio S, Sorli F, Laurenti L, Leone G, Sica B

Source

Hematology Department, Università Cattolica S. Cuore, Largo A. Gemelli 5, 00168, Roma, Italy, sbattistini@unicatt.it

63 PICC silicone in pazienti BMT
Trombosi sintomatica 5%

2012

Ultrasound-guided peripherally inserted central catheters (picc) in cancer patients: success of the insertion, survival and complications

Murruza Durlito, Maria Inmaculada, Gerardo-Estherique, Lucía, Miranda-Semero, Enrique, Armenteros-Tegada, Victoria, Torralba-López, María Aracazo, Beatriz Delgado, Beatriz

Published in Enferm Clin. 2012;22:135-43. - vol.22 núm.03

165 PICC, tutti eco-picc
CRT = 0.03 per 1000 ggcat

2012

Journal of Parenteral and Enteral Nutrition

<http://jpen.sagepub.com>

Catheter-Related Complications in Cancer Patients on Home Parenteral Nutrition: A Prospective Study of Over 51,000 Catheter Days

Paula Delgado, María Pineda, Cristina Rodríguez, Tere Moya, Agustina Pardo and Carlos Sagga-Beltrán
J Parent Sci Technol 2012; 36(3):155-160
DOI: 10.1177/1078348311416639

The online version of this article can be found at
<http://jpen.sagepub.com/content/36/3/155.full>

165 PICC (11,900 ggPICC) in neoplastici in NPO – protocollo SIP
Nessuna trombosi sintomatica

2012

Original Contribution

Role of Peripherally Inserted Central Catheters in Home Parenteral Nutrition: A 5-Year Prospective Study

Jose E. Sanchez-Carreras, MD, PhD^{1,2}, Carlos J. Garcia, MD³, Jose Garcia, MD⁴, Ricardo Yañez, MD⁵, Francisco Artalejo, MD, PhD⁶, Alberto Caldeira, MD, PhD⁷, Isabel Pascual, MD⁸, Jose A. Eche, MD, PhD^{9,10}, and Carlos Viquez, MD, PhD¹¹

Abstract

Background:

Objective:

Design:

Setting:

Subjects:

Measures and Main Results:

Conclusions:

Keywords:

Abbreviations:

Conflict of Interest:

Declaration of Ethics:

References:

Supplemental Digital Content:

Copyright:

Reprints:

Permissions:

Correspondence:

Address:

Phone:

Fax:

E-mail:

Keywords:

Abbreviations:

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2012

Journal of Intensive Care Med 2012; 27(1):17-24
DOI: 10.1177/1078348311416639

ORIGINAL

Thomas J. Wilson
William E. Moore
William E. Miller Jr.
D. Andrew Whitcomb
Jeffrey J. Huhner

Risk factors associated with peripherally inserted central venous catheter-related large vein thrombosis in neurological intensive care patients

• retrospettivo, 431 PICC, non riportato il materiale (poliuretano/silicone 7)
• 6.4% trombosi sintomatiche
• correlazione con progressa TVP, alto pareggio, intervento chirurgico > 1h, mannitolo

2014

10 Jul 2014 doi:10.1186/s12937-014-0040-0

A comparative study of peripherally inserted and Broviac catheter complications in home parenteral nutrition patients

Scott A¹, Sullivan D², Hsieh C², Bernard D², Lawrence M², Jones D²

¹ Author information

Abstract

BACKGROUND & aims: Peripherally inserted central venous catheters (PICCs) have become increasingly popular for infusion to long-term parenteral nutrition (PN) but there is limited data on the complication rates in this sub-group. We aimed to compare the rates of complications associated with Broviac catheters (Broviacs) and PICC in home PN patients.

Methods: An adult patients in an PN program with a new Broviac or new PICC between 2008 and 2011 were included in the prospective observational study. Complication rates were compared by using Fisher's exact test and Kaplan-Meier survival curve were used to compare the time to complications that occurred.

Results: 304 catheters (158 Broviacs and 146 PICCs) were inserted in 180 adult patients. Mean follow-up from catheter insertion to final removal was 279 ± 218 days for Broviac (n = 95) vs. 74 ± 143 days for PICC (n = 109), p = 0.001. Complications were similar between Broviacs and PICCs (30.1% vs. 30.8%). Catheter infection rate was lower in PICCs (1.4% vs. 1.8% per 1000 catheter days, p = 0.01). Catheter dislodgement rates were similar for both catheters (5mg PICC-associated venous thromboses (0.4/1000)). The proportion of catheters removed was lower in the Broviac group than in the PICC group (50.4% vs. 19.4%, p = 0.01), but those removed for complications were not different (26.6% Broviacs, 30.4% PICCs, p = 0.56).

Conclusions: In PN patients, overall complications were similar in both the PICC and the Broviac groups. However, the Broviac catheter could be associated with an increase in catheter infection.

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Trombosi: 1 PICC su 11

2014

PLoS One 2014; 9(10):e109239

DOI: 10.1371/journal.pone.0109239

REVIEW

Peripherally inserted central catheter (PICC)-related thrombosis in critically ill patients

Valérie Zechin¹, Imran Umar², Nicola Singari², Nicola Jones¹

¹ Cardiovascular Intensive Care Unit, Critical Care Area, Papworth Hospital NHS Foundation Trust, Papworth (Cambridge) – UK

² Department of Surgery, University Hospitals of Leicester NHS Trust, Leicester Royal Infirmary, Leicester – UK

³ Intensive Care Unit, Department of Anaesthesia and Critical Care, Retiring General Hospital, NHS Foundation Trust, Retiring, Northamptonshire – UK

Review discutibile: mette insieme 'blind PICCs' e 'US-PICCs'

2014

14 October 2014, doi:10.1186/s12937-014-0040-0

Peripherally inserted central catheter-related deep vein thrombosis: contemporary patterns and predictors

Chen C¹, Wells G², Wells G², Wells G²

¹ Author information

Abstract

BACKGROUND: Despite growing use, peripherally inserted central catheters (PICCs) are associated with risk of deep vein thrombosis (DVT). We designed a study to determine patient, provider and device factors associated with this outcome.

METHODS: This was a retrospective cohort study of adults who underwent PICC placement between 1 June 2008 to 30 June 2012. Symptomatic PICC-associated DVT was confirmed by ultrasound. Because PICCs are also recognized risk factors for lower extremity DVT, lower extremity DVT occurring within the PICC site is also included. Multivariable logistic and Cox proportional hazards regression models were fit to examine the association between covariates specified a priori and PICC-DVT. Odds ratios (ORs) and hazard ratios (HRs) with corresponding 95% confidence intervals (CIs) were generated.

RESULTS: Of 861 unique PICC placements, 53 patients developed symptomatic PICC-associated DVT and 6 developed lower extremity DVT, accounting for 61 thrombotic events. On bivariate analysis, recent diagnosis of cancer, organ-transplant, placement, chemotherapy administration, number of tumors and PICC gauge were associated with PICC-DVT. Following multivariable adjustment, recent cancer diagnosis (OR 1.88 (95% CI 1.01 to 3.50) and PICC gauge (HR 1.21 (95% CI 1.04 to 1.40) and HR 1.48 (95% CI 1.1 to 1.88) for 5-Fr and 6-Fr PICCs, respectively) remained associated with thrombosis.

CONCLUSIONS: Recent diagnosis of cancer and PICC gauge are associated with PICC-DVT. These findings have important clinical implications and suggest that placement of large gauge PICCs or PICCs in patients with cancer may provide thrombotic, improved outcome and potential outweighs in these cases appear necessary to prevent PICC-DVT.

Publisher: BMC. This article is a U.S. Government work and, as such, is in the public domain in the USA.

KEYWORDS: central venous catheter thrombosis, central venous catheters, deep vein thrombosis, peripherally inserted central catheterization, upper extremity deep vein thrombosis, venous thrombosis

Parola di ricerca: malattia neoplastica, catetere del catetere

Risk Factors Associated With Catheter-Related Upper Extremity Deep Vein Thrombosis in Patients With Peripherally Inserted Central Venous Catheters: Literature Review Part 1

Analizzati 28 fattori di rischio in letteratura

Factor	Study	OR	95% CI
Age	1	1.0	0.9-1.1
Gender	1	1.0	0.9-1.1
Weight	1	1.0	0.9-1.1
Height	1	1.0	0.9-1.1
Body mass index	1	1.0	0.9-1.1
Time to placement	1	1.0	0.9-1.1
Time to removal	1	1.0	0.9-1.1
Time to complication	1	1.0	0.9-1.1
Time to death	1	1.0	0.9-1.1
Time to discharge	1	1.0	0.9-1.1
Time to readmission	1	1.0	0.9-1.1
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Time to removal	1	1.0	0.9-1.1
Time to death	1	1.0	0.9-1.1
Time to discharge	1	1.0	0.9-1.1
Time to readmission	1	1.0	0.9-1.1
Time to reinsertion	1	1.0	0.9-1

Rischio di trombosi

Alcuni studi datati (circa 30 aa. fa) avevano suggerito differenze in termini di rischio trombotico, tra materiali diversi

Cursiteru 1983	SIL meglio che PE
Cursiteru 1984	PUR = PE
Pottecher 1984	PUR e SIL > PE
Linder 1984	PUR > SIL

Rischio di trombosi

Studi recenti non hanno evidenziato differenze tra PUR e SIL in termini di rischio

Beau 1999
Pillrud 2009
Bonizzi 2011
Myskag 2012

Rischio di trombosi

Studi recenti hanno mostrato risultati controversi tra PIOC in P-PUR

Nichols 2008	P-PUR = low risk of DVT
Tierotola 2010	P-PUR = high risk of DVT (8 PR)
Pillrud 2012	P-PUR = low risk of DVT

Rischio di trombosi

GAVeCeLT 2007

3. Role of device or material in establishing the risk

Currently a wide variety of central venous catheters are commonly used in practice. Major design differences have led to the development of catheters that vary in their design, material, and size. Catheter type and material have not been rigorously evaluated, and evidence suggests that catheter type and material may influence the risk of catheter-related thrombosis. The purpose of this review is to evaluate the evidence regarding the role of catheter type and material in establishing the risk of catheter-related thrombosis.

Conclusions of the Committee
Silicone and second-thrust-generation polyurethane catheters are less thrombogenic than polyethylene or PVC ones. A lower diameter catheter and a single lumen might be protective against the risk of central venous thrombosis.
Strength of Recommendations

Rischio di trombosi

SOR 2008

Review

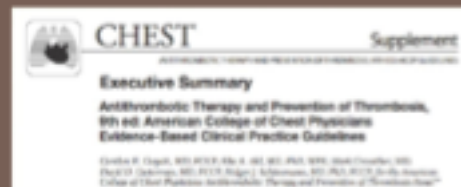
2008 SOR guidelines for the prevention and treatment of thrombosis associated with central venous catheters in patients with cancer: report from the working group

P. Baccarelli¹, G. Rossi², G. La Spina³, A. Mignani⁴, E. Scavroni⁵, M. C. Scavroni⁶, J. Esposito⁷, G. Manno⁸, P. Weyant⁹, M. Paoletti¹⁰, M. L. Scavroni¹¹, H. Lohmann¹², J. M. Rosenthal¹³ & G. Rago¹⁴ on behalf of the working group of the SOR

Nessuna raccomandazione riguardo al materiale dei cateteri

Rischio di trombosi

ACCP 2012



Nessuna raccomandazione riguardo al materiale dei cateteri

JOURNAL OF VASCULAR ACCESS	
A comparison of silicone and polyurethane PICC lines and post insertion complication rates: A systematic review (Manuscript Draft)	
Manuscript Number:	JVA-D-14-00102
Full Title:	A comparison of silicone and polyurethane PICC lines and post insertion complication rates: A systematic review
Short Title:	A comparison of peripherally inserted central catheters
Article Type:	Review
Section Category:	Nursing
Keywords:	Complications, medical imaging nursing, peripherally inserted central catheter, vascular access
Manuscript Region of Origin:	AUSTRALIA

Scelta del Lato

Lato dominante
Arto non paralizzato o piegico
Assenza di segni locali di infezione
Posizione non obbligata (anchilosi, artrosi grave, atteggiamento spastico)

Scelta della vena

1. Vena BASILICA
2. Vene BRACHIALI
3. Vena CEFALICA
4. ??

Valutazione rapporto vena/diametro

CHEST Original Research **2011**

The Effect of Catheter to Vein Ratio on Blood Flow Rates in a Simulated Model of Peripherally Inserted Central Venous Catheters

Wong TP, Wong, M, and Macdonald T. *Chest* 2011

Abstract: A peripherally inserted central catheter (PICC) is inserted into the vein. The catheter to vein ratio (CVR) is the ratio of the catheter diameter to the vein diameter. The study was designed to determine the effect of CVR on blood flow rates in a simulated model of peripherally inserted central venous catheters (PICCs). The study was conducted in a laboratory setting. The study was designed to determine the effect of CVR on blood flow rates in a simulated model of peripherally inserted central venous catheters (PICCs). The study was conducted in a laboratory setting.

Stasi venosa

Diametro del Catetere in relazione alla dimensione vena

Vein	Initial Flow	2 Fr	4 Fr	6 Fr	8 Fr				
Cephalic (cm)	10	5	48%	3	28%	1.5	14%	0.5	0.5%
Brachial (cm)	25	13	53%	9	36%	6	22%	3	12%
Basal (cm)	52	29	56%	21	41%	15	28%	9	18%
Antley (cm)	164	100	61%	79	48%	62	38%	47	28%
Subclavian (cm)	400	256	64%	212	53%	175	44%	143	36%

Wong TP & Macdonald T. *CHEST* Published online before print February 24, 2011

Minimo traumatismo

Venipuntura ecoguidata

Sempre e comunque

Tecnica Seldinger indiretta

Ago appropriato 21G ecogeno

Mai con ago cannula!

Guida appropriata (floppy straight tip)

Microintroduzione appropriata (rastrematura ottimale)

Verifica della posizione della punta

Verifica 'real time' con tecnica dell'ECG intracavitario

Stabilizzazione

Catetere stabile = meno frizione (trauma) nel punto di inserzione

- ✓ Sede appropriata (1/3 mediale braccio)
- ✓ Sutureless device
- ✓ Membrana trasparente semipermabile
- ✓ Colla

2012

Thaler et al. *Crit Care* 2012, 16(1):R103
<http://dx.doi.org/10.1186/cc11610>

CRITICAL CARE

RESEARCH Open Access

Clinical experience with power-injectable PICCs in intensive care patients

Walter Petriti¹, Alberto Bui², David Coleman³, Michaela Hengstler⁴, David C. Howell⁵, Peter Giuseppe Armita⁶ and Giovanni Suppeschi⁷

See related article by Semperl, <http://dx.doi.org/10.1186/cc11610>

55 PICC power di vari calibri
Match vena/catetere = protocollo SIP
Sottito 2 trombosi sintomatiche

La trombosi da PICC
in Terapia Intensiva:

inevitabile o prevenibile?

↓ ↓
(NO!) → (riducibile globalmente)

Evidenze

La scelta tra CICC e PICC non va attuata sulla base del rischio trombotico, che comunque si assesta intorno al 1 - 5 % per entrambi i VAD.

Benché i PICC siano particolarmente a rischio per trombosi (vene piccole – cateteri lunghi – frequenti malposizioni), utilizzando un adeguato protocollo di inserzione è possibile minimizzare tale rischio.

Evidenze

Il rischio trombotico è maggiore nei pazienti oncologici

La presenza di una paresi/plegia è un fattore di rischio per trombosi (muscoli ipotrofici, vene ipoplasiche, stasi venosa)

L'utilizzo di PICC di lungo calibro può essere un fattore di rischio, a meno che non si scelga una vena di calibro appropriato

La scelta del lato e la scelta della vena rappresentano un passaggio essenziale per un impianto efficace e a basso rischio di complicanze

Procedure standardizzate (protocolli)

Conclusioni (1)

1. Numerosi fattori concorrono alla formazione di trombosi CVC correlata nei pazienti portatori di PICC, con un peso diverso, non sempre noto o calcolabile.
2. Ruolo e significato diverso delle tromboflebiti superficiali (sintomatiche) rispetto alle trombosi profonde (sintomatiche ma anche asintomatiche).
3. Probabilmente esistono fattori che si potenziano vicendevolmente nei pazienti in TI.

Conclusioni (2)

4. Non per tutti i soggetti in TI esiste un vantaggio al posizionamento di PICC rispetto al CICC.
5. La valutazione dei fattori di rischio trombotico nei pazienti in TI candidati al posizionamento di PICC tende a prevenire l'insorgenza di Trombosi CVC correlata mediante
 - corretta indicazione
 - sceita appropriata del dispositivo
 - realizzazione di protocolli operativiatti ad incidere positivamente sul determinismo del processo trombotico, condizionando così una riduzione dell'incidenza globale dei fenomeni stessi.
6. Allo stato attuale sono auspicabili ulteriori studi RTC ben progettati