



XVIII PICC Day

Diagnosi corretta della trombosi venosa da PICC

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IRCCS CRO

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REGIONE AUTONOMA FRIULI VENEZIA GIULIA



Confusione terminologica

Confusione diagnostica

Diagnosi di CRT e ruolo dell'ecografia

CRT Vs guaina fibroblastica

CRT asintomatica

Confusione terminologica



- Nella letteratura anglosassone, si parla di '*thrombotic occlusion*' dei dispositivi vascolari
- In realtà, TROMBO (THROMBUS) e COAGULO (CLOT, or COAGULUM) sono cose ben diverse

Quindi, la CRT e l'occlusione del catetere da coaguli sono complicanze completamente diverse in termini di prevenzione e trattamento

Confusione diagnostica

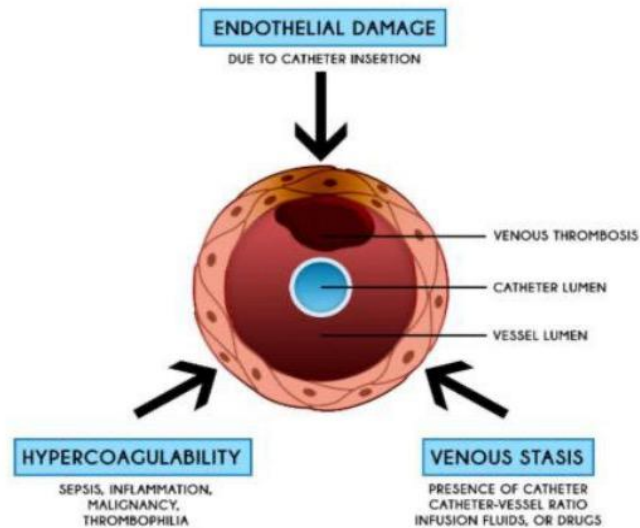
- La guaina fibroblastica o '*fibroblastic sleeve*' (nota con il nome inappropriato di 'guaina di fibrina' o '*fibrin sleeve*') viene oggi SISTEMATICAMENTE scambiata per CRT asintomatica da parte di radiologi, angiologi, ecografisti, chirurghi vascolari.
- Ciò comporta una sovraindicazione inaccettabile a trattamenti antitrombotici

La guaina fibroblastica è un fenomeno fisiopatologico inevitabile (e innocuo) in qualunque dispositivo per accesso venoso, presente nel 100% dei casi e visibile ecograficamente nel 30-40%

Trombosi venosa catetere correlata

Primum movens

Lesione Endoteliale
CHIMICA o MECCANICA



Fattori di rischio
inerenti al PAZIENTE

Fattori di rischio
inerenti al CATETERE



Rudolf Virchow, 1902, the year of his
death at the age of 81

bjh historical review

Virchow and his triad: a question of attribution

Catherine N. Bagot and Roopen Arya
Department of Haematology, King's College Hospital, London, UK



La CRT è intrinsecamente legata a un
danno endoteliale

Evento inevitabile dopo l'inserimento
di un catetere venoso

Trombosi venosa catetere correlata



RACCOMANDAZIONI GAVeCeLT 2024
PER LA INDICAZIONE, L'IMPIANTO E LA GESTIONE
DEI DISPOSITIVI PER ACCESSO VENOSO

trombosi venosa 'periferica' o meglio 'prossimale', cioè in prossimità dell'ingresso del catetere nella vena: ovvero, nel tratto basilico-brachiale-ascellare nel caso dei PICC oppure in prossimità del *carrefour* giugulare-succlavia-anonima nel caso dei cateteri inseriti nelle vene della regione sotto/sopraclaveare (CICC) oppure nel tratto femorale-iliaco nel caso dei FICC. Questo tipo di trombosi può essere occludente o non occludente il vaso, e riconosce la sua eziopatogenesi nel trauma endoteliale nel punto di incannulazione venosa o in una sperequazione tra diametro della vena incannulata e diametro del catetere (se il catetere infatti occupa più di un terzo del diametro della vena, il flusso ematico si riduce e il rischio di trombosi aumenta). La presenza di una trombosi di questo tipo normalmente non interferisce con l'utilizzo del catetere, che può essere lasciato in sede iniziando ovviamente un appropriato trattamento anticoagulante, ad esempio con eparina bpm a dosaggio terapeutico.

Trombosi venosa catetere correlata



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trombosi venosa 'centrale' o meglio 'distale' (ovvero in prossimità della punta del catetere); questo tipo di trombosi – nel caso dei CICC e dei PICC – coinvolge tipicamente la vena cava superiore e/o le vene anonime; la eziopatogenesi risiede spesso in una posizione centrale non ideale (ad esempio, quando la punta è troppo lontana dalla giunzione cavo-atriale e/o si trova in diretto contatto con la parete venosa, provocando un danno meccanico e/o chimico). Quando è occlusiva, può provocare una sindrome della cava superiore. La trombosi venosa in prossimità della punta del catetere spesso si associa a malfunzionamento; è bene però non rimuovere immediatamente il dispositivo, ma solo dopo un adeguato periodo di trattamento anticoagulante a dosaggio terapeutico.

Trombosi venosa catetere correlata



Manifestazioni cliniche



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PMCID: PMC9940014

PMID: [36814508](https://pubmed.ncbi.nlm.nih.gov/36814508/)

Prevention and treatment of catheter-related venous thrombosis in long-term parenteral nutrition: A SINuC position statement

Vincenzo Zaccone,¹ Luca Santoro,^{2,*} Emanuele Guerrieri,³ Ilaria Diblasi,³ Ilaria Roncarati,³ Giovanna Viticchi,⁴ Pietro Vecchiarelli,⁵ Angelo Santoliquido,^{2,6} Francesca Fiore,⁷ Alessio Mollino,⁸ Francesco Landi,^{6,7} Gianluca Moroncini,⁹ Antonio Gasbarrini,^{6,10} Maurizio Muscaritoli,⁸ and Lorenzo Falsetti¹, SINuC†

Half of the CRT cases are asymptomatic

The most frequent signs and symptoms observed in CRT are edema, erythema, pain, discomfort, and weakness of the affected limb, while the presence of superficial venous circles is uncommon

If the thrombosis involves the anonymous vein or the superior vena cava, symptoms could also affect the neck and face with associated headache and drowsiness until the development of superior vena cava syndrome.

CRT can be clinically evident only with venous catheter malfunction that occurs when the catheter tip is mispositioned

Trombosi venosa catetere correlata



Diagnosi

D-Dimero: utile per escludere la diagnosi -
elevata sensibilità (92–100%) e alto valore
predittivo negativo. Bassa specificità.



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ECOGRAFIA



Trombosi venosa catetere correlata

Diagnosi

Particolarmente facile nei PICC, le vene degli arti sono facilmente esplorabili



ECOGRAFIA



Trombosi venosa catetere correlata

Diagnosi



ECOGRAFIA - vantaggi

- L'ecografia consente di visualizzare catetere, parete vasale e immagini intravascolari con minimo costo, minima invasività, con semplice manovra 'bedside'. Consente la differenziazione tra CRT e FS sulla base della ecogenicità e della morfologia.
- Nel neonato e nel bambino è possibile la visualizzazione di qualunque vena percorsa dal catetere (anche se nell'adulto vi sono alcune aree 'mute': VCS, tratto di VCI sotto le renali, vene iliache comuni)

Trombosi venosa catetere correlata



Diagnosi

ECOGRAFIA - *svantaggi*

La disponibilità immediata di sonde ecografiche 'bedside' e la non-invasività della manovra inducono ad esami ecografici periodici non giustificati in pazienti asintomatici, con conseguenze negative:

- Diagnosi accidentale di CRT asintomatica 'vera', il che spesso comporta trattamenti di dubbia indicazione, che altrimenti non sarebbero stati presi in considerazione
- Diagnosi accidentale di FS, che viene sistematicamente scambiata per CRT asintomatica, il che comporta trattamenti inappropriati

CRT vs guaina fibroblastica



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guaina fibroblastica (c.d. *fibrin sleeve*): si presenta ecograficamente come un manicotto posizionato intorno alle pareti esterne del catetere, in qualsiasi punto del suo decorso; tipicamente, non è aderente alle pareti dell'endotelio ma può rivestire il catetere per tutta la sua lunghezza, interferendone con il funzionamento (ciò avveniva particolarmente con i cateteri valvolati a punta chiusa, oramai in disuso); alla rimozione del catetere, spesso può essere ancora apprezzata ecograficamente mentre fluttua dentro al lume della vena. Non comporta rischi di embolia polmonare. Trattandosi di un tessuto connettivale, non è sensibile ai trombolitici.

CRT vs guaina fibroblastica

È un fenomeno fisiopatologico innocuo,
inevitabile per qualsiasi accesso venoso

Si tratta della «reazione da corpo estraneo» del
sangue nei confronti di qualsiasi oggetto inerte
che sia immerso nel torrente circolatorio per
un tempo sufficiente

1

Rischio di malfunzione del catetere (se
coinvolge la punta): **EVENTO RARO**

2

Rischio di difficoltà alla rimozione del
catetere: **EVENTO MOLTO RARO**

3

Rischio che la guaina sia scambiata per una
trombosi: **EVENTO MOLTO FREQUENTE**

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CRT vs guaina fibroblastica

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Table 1. Main studies on fibroblastic sleeve.

Author	Term	Type of article	Model	Type of VAD
Motin et al. ¹	"Fibrin sleeve" (article in French)	Postmortem study	Human	Polyethylene catheters
Hoshal et al. ²	Fibrin sleeve	Postmortem study	Human	Catheters in different materials: polyethylene, Teflon, nylon, silicon, heparin-bonded polyethylene, graphite-benzalkonium chloride-heparin-bonded polyethylene
Peters et al. ³	Fibrin sheath	—	—	—
Borow et al. ⁴	Fibrin sheath	Experimental study	Dog	Catheters in different materials: hydromer-coated polyurethane, heparin hydromer-coated polyurethane, polyvinylchloride, silicon, Teflon, polyurethane
Lloyd et al. ⁵	Fibrinous sheath	Experimental study	Rat	Silicon catheter
Hombrouckx et al. ⁶	Fibrin sheet	Clinical study	Human	Dialysis catheters: 12-Fr silicon and 8-Fr polyurethane
Raad et al. ⁷	Thrombin sheath	Postmortem study	Human	Non-tunneled catheters in polyurethane or silicon.
Cardella et al. ⁸	Fibrous sheath	Case report	Human	3-Fr single-lumen silicon PICC
O'Farrell et al. ⁹	Fibrin sheath	Experimental study	Rat	Silicon catheters
Crain et al. ¹⁰	Fibrin sheath	Pictorial essay	Human	Double-lumen dialysis catheter; Hickman-type single-lumen catheter
Xiang et al. ¹¹	Catheter sleeve	Experimental study	Rat	Silicon catheters

Xiang et al. ¹²	Catheter sleeve + sleeve-related thrombosis	Experimental study	Rabbit	4.2-Fr Broviac single-lumen catheters
Mehall et al. ¹³	Fibrin sheath	Experimental protocol	Rat	2.7-Fr silicon catheters
Oguzkurt et al. ¹⁴	Peri-catheter sleeve	Prospective study	Human	11.5-Fr polyurethane dialysis catheters
Keller et al. ¹⁵	Peri-catheter sheath	Experimental study	Rat	2.7-Fr silicon catheters
Forauer et al. ¹⁶	Catheter-related (fibrin) sheath	Experimental study	Swine	6.6-Fr single-lumen silicon catheters; 7-Fr dual-lumen silicon catheters
Sabbaghian et al. ¹⁷	Catheter "cast"	Case report	Human	9.6-Fr implantable port
Sinno and Alam ¹⁸	Fibrinous sheath/catheter related sheath/fibrin sheath	Case report	Human	Cuffed tunneled catheters; implantable ports
Percarpio et al. ¹⁹	Catheter-related sheath (CRS)	Book chapter	—	—
Krausz et al. ²⁰	Fibrin sheath	Retrospective study	Human	Tunneled catheters; implantable ports; PICCs
Boddi et al. ²¹	Fibrin sheath	Prospective study	Human	Implantable ports
Sylvia et al. ²²	Fibroblastic sleeve	Experimental study	Ovine	Polyurethane catheters with different coating: chlorhexidine, fluoro-oligomers, poly(2-methoxy-ethyl acrylate)
Tanabe et al. ²³	Catheter sleeve	Experimental study	Rabbit	Poly(2-methoxy-ethyl acrylate) catheter
Baciarello et al. ²⁴	Fibroblastic sheath	Case report	Human	6-Fr implantable ports
Hill et al. ²⁵	Central venous access device-related sheaths	Prospective study	Human	Implantable ports

CRT vs guaina fibroblastica

Current definition and pathogenesis

The FS is an adequate though imperfect term for describing the connective tissue that envelops the VAD in its intravascular tract; it can be regarded as a kind of “foreign body” reaction of the blood tissue, caused by the presence of the catheter, and it probably occurs in most catheters that remain in place for more than 7 days.

The FS develops very quickly, as its formation starts very early, even 24 h after the insertion of the VAD and is completed within 2 weeks.^{22,27} Although the fine mechanisms are not perfectly defined, it appears that the external surface of the foreign body (i.e. the catheter) attracts a circulating protein—fibronectin—produced by the liver. According to the most credited theory,²⁸ fibronectin attracts blood macrophages, which stick to the catheter and differentiate into smooth muscle cells and fibroblasts, starting the production of collagen, creating a connective tissue that slowly enwraps the catheter.

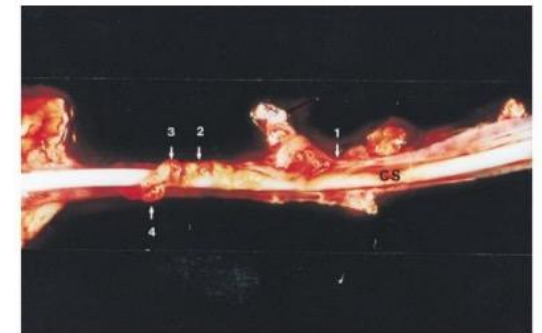
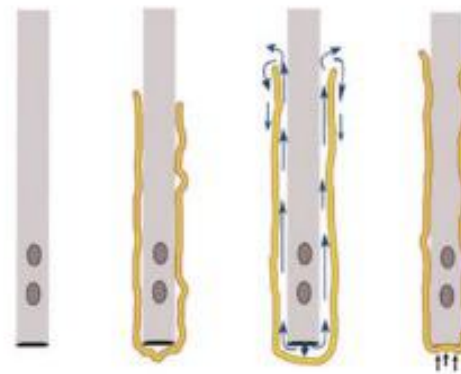
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Xiang et al. / *Thromb. Res.* 2001



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Manifestazioni cliniche



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Fenomeno fisiopatologico solitamente innocuo

PWO - persistent withdrawal occlusion

PWO – persistent withdrawal occlusion

1

Pinch-off syndrome

2

Malposizione

3

Valvola di Groshong

4

CRT che coinvolge la punta del
catetere

5

Coagulo nel catetere in prossimità
della punta

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Diagnosi

Venografia

Crain MR, Horton MG and Mewissen MW. Fibrin sheaths complicating central venous catheters. *AJR Am J Roentgenol* 1998; 171(2): 341-346

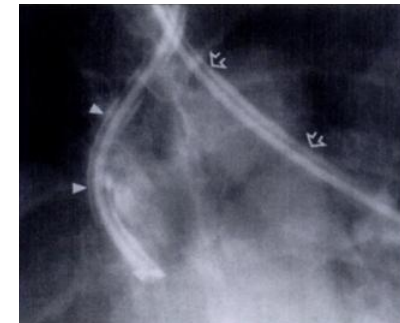


Immagine «a doppio contorno»

Fisher KL and Leung AN. Radiographic appearance of central venous catheters. *AJR Am J Roentgenol* 1996; 166(2): 329-337.

ECOGRAFIA



Valutare il catetere lungo tutto il tratto vascolare che può essere esplorato mediante ultrasuoni

CRT vs guaina fibroblastica

Diagnosi

“Trombosi peri-catetere”



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strato sottile (>1mm) di materiale ecogeno
localizzato tutt'intorno alla parete del catetere,
come una sorta di manica, con superficie regolare e
poca o nessuna relazione con la parete della vena

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Table 3. Main differences between catheter-related thrombosis (CRT) and fibroblastic sleeve (FS).

	CRT	FS
Etiopathogenesis	Endothelial damage	Foreign body reaction
Molecular trigger	Tissue thromboplastin	Fibronectin
Type of tissue	Thrombus	Connective tissue

CRT vs guaina fibroblastica

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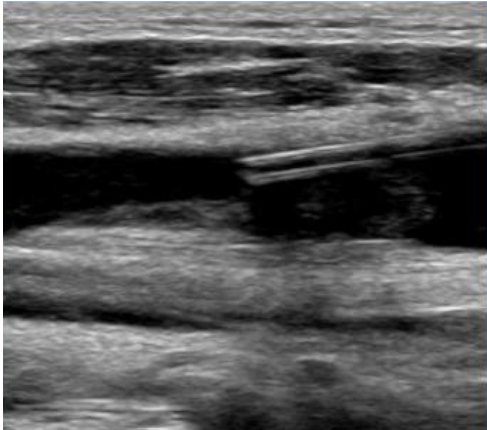
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Table 3. Main differences between catheter-related thrombosis (CRT) and fibroblastic sleeve (FS).

	CRT	FS
Location	At the site of vein wall damage	Around the catheter
		

CRT vs guaina fibroblastica

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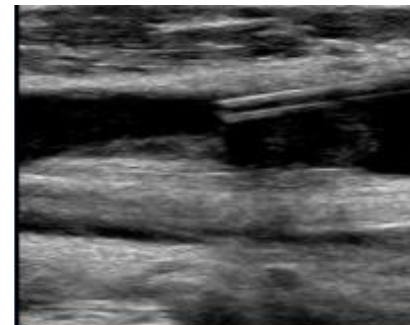
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Contatto con la parete venosa

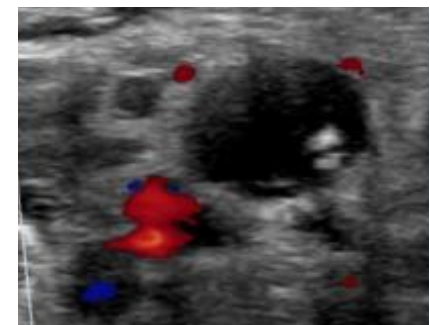
TROMBOSI CATETERE
CORRELATA

PARZIALE



TROMBOSI MURALE
NON OSTRUTTIVA

TOTALE



TROMBOSI MURALE
OSTRUTTIVA

CRT vs guaina fibroblastica

Contatto con la parete venosa

GUAINA FIBROBLASTICA

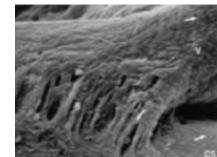
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NESSUNO



PONTI VENOSI



Xiang DZ, et al. Composition and formation of the sleeve enveloping a central venous catheter.
J Vasc Surg 1998; 28(2): 260-271

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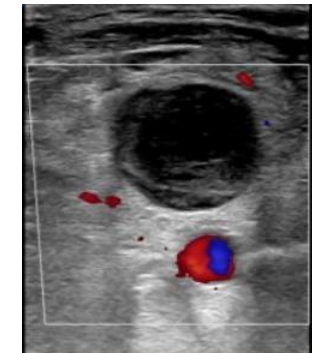
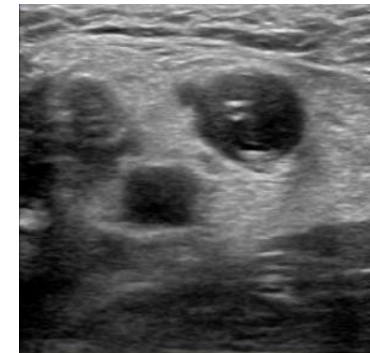
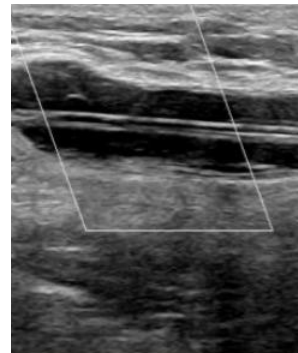
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Dimensione

TROMBOSI CATETERE
CORRELATA



SPESSORE: variabile, se occlusiva può determinare espansione della vena
ESTENSIONE LONGITUDINALE: da pochi mm a tutta la lunghezza dell'asse venoso

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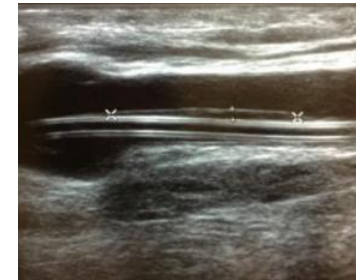
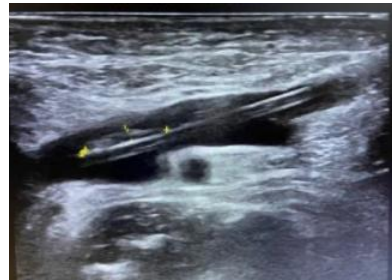
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Dimensione

GUAINA FIBROBLASTICA



SPESSORE: 1-3 mm

ESTENSIONE LONGITUDINALE: da pochi mm a tutta la lunghezza del catetere

CRT vs guaina fibroblastica

Review

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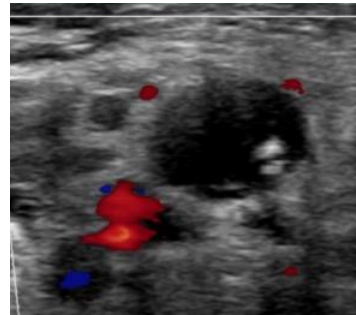
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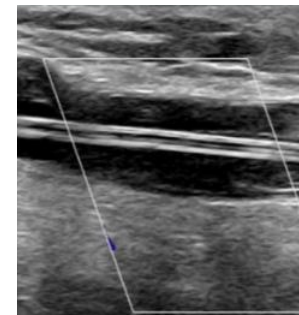


Ecogenicità

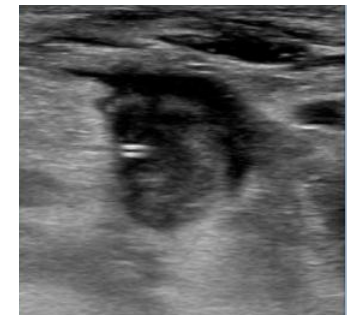
TROMBOSI CATETERE
CORRELATA



Anecogeno



Echi sottili



Ecogeno

Giorni



Settimane

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Review

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Giovanna Passaro , Mauro Pittiruti  and Antonio La Greca

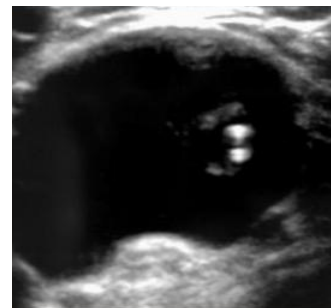
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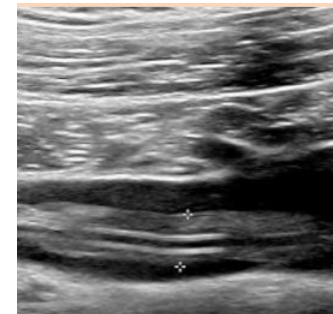



Ecogenicità

GUAINA FIBROBLASTICA



Ipoecogeno



Ecogena



Iperecogena



CRT vs guaina fibroblastica

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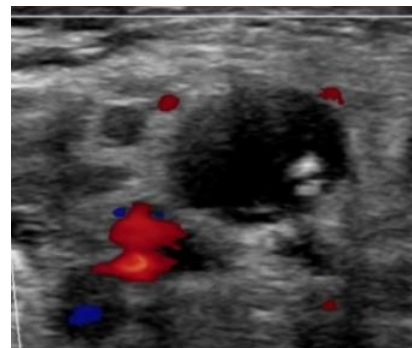
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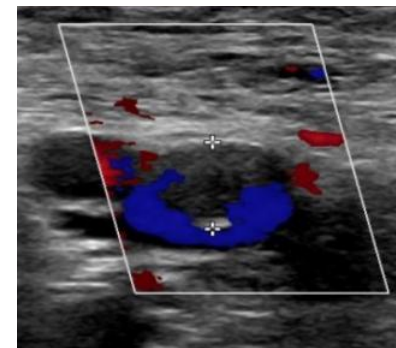

Ecogenicità – ecocolor doppler

TROMBOSI CATETERE
CORRELATA

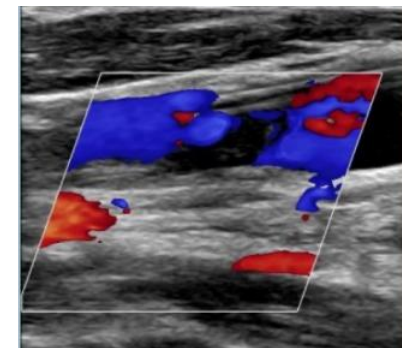
assenza di riempimento da parte del
colore della vena occlusa



Trombosi ostruttive:
assenza totale



Trombosi non ostruttive: assenza
parziale



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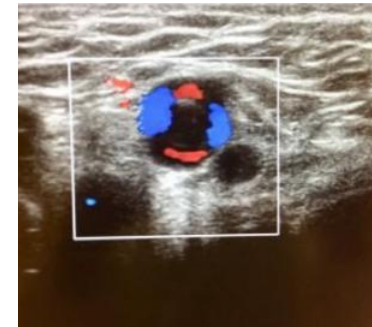
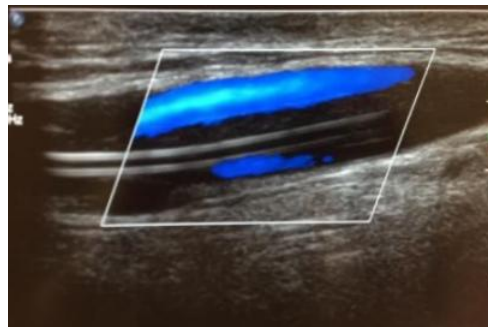
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Ecogenicità – ecocolor doppler

Utile in caso di guaine ipoecogene, disposizione del
color tipica tra guaina e parete venosa

GUAINA FIBROBLASTICA



«RING SIGN»

CRT vs guaina fibroblastica

Review

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Table 3. Main differences between catheter-related thrombosis (CRT) and fibroblastic sleeve (FS).

	CRT	FS
Etiopathogenesis	Endothelial damage	Foreign body reaction
Molecular trigger	Tissue thromboplastin	Fibronectin
Type of tissue	Thrombus	Connective tissue
Location	At the site of vein wall damage	Around the catheter
Evolution	Fibrosis/reabsorption	Reabsorption (?)
US imaging	Mass obstructing the vein Anechoic, and then hypo-echoic Mainly attached to the vein wall	Sleeve all around the catheter Hypo- or hyper-echoic Mainly attached to the catheter
Clinical manifestation	Signs and symptoms of venous obstruction + risk of catheter malfunction	Catheter malfunction
Risk of pulmonary embolism	Yes	No
Need for VAD removal	Rare (not responsive to therapy)	Rare (irreversible catheter malfunction)
Preventable with anticoagulants	Yes (not consistently)	No
Sensitive to thrombolysis	Yes (in the initial phase)	No
Pharmacological management	LMW heparin	None

RESEARCH

Open Access

Incidence of asymptomatic catheter-related thrombosis in intensive care unit patients: a prospective cohort study

Chiara Abbruzzese^{1†}, Amedeo Guzzardella^{2†*}, Dario Consonni³, Gloria Turconi², Claudia Bonetti², Matteo Brioni¹, Mauro Panigada¹ and Giacomo Grasselli^{1,2}

52 (14%) out of 375 catheters inserted developed CRT after 5 [3–10] days from insertion.

46 CRTs (88%) were partial thrombosis.

All CRTs remained asymptomatic

Intensive Care Med (2023) 49:401–410
<https://doi.org/10.1007/s00134-023-07006-x>

ORIGINAL

Daily point-of-care ultrasound-assessment of central venous catheter-related thrombosis in critically ill patients: a prospective multicenter study

Chunshuang Wu^{1,2,3}, Mao Zhang^{1,2,3}, Wenjie Gu^{1,2,3}, Caimu Wang⁴, Xudong Zheng⁵, Junfeng Zhang⁶, Xingwen Zhang⁷, Shijin Lv⁸, Xuwei He⁹, Xiaoyuan Shen¹⁰, Wenlong Wei¹¹, Guotao Wang¹², Yingru Lu¹³, Qingli Chen⁹, Renfei Shan¹⁴, Lingcong Wang¹⁵, Feng Wu¹⁶, Ting Shen¹⁷, Xuebo Shao¹⁸, Jiming Cai¹⁹, Fuzheng Tao²⁰, Haiying Cai²¹, Qin Lu^{1,2,3*} on behalf of and the Study Group of Central Venous Catheter-related Thrombosis

The study included 1262 patients. The incidence of CRT was 16,9%

CRT asintomatic Vs guaina fibroblastica

Intensive Care Med (2023) 49:878–879
<https://doi.org/10.1007/s00134-023-07076-x>

CORRESPONDENCE

Catheter-related thrombosis in critically ill patients: a clinical problem or just a matter of definition?

Salvatore L. Cutuli, Antonio M. Dell'Anna*, Simone Carelli, Maria G. Annetta and Massimo Antonelli

CRT vs guaina fibroblastica

Original research article

JVA The Journal of Vascular Access

Incidence of fibroblastic sleeve and of catheter-related venous thrombosis in peripherally inserted central catheters: A prospective study on oncological and hematological patients

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Carmela Trezza¹, Catello Califano², Vincenzo Iovino³,
Carmela D'Ambrosio¹, Giuseppe Grimaldi⁴ and Mauro Pittiruti⁵ 



Results: We enrolled 254 patients with power injectable polyurethane 4Fr peripherally inserted central catheters. Ultrasound scan of the veins of the arm showed fibroblastic sleeve in 76 patients (29.9%); the fibroblastic sleeve was first detected on day 7 in 45 cases (17.7%), on day 14 in 26 cases (10.2%), on day 21 in 3 cases (1.2%), and on day 28 in 2 cases (0.79%). There was no correlation between the type of disease and the development of fibroblastic sleeve. The incidence of asymptomatic catheter-related thrombosis was 5.12%: all catheter-related thromboses were detected before day 14. There was only one case of symptomatic catheter-related thrombosis (0.39%) in a leukemia patient. Fibroblastic sleeve and catheter-related thrombosis were associated only in two cases (0.78%).

CRT *asintomatica*

Editorial

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Catheter-related thrombosis natural history in adult patients: a tale of controversies, misconceptions, and fears

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Fulvio Pinelli and Paolo Balsorano 



Majority of CRTs within 2 or 3
weeks from catheter insertion

Approximately 1/4
symptomatic events

Uncommon major events after
treatment

CRT Natural History

Approximately 3/4
asymptomatic events

Low potential for long term
sequelae without treatment

CRT asintomatica

1. First clinical scenario: PICC with diagnosed or suspected symptomatic CRT (Figure 1).

- If there are local signs of symptoms suggesting CRT, an ultrasound scan of all veins of the arm and of the infra/supraclavicular area should be performed (following the RaPeVA protocol²⁷).
- If CRT is not confirmed, the PICC can be removed/replaced safely (though the ultrasound diagnosis of a FS might be a relative contraindication to PICC replacement over guidewire).
- If the presence of CRT is confirmed, it should be treated as recommended by current guidelines,^{16,36} with immediate start of antithrombotic treatment at full dosage (for example, LMWH 100 units/kg/12 h). A recent paper³⁷ add some evidence about a lower dosage of heparin (50% reduced dose of LMWH (100 U/kg/day) or fondaparinux (5 mg/day) in patients with a platelet count between $50 \times 10^9/L$ and $30 \times 10^9/L$. Though the length of treatment is not accurately defined (ranging from 72 h to 7 days), clinical judgment suggests that an early removal (3 days) may be safe in the following situations:

- a. Rapid regression of the symptoms after 24–48 h of treatment
 - b. CRT localized to the veins of the arm
 - c. Diagnosed or suspected PICC-related infection
- On the contrary, the extension of the CRT to the thoracic tract of the axillary vein, to the subclavian vein or to the brachio-cephalic vein (and/or presence of a thrombus fluctuating inside the vein) should suggest at least 7 days of antithrombotic treatment before removal.

Editorial

Should ultrasound evaluation for catheter-related thrombosis always be required before PICC removal?

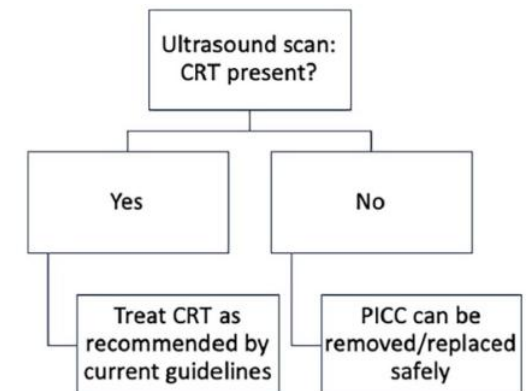
Fulvio Pinelli¹ , Mirko Muzzi²  and Mauro Pittiruti³ 

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A few common sense-based recommendations



CRT asintomatica

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Editorial

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Fulvio Pinelli¹, Mirko Muzzi² and Mauro Pittiruti³

A few common sense-based recommendations

2. Second clinical scenario: no signs or symptoms suggesting CRT (Figure 2).

It is assumed that the PICC may have or not have an asymptomatic CRT.

- a. Reasons for not performing a routine ultrasound scan before PICC removal include:
 - i. Non-hospitalized patients (home care, nursing homes, etc.);
 - ii. PICC inserted more than 2–3 weeks before.²⁶ As CRT usually occurs in the first 2 weeks after insertion,¹⁰ even if a thrombus has developed, it might be stable and not prone to be mobilized during PICC removal;
 - iii. Patient is treated with anticoagulant: heparin, vitamin K antagonists (warfarin, acecumamol) or DOAC/NOAC (Apixaban, Dabigatran, Edoxaban, and Rivaroxaban);

In all these situations, pre-removal ultrasound scan may not be cost-effective, considering the very low risk of an asymptomatic CRT and the extremely low risk that it may be associated with PE, weighed against the logistic inconvenience of performing the maneuver.

- b. An ultrasound scan should be considered before removal in the following situations:
 - i. PICC inserted less than 2–3 weeks before: in this case, if a thrombus has developed, it might be “fresh” and prone to be mobilized during PICC removal;
 - ii. PICC removal performed by the vascular access team (specifically trained to use ultrasound);
 - iii. PICC in hospitalized patients, particularly in intensive care units or in non-intensive oncological wards;
 - iv. High risk patients (critically ill, history of previous thrombosis, hematological disease, COVID-19,³⁸ renal failure).³⁹

In all the above situations, pre-removal ultrasound scan may be safer and cost-effective, considering the significant risk of the presence of asymptomatic CRT and the minimal logistic burden of performing the ultrasound evaluation.

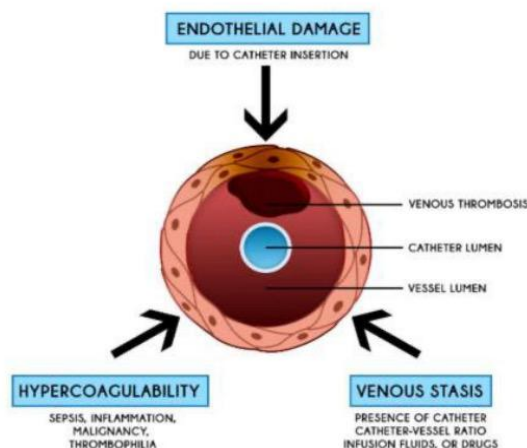
- c. If an asymptomatic CRT is diagnosed, though the evidence is scarce, it would seem safe to remove the PICC after at least 72 h of antithrombotic treatment. Maximal attention should be adopted in differentiating the FS from asymptomatic CRT, since FS is an innocuous phenomenon, never associated with risk of PE, and it does not require any treatment.²⁵ On the other hand, the ultrasound detection of a FS may be a contraindication to guidewire replacement.

Trombosi venosa catetere correlata

Conclusioni

La CRT è una complicanza frequente, ma che nella maggior parte dei casi:

- ha evoluzione benigna
- risponde rapidamente al trattamento
- non si associa ad elevati costi assistenziali
- non si associa a rischi gravi per il paziente
- non comporta la interruzione dell'utilizzo del dispositivo

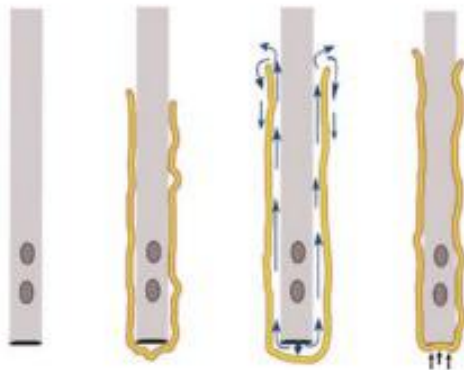


Il rischio di CRT ha una componente non prevenibile (legati al paziente) e una componente prevenibile (tecnica di impianto)

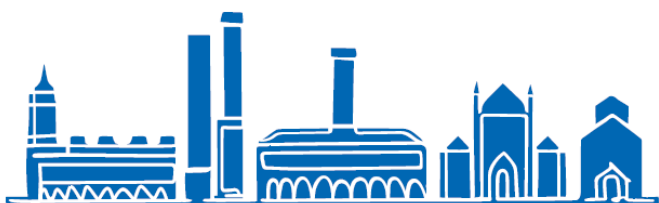
Guaina fibroblastica

Conclusioni

Necessità di educazione/formazione per tutti gli operatori sanitari interessati, per renderli consapevoli della esistenza della guaina fibroblastica.



Rischio frequente di prescrizioni di terapie antitrombotiche inutili e pericolose per immagini intravascolari in realtà riferibili a guaina fibroblastica.



PICC DAY 2025 BOLOGNA

Conclusioni

1

Eseguire eco-color-doppler **soltanto se il paziente ha segni o sintomi** sospetti per CRT

2

Conoscere la **diagnosi differenziale ecografica tra CRT e FS**

3

Ricorrere a esame TC con mdc soltanto in casi molto particolari, nel paziente adulto

4

Porre indicazione al **trattamento**

Mai – in caso di FS

Sempre – in caso di CRT sintomatica

In pazienti selezionati – in caso di CRT asintomatica



Grazie per
l'attenzione



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SOC Anestesia e Rianimazione
Team Accessi Vascolari

