

Come comportarsi con il catetere incastrato e/o embolizzato

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QUANDO RIMUOVERE IL SISTEMA A LUNGO TERMINE

- Complicanza infettiva con indicazione alla rimozione
- Complicanza trombotica con indicazione alla rimozione
- Danno meccanico non riparabile
- Fine uso
- Volontà del paziente



Complicanza INFETTIVA

- DEFINIZIONE
 - Infezione EXIT SITE
 - Infezione TUNNEL
 - Infezione TASCA Port
 - Sepsi/CRBSI





Complicanza TROMBOTICA

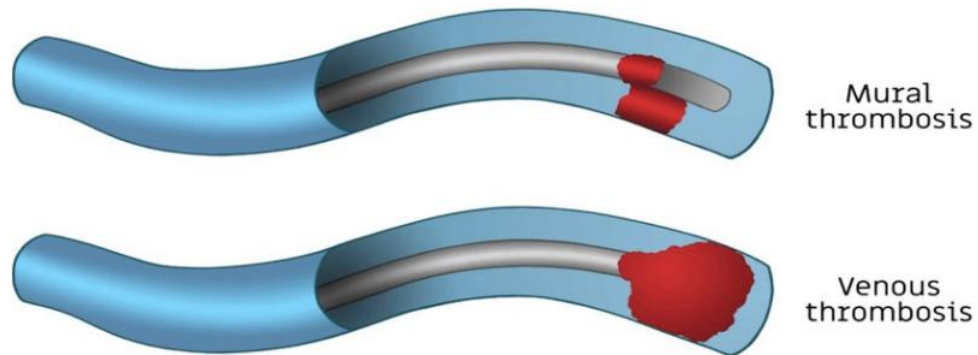
OCCLUSIONE:

- PARZIALE: è possibile infondere ma il CVC non refluisce (PWO: persistent withdrawal occlusion)
- COMPLETA: nessun flusso in entrambe le direzioni



TROMBOSI CVC

CORRELATA: trombosi che si sviluppa lungo il decorso o vicino al catetere ma che NON OCCLUDE COMPLETAMENTE IL LUME DEL VASO



TROMBOSI VENOSA

PROFONDA: trombosi che OCCLUDE COMPLETAMENTE IL LUME DEL VASO in cui è presente il CATETERE



Complicanza MECCANICA

- ROTTURA
- DISLOCAZIONE



OK...tutto bellissimo...il catetere VA RIMOSSO



POSSIBILI COMPLICANZE DELLA RIMOZIONE

- ROTTURA DEL CATETERE CON POSSIBILE EMBOLIZZAZIONE DEL FRAMMENTO DISTALE
- RITENZIONE DEL CATETERE NEL VASO



PERCHE' SI VERIFICA?

The mechanism of indwelling catheter adhesion to a vessel wall has been reported to be because of focal areas of endothelial injury in the vein wall, which leads to vein wall thickening and bridge formation from the vein wall to the catheter



Contents lists available at ScienceDirect

Journal of Pediatric Surgery

journal homepage: www.elsevier.com/locate/jped surg



Operative Techniques

Mechanics of a stuck central venous catheter removal

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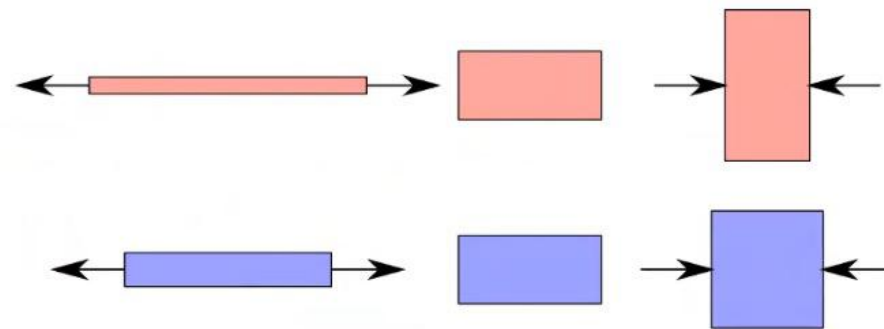
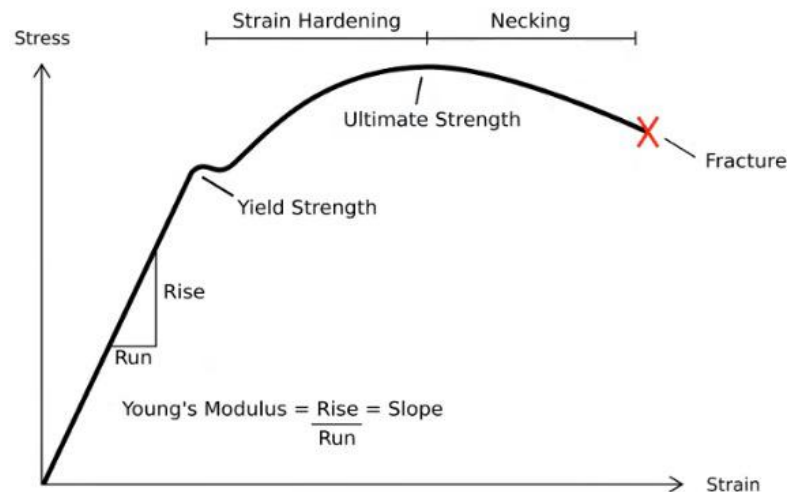


140 gr senza guida
240 gr con guida



PERCHE' SI VERIFICA?

Il **modulo di elasticità** è una grandezza, caratteristica di un materiale, che esprime il rapporto tra tensione e deformazione nel caso di condizioni di carico monoassiale ed in caso di comportamento di tipo "elastico" del materiale. È definito come il rapporto tra lo sforzo applicato e la deformazione che ne deriva



PERCHE' SI VERIFICA?

J Vasc Interv Radiol 2003; 14:1163–1168



After short-term catheter placement, focal areas of endothelial injury were seen in the vein wall adjacent to the catheter. Associated thrombus may or may not be present.

Long-term catheters displayed vein wall thickening and bridges from the vein wall to the catheter. These observations represent a progressive reaction of the human vein wall to access devices.



PERCHE' SI VERIFICA?

Journal of Pediatric Surgery 50 (2015) 1928–1932



Contents lists available at [ScienceDirect](#)

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Histological changes of the unligated vein wall adjacent to the central venous catheter after open cutdown in rats[☆]



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PERCHE' SI VERIFICA?

Risk factors of stuck fragment during totally implantable central venous access ports removal

Jung et al. *BMC Surg* (2021) 21:276
<https://doi.org/10.1186/s12893-021-01271-7>

BMC Surgery

Parameters	Univariate		Multivariate	
	OR (95% CI)	p-value	OR (95% CI)	p-value
Age at TICVAP insertion	0.99 (0.98–1.00)	0.203		
Body weight at TICVAP insertion	0.96 (0.90–1.01)	0.146		
Body weight at TICVAP removal	1.00 (0.96–1.04)	0.841		
Indwell duration of TICVAP	1.12 (1.06–1.25)	0.003	1.13 (1.02–1.37)	0.098
Body weight change during indwell	1.13 (1.05–1.24)	0.003	1.00 (0.83–1.18)	0.969
Platelet count at TICVAP insertion	0.98 (0.96–0.99)	0.005	0.98 (0.95–0.99)	0.048
TICVAP catheter size	1.13 (0.46–2.87)	0.789		
TICVAP catheter material	0.97 (0.21–6.95)	0.972		

CI, confidence interval; TICVAP, totally implantable central venous access port

RESEARCH

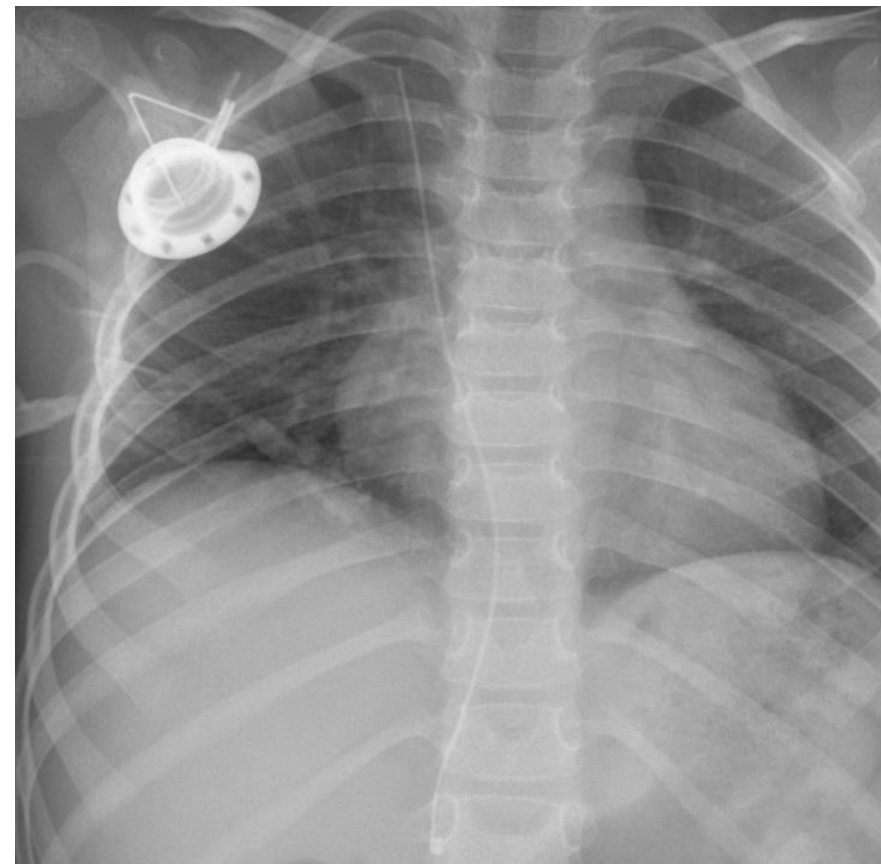
Open Access

Stuck fragment of totally implantable central venous access ports during removal: risk factor analysis in children

We suggest a prophylactic catheter exchange before an indwell duration of **46 months and a body weight change up to 9.9 kg** to prevent a stuck fragment of the catheter. In particular, this suggestion should be considered in children with rapidly growing acute leukemia.



CHE SUCCEDE QUINDI?



CATETERE RITENUTO

...polyurethane catheters are more likely to adhere, compare to a silicone type catheter, to the inner wall of the central vein with surrounding calcification making the catheter nonextractable.

Although a silicone type catheter can also adhere to a vessel wall, they are less reactive in comparison to polyurethane and adhere less.

Silicone catheters, however, are more elastic compare to polyurethane catheters. Because of its elasticity, the silicone catheters tend to fracture more readily than polyurethane catheter



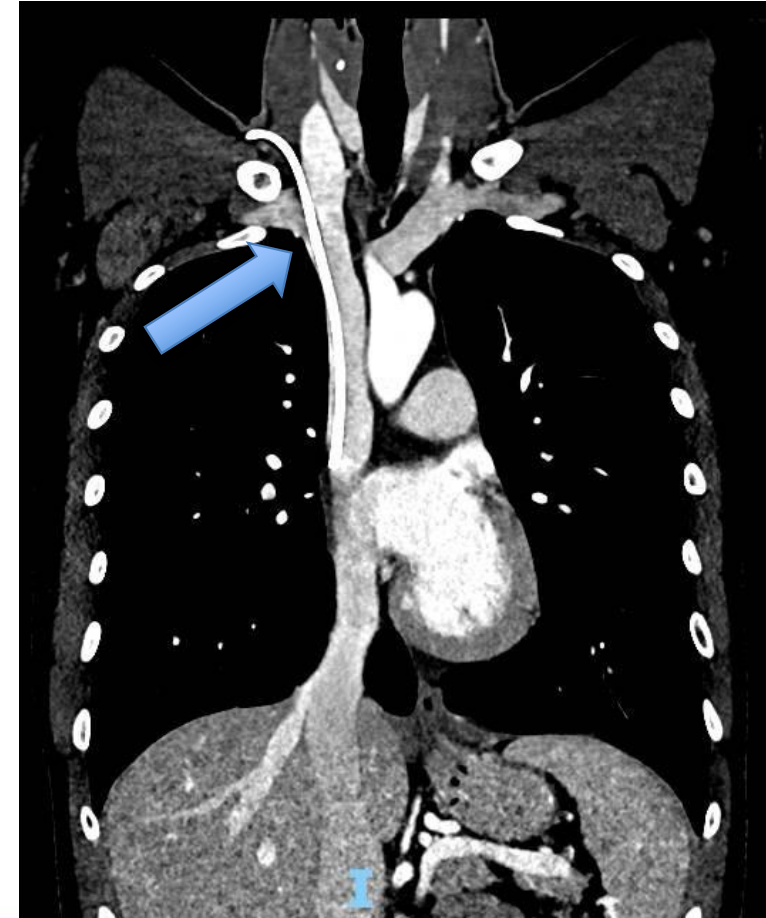
COME SI RISOLVE IL PROBLEMA?

YOU CAN...

1. **...perform venous cutdown of the catheter to the venous entry site** . A venotomy is made to further dissect the catheter as far as possible into the vein.

BUT...

1. **...SOMETIMES IT'S NEITHER EASY NOR POSSIBLE**



COME SI RISOLVE IL PROBLEMA?

YOU CAN...

2. **...abort the operation and schedule an interventional endovascular approach.** This method is usually undertaken when the catheter fractures, and an attempt is made to retrieve the fragment

BUT...

2. ...you need to
 - postpone the procedure,
 - schedule another anesthesia,
 - Call interventional radiologist..



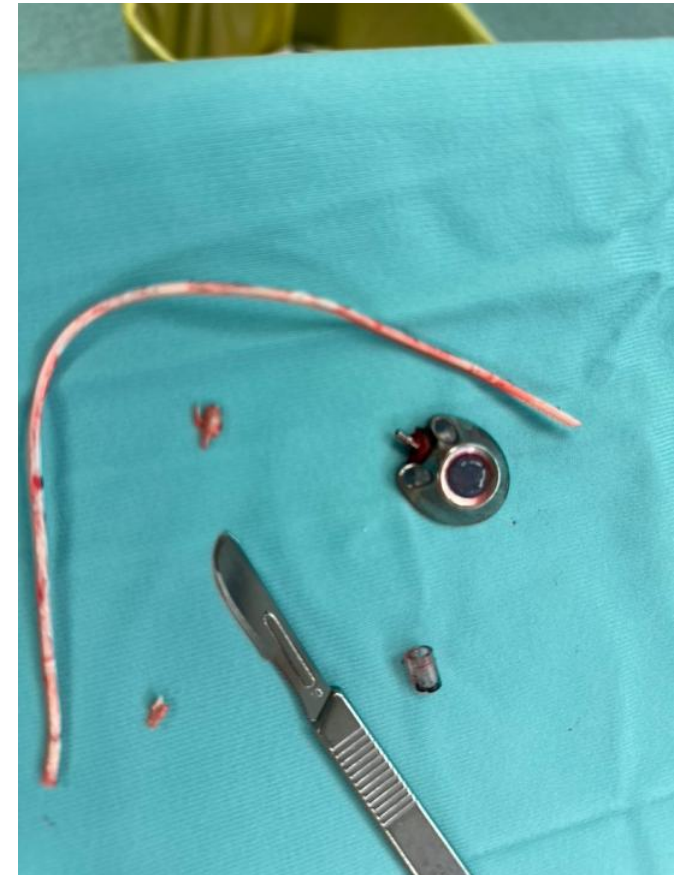
COME SI RISOLVE IL PROBLEMA?

YOU CAN...

3. ...to remove the proximal part of the catheter and suture the distal part of the catheter to the vein to be left permanently in situ.

BUT

3. The long term effect of leaving a catheter fragment in pediatric patients, however, is unknown

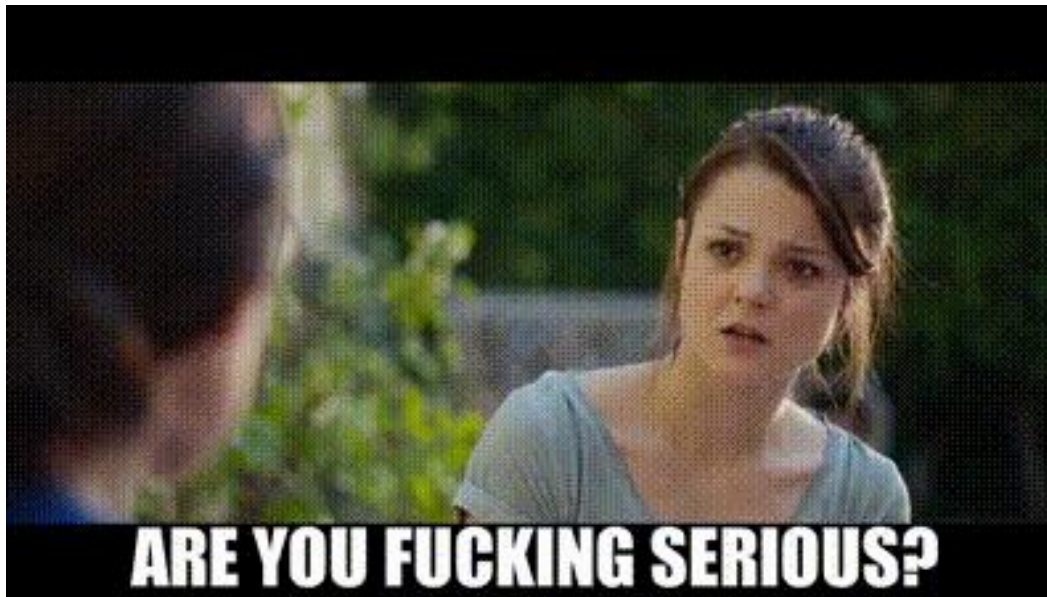


COME SI RISOLVE IL PROBLEMA?

YOU CAN...

4. ...to perform a sternotomy and surgically remove the catheter

BUT...



COME SI RISOLVE IL PROBLEMA?

YOU CAN...

5. place a wire through the stuck catheter lumen and apply a push force to dislodge the catheter from its adhesion.



CATETERE ROTTO ED EMBOLIZZATO

YOU MUST...

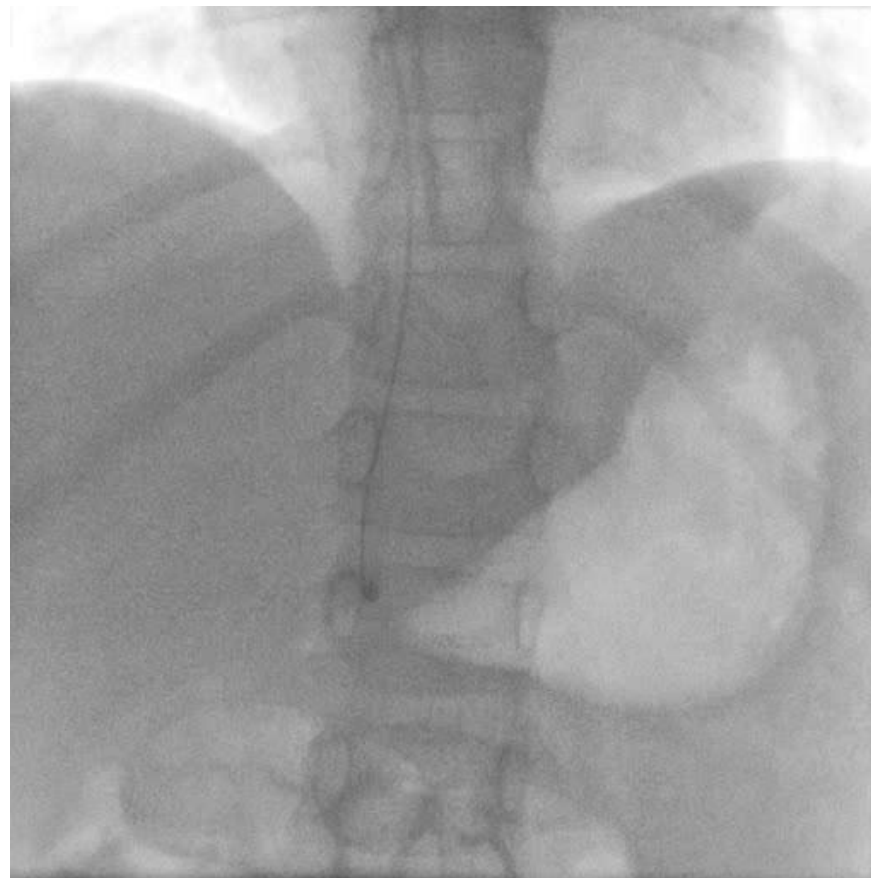
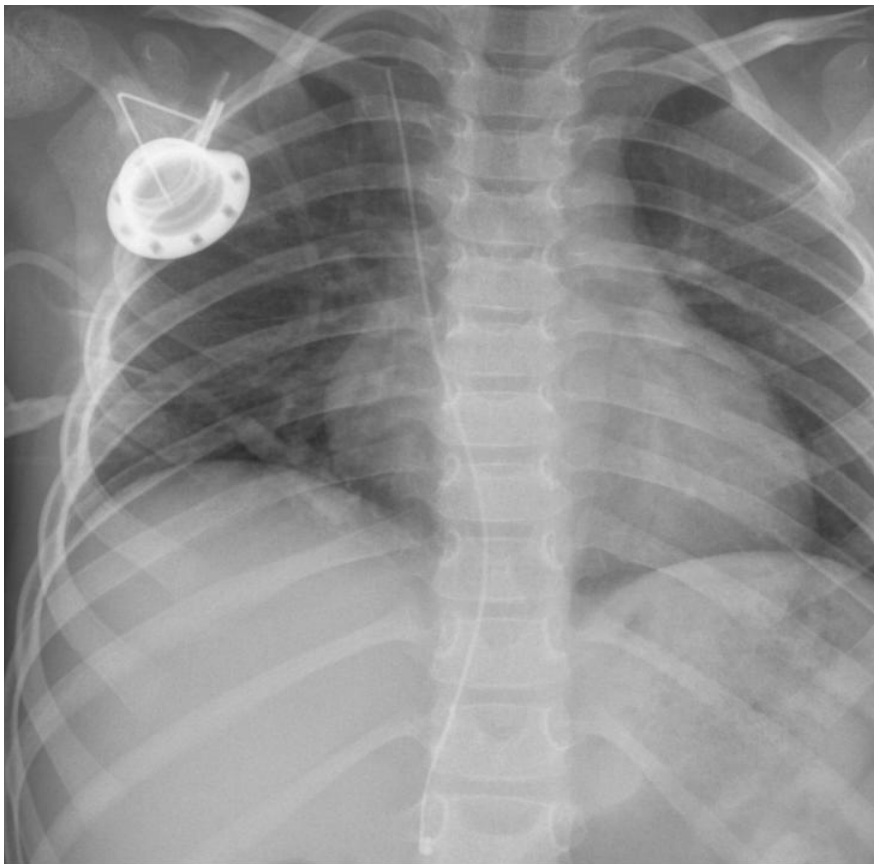
- ...call interventional radiologist in order to attempt endovascular retrieval of the fragment.

BUT...

- ...you need to evaluate
 - Position of the embolized fragment
 - Severity of situation
 - Hepatic vein
 - Subclavian vein
 - Heart!



CATETERE ROTTO ED EMBOLIZZATO



CATETERE ROTTO ED EMBOLIZZATO



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RESEARCH

Open Access

Stuck fragment of totally implantable central venous access ports during removal: risk factor analysis in children



The management of stuck fragment remains controversial, specially in asymptomatic patients.

In these patients, we suggest careful and close observation rather than aggressive and invasive treatment.





If you have any
questions please
keep it for
yourself ...i'm not

Google



GRAZIE PER L'ATTENZIONE

