



VI Convegno Nazionale **GAVePed** 2024 **BOLOGNA**

Come evitare le dislocazioni degli accessi venosi in età neonatale

Vito D'Andrea

Fondazione Policlinico Gemelli

Roma



Dislocazione

- Perdita accesso
- Tip migration (CVO,ECC)
- Sospensione infusionale
- Punture multiple
- Dolore

Il fissaggio ideale

- Ridurre i movimenti dell'accesso vascolare all'interno del vaso (pistoning; "in and out")
- Ridurre i movimenti dell'accesso vascolare all'esterno (mantenendolo nella vena)
- Fornire una barriera alla contaminazione batterica
- Facilitare la traspirazione della cute (alto MVTR specie nel neonato pretermine)
- Prevenire il sanguinamento
- Garantire una chiara e semplice valutazione del sito di inserzione
- Minimizzare il trauma sulla cute
- Essere confortevole
- Poco costoso
- Facile da applicare

36. VASCULAR ACCESS DEVICE SECUREMENT

KEY DEFINITIONS

Adhesive securement device (ASD): an adhesive-backed device that adheres to the skin with a mechanism to hold the vascular access device (VAD) in place; a separate dressing is placed over the ASD. Both the dressing and ASD must be removed and replaced at specific intervals during the VAD dwell time.

Integrated securement device (ISD): a device that combines a dressing with securement functions; includes transparent, semipermeable window, and a bordered fabric collar with built-in securement technology.

Subcutaneous anchor securement system (SASS): a securement device that anchors the VAD in place via flexible feet/posts that are placed just beneath the skin; these act to stabilize the catheter right at the point of insertion. A separate dressing is placed over the SASS. The SASS does not need to be changed at regular intervals when the dressing is changed; it can remain in place if there are no associated complications.

Tissue adhesive (TA): a medical-grade cyanoacrylate glue that can seal the insertion site and temporarily bond the catheter to the skin at the point of insertion and under the catheter hub. Depending on the chemical makeup, TA may be reapplied at each dressing change. Various formulations of TA for wound closure are commercially available, including first generation *N*-Butyl-2-cyanoacrylate (quick drying, rigid/brittle), second generation 2-octyl-cyanoacrylate (longer dry time, more flexible) and *N*-Butyl-2octyl cyanoacrylate formation (increased tensile strength and flexibility) with an additional indication for vascular access securement. Each TA formulation has varied properties and the clinical decision to use should be based on research outcomes relative to the chosen product.

European recommendations on the proper indication and use of peripheral venous access devices (the ERPIUP consensus): A WoCoVA project

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Mauro Pittiruti¹ , Ton Van Boxtel² , Giancarlo Scoppettuolo¹, Peter Carr³, Evangelos Konstantinou⁴, Gloria Ortiz Miluy⁵, Massimo Lamperti⁶, Godelieve Alice Goossens⁷, Liz Simcock⁸, Christian Dupont⁹, Sheila Inwood¹⁰, Sergio Bertoglio¹¹ , Jackie Nicholson¹², Fulvio Pinelli¹³  and Gilda Pepe¹

Several securement strategies are available, and the most appropriate one should be determined on the basis of the expected duration of the line.¹⁰⁴ “Minimal” securement of a SPC can be ensured by sterile semipermeable transparent dressing only, preferably bordered.¹⁰⁵ A more effective securement for “integrated” SPC and for LPC will be achieved by using a bordered transparent dressing inclusive of a securement system, or by using a standard bordered transparent dressing after application of cyanoacrylate glue at the exit site.^{106,107} Recent evidence shows that both strategies are superior to transparent dress-

A Revolutionary, Proven Solution to Vascular Access Concerns: A Review of the Advantageous Properties and Benefits of Catheter Securement Cyanoacrylate Adhesives

Sheng Zhang, PhD • Bethany S. Lingle, BS • Shannon Phelps, BS

Catheter type	Securement method	Securement strength (N)
BD Autoguard catheter	CSCAs	12.473
	Tegaderm 1683	8.283
	Opsite	3.216
	HubGuard	2.905
	Durapore	3.381
BD Nexiva catheter	CSCAs	13.380
	Tegaderm 9525HP	7.090
	Opsite	1.392
	HubGuard	1.552
	Durapore	1.348
Abbreviations: CSCAs, catheter securement cyanoacrylate adhesives; N, newton.		

Catheter Type	Securement Method	Securement Strength (N)
BD Autoguard catheter	CSCAs + Tegaderm 1683	19.501
	CSCAs + Opsite	15.453
	CSCAs + HubGuard	12.451
	CSCAs + Durapore	12.362
BD Nexiva catheters	CSCAs + Tegaderm 9525HP	14.893
	CSCAs + Opsite	16.000
	CSCAs + HubGuard	10.840
	CSCAs + Durapore	15.035
Abbreviations: CSCAs, catheter securement cyanoacrylate adhesives; N, newton.		

Octyl-butyl-cyanoacrylate glue for securement of peripheral intravenous catheters: A retrospective, observational study in the neonatal population

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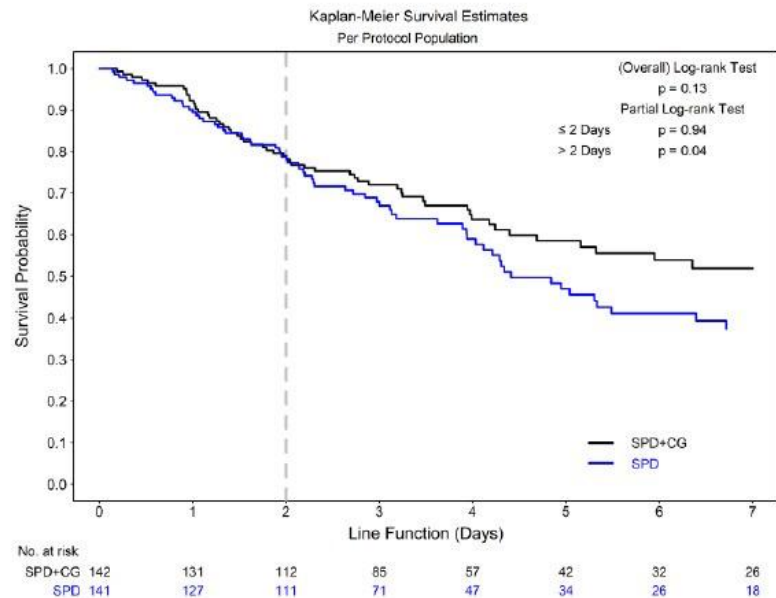
Reason of removal			
Elective	1655 (37)	1919 (49)	<0.001
Accidental	130 (3)	105 (3)	
Leaking	445 (10)	386 (10)	
Occlusion	219 (5)	160 (4)	
Phlebitis	594 (13)	123 (3)	
Infiltration/extravasation	1365 (31)	1121 (29)	<0.001
Lost to follow-up	49 (1)	59 (2)	
Dwell time			
Hours	31.0 ± 24.3	37.1 ± 31.1	

- Riduzione delle flebiti del 77%
- Incremento dell'utilizzo dell'accesso del 20%
- Riduzione della rimozione precoce del 25%

Short peripheral intravenous catheter securement with cyanoacrylate glue compared to conventional dressing: A randomized controlled trial

Amit Bahl , S. Matthew Gibson, David Jankowski and Nai-Wei Chen

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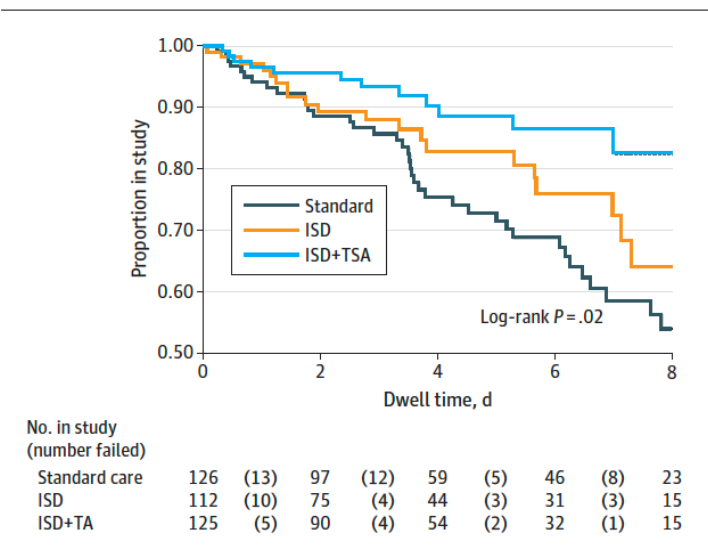
Analysis	Time	Study Group		p-Value
		SPD + CG	SPD	
Intention-to-treat	IV failure (event) [†] , n (%)	55/171 (32.1%)	66/174 (37.9%)	0.065
	Restricted mean survival duration [‡] , days			
	≤2 days (48 h)	1.84	1.83	0.81
	>2 days (48 h)	5.97	5.43	0.05
	Hazard ratio (95% CI) on IV failure [¶]			
Per Protocol	IV failure (event) [†] , n (%)	55/142 (38.7%)	66/141 (46.8%)	0.04
	Restricted mean survival duration [‡] , days			
	≤2 days (48 h)	1.82	1.80	0.71
	>2 days (48 h)	5.97	5.43	0.05
	Hazard ratio (95% CI) on IV failure [¶]			
	≤2 days (48 h)	1.02 (0.60 to 1.71)	1 [reference]	0.95
	>2 days (48 h)	0.57 (0.34 to 0.97)	1 [reference]	0.04

Novel Peripheral Intravenous Catheter Securement for Children and Catheter Failure Reduction

A Randomized Clinical Trial

Brooke Charters, BN; Kelly Foster, MN; Benjamin Lawton, MBBS; Leonard Lee, MN; Joshua Byrnes, PhD; Gabor Mihala, PhD; Corey Cassidy, MBBS (Hons); Jessica Schults, PhD; Tricia M. Kleidon, MNSci (Nurs. Prac.); Ruth McCaffery, BN; Kristy Van, MN; Vanessa Funk, BN; Amanda Ullman, PhD

Figure 2. Kaplan-Meier Curve of the Primary Outcome by Study Groups



X-axis truncated at 8 days due to relatively low numbers at risk. ISD indicates integrated securement device; TA, tissue adhesive

	No. of nonmissing observations	Standard care	ISD	ISD and TA
Complications for secondary outcome, No. (%)				
Any type	363	43 (34)	24 (21)	15 (12)
Unintentional dislodgement	363	15 (12)	11 (10)	1 (1)
Occlusion	363	11 (9)	2 (2)	6 (5)
Infiltration	363	8 (6.)	4 (4)	3 (2)
Partial dislodgement	363	2 (2)	2 (2)	2 (2)
Extravasation	363	4 (3)	2 (2)	0
Device leaking	363	2 (2)	2 (2)	0
Phlebitis	363	0	1 (1)	2 (2)
Too painful to tolerate	363	1 (1)	0	1 (1)

Peripheral intravenous cannulae in neonates: To splint or not?

Tiroumourougane Serane V¹,
Rathnapratheep Rajasekaran² ,
Vijayasankar Vijayadevagarani¹
and Bhuvaneswari Kothendaraman³

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Reasons for removal	Splint group (%)	Splintless group (%)	p Value
Extravasation	70 (44)	66 (42)	0.704
Erythema	11 (7)	7 (4)	
Palpable cord	3 (2)	2 (1)	

Results: Out of 159 neonates, 80 were allotted to splint group and the rest to splint-less group. Mean dwell time of intravenous line in splint group was 27.68 ± 13.03 h which was significantly less than in splint-less group (32.87 ± 15.79 h), mean difference: 5.11 h, *p* value: 0.03). Subgroup analysis in preterms showed mean dwell time of 28.54 ± 14.86 h in splint group which was less than that of splint-less group (35.10 ± 16.24 h) (*p* value: 0.03). No such difference was noted in the term neonates. Subgroup analysis for catheters put across joints does not show difference in mean dwell times between splint and splint-less groups. Multivariate regression analysis did not identify any variable which independently affected the outcome.

Conclusion: Use of splint does not prolong the dwell time of the catheter and is probably harmful in some neonates.



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Risk factors for peripherally inserted central catheter complications in neonates

Gillian C. Pet¹ · Jens C. Eickhoff² · Kate E. McNevin³ · Julie Do³ · Ryan M. McAdams⁴

Table 3 Summary of complications (*N* = 1234 lines).

	<i>N</i>	%
Nonelective line removal	351	28.4
Any complication	425	34.4
Associated with PICC clot	58	4.7
Malposition in 1st 72 h	50	4.1
Malposition over time	49	4.0
Dislodgement	37	3.0
Crack/Broken/Fracture	62	5.0
Extravasation/Infiltration	17	1.4
Phlebitis/Edema/Erythema/Perfusion changes	62	5.0
Malfunction/Occlusion	77	6.2
Failed insertion	60	4.9
Infection	18	1.4

	Upper extremity <i>n</i> /total (%)	Lower extremity <i>n</i> (%)	OR of complication with UE compared with LE PICC (95% CI) <i>p</i> value
Any complications	210/524 (40.1%)	215/710 (30.3%)	1.54 (1.22–1.94) <0.001
Nonelective line removal	183/524 (34.9%)	168/710 (23.7%)	1.73 (1.35–2.21) <0.001
Associated with PICC clot	18/524 (3.4%)	40/710 (5.6%)	0.6 (0.33–1.06) NS
Malposition in 1st 72 h	33/524 (6.3%)	17/710 (2.4%)	2.74 (1.51–4.97) <0.001
Malposition over time	35/524 (6.7%)	14/710 (2.0%)	3.56 (1.89–6.71) <0.001
Dislodgement	20/524 (3.8%)	17/710 (2.4%)	1.62 (0.83–3.16) NS
Crack/Broken/Fracture	23/524 (4.4%)	39/710 (5.4%)	0.79 (0.47–1.34) NS
Extravasation/Infiltration	13/524 (2.5%)	4/710 (0.6%)	4.49 (1.44–13.96) 0.001
Phlebitis/Edema/ Erythema/Perfusion changes	18/524 (3.4%)	44/710 (6.2%)	0.54 (0.31–0.93) 0.03
Malfunction/Occlusion	37/524 (7.1%)	40/710 (5.6%)	1.27 (0.8–2.01) NS
Failed insertion	35/524 (6.7%)	25/710 (2.3%)	1.96 (1.19–3.24) 0.009
Infection	11/524 (2.0%)	7/710 (1.0%)	2.15 (0.8–5.79) NS



Mechanical complications of weekly care and maintenance versus once every 10 days of the peripherally inserted central catheter line insertion site in newborns: A propensity score-matched cohort study in Mexico

Complications	7 days (<i>n</i> = 96)	10 days (<i>n</i> = 79)
Breakage (Yes)	22 (22.9%)*	2 (2.5%)
Occlusions (Yes)	3 (3.1%)	3 (3.8%)
Accidental withdrawals (Yes)	5 (5.2%)	3 (3.8%)
Removal for mechanical complications (Yes)	30 (31.3%)	7 (8.9%)

Original Article



Complications and Related Risk Factors of Peripherally Inserted Central Catheters in Neonates: A Historical Cohort Study

Seyyed Mostajab Razavinejad, MD¹; Najib Saeed, MD²; Shahnaz Pourarian, MD^{1*}; Mehrdad Rezaei, MD¹; Reza Bahrami, MD¹; Negar Yazdani, PhD³; Hamide Barzegar, MD¹; Fatemeh Yarmahmoodi, MD⁴

Table 2. PICC-Related Complications, Crude Incidence, and Incidence/1000 Catheter-Days

Type of Complication	Crude Incidence	Incidence/1000 Catheter-Days
Malposition	1205 (48.2%)	35.70
Edema/Occlusion	455 (18.2%)	13.48
PICC migration (dislodged)	300 (12%)	8.89

Use of cyanoacrylate glue for the sutureless securement of epicutaneo-caval catheters in neonates

Vito D'Andrea¹ , Lucilla Pezza¹, Giovanni Barone²,
Giorgia Prontera¹, Mauro Pittiruti³  and Giovanni Vento¹

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- Colla
- MST
- Sutureless device



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Table 1. Demographics population and Epicutaneo-Caval Catheters caratteristics.

	Intervention	Control	
Infants (n)	92	80	
Gestational age weeks	29	29	
Birth weigth grams	1280	1200	
Catheters (n)	134	124	
Day of life at the insertion	6	6	
Weight at insertion gramms	1230 (520–3000)	1180 (480–3270)	
Days ECC in place	10.4	11	
Elective ECC removal n (%)	95 (70.8)	89 (71.7)	
Dislodgement n (%)	1 (0.7)	14 (11.3)	0.0003

Cyanoacrylate Securement in Neonatal PICC Use

A 4-Year Observational Study

Matheus van Rens, RN, MaANP, NNP; Nuha Abdelghafar M. A. Nimeri, MD, CABP;

TABLE 3. Reasons for Device Removal, Dwell Time, and Therapy Failure

	Tissue Adhesive			P Value
	Total (N = 1842) n (%)	No (n = 975) n (%)	Yes (n = 867) n (%)	
Reason for removal				
1. Therapy completed	1313 (71.3)	637 (65.3)	676 (78.0)	<.001
2. Therapy failure ^a				
Catheter-related complications ^b	43 (2.3)	24 (2.5)	19 (2.2)	
Extravasation/infiltration	50 (2.7)	47 (4.8)	3 (0.3)	
Maintenance-related complications ^c	75 (4.1)	53 (5.4)	22 (2.5)	
Phlebitis	56 (3.0)	42 (4.3)	14 (1.6)	
Suspected sepsis	118 (6.4)	87 (8.9)	31 (3.6)	
Death (CLABSI)	8 (0.4)	6 (0.6)	2 (0.2)	



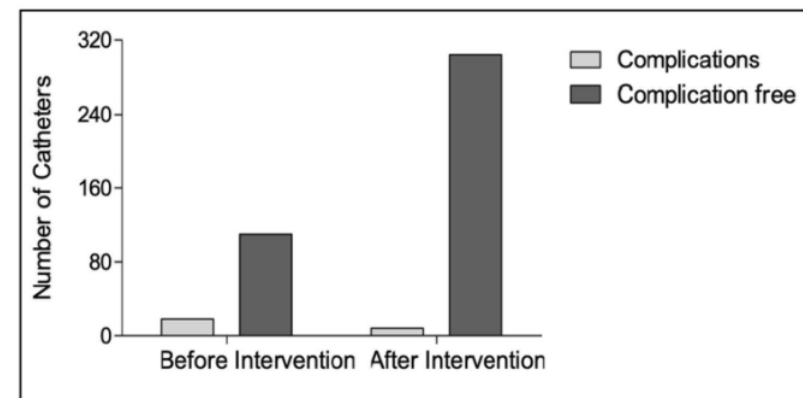
Cyanoacrylate glue as part of a new bundle to decrease neonatal PICC-related complications

Fiammetta Piersigilli¹ · Giulia Iacona² · Sarah Yazami³ · Katherine Carkeek¹ · Catheline Hocq¹ · Cinzia Auriti⁴ · Olivier Danhalve^{1,5}

Place a drop of cyanoacrylate glue (2-octyl cyanoacrylate) at the point of insertion

Fix the catheter wings to the skin using a sutureless device (Griplock[®]).

Cover the catheter up to the hub with a semipermeable transparent polyurethane dressing with high transpirability. The transparent dressing is replaced only if soiled or detached.



All complications were reduced, but especially dislocation of the catheter decreased from 13 to 1 ($p < 0.0001$)

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Research paper

Adverse events associated with umbilical vascular catheters in the neonatal intensive care unit: A retrospective cohort study

Kim Gibson, BN, MN ^{a,*}, Amber Smith, BN, MN ^d, Rebecca Sharp, BN, PhD ^a, Amanda Ullman, BN, PhD ^c, Scott Morris, MBBS, PhD, FRACP ^d, Adrian Esterman, BSc (Hons), PhD, FACE ^b

^a Clinical and Health Sciences, Rosemary Bryant AO Research Centre, University of South Australia, Adelaide, SA, Australia; ^b Allied Health & Human Performance, University of South Australia, Adelaide, SA, Australia; ^c School of Nursing, Midwifery and Social Work, The University of Queensland, Brisbane, QLD, Australia; ^d Neonatal Unit, Flinders Medical Centre, Bedford Park, SA, Australia

Risk factor	AE	No AE
	n (%)	n (%)
Birth weight (grams)		
<1000	52 (72.2)	20 (27.8)
1000–1499	38 (73.1)	14 (26.9)
1500–2499	20 (55.6)	16 (44.4)
≥2500	64 (75.3)	21 (24.7)
Total	174 (71.0)	71 (29.0)
Birth gestation (weeks)		
<27	39 (72.2)	15 (27.8)
27–32	66 (68.0)	31 (32.0)
33–36	23 (67.6)	11 (32.4)
>36 weeks	46 (76.7)	14 (23.3)
Total	174 (71.0)	71 (29.0)
Gender		
Male	88 (69.3)	39 (30.7)
Female	86 (72.9)	32 (27.1)
Total	174 (71.0)	71 (29.0)
Dwell time (days)		
<7	161 (70.6)	67 (29.4)
≥7	13 (76.5)	4 (23.5)
Total	174 (71.0)	71 (29.0)

Proportion and incidence rate of specific adverse events associated with umbilical venous catheters.

AE	Incidence proportion		Incidence Rate per 1000 catheter days	
	Yes	Denominator % (UVCs)	95% CI	IR 95% CI
All AEs	174	245	71.0 65.6–76.9	208.1 181.1–237.3
<i>Individual AEs</i>				
Malposition (1st X-ray)	148	243	60.1 55.1–67.3	a a
Dislodgement	24	244	9.8 6.7–14.4	28.7 18.4–42.4
Migration	12	182	6.6 3.8–11.4	14.6 7.4–24.9
Clinical sepsis	7	244	2.9 1.3–6.0	8.4 3.4–17.2
Phlebitis	6	244	2.5 1.1–5.4	7.2 2.6–15.6
Leakage	3	244	1.2 0.4–3.8	3.6 0.7–10.5
Skin damage	3	244	1.2 0.4–3.8	3.6 0.7–10.5
Thrombosis	3	244	1.2 0.4–3.8	3.6 0.7–10.5
Haemorrhage	2	244	0.8 0.2–3.2	2.4 0.3–8.6
Pericardial effusion	2	244	0.8 0.2–3.2	2.4 0.3–8.6
Liver damage	1	244	0.4 0.1–2.9	1.2 0.0–6.7
Not working	1	244	0.4 0.1–2.9	1.2 0.0–6.7
Haemoperitoneum	0	244	0 0	0 0
Puncture/breakage	0	244	0 0	0 0
CLABSI	0	244	0 0	0 0
Septicaemia	0	244	0 0	0 0
Extravasation	0	244	0 0	0 0

CVO

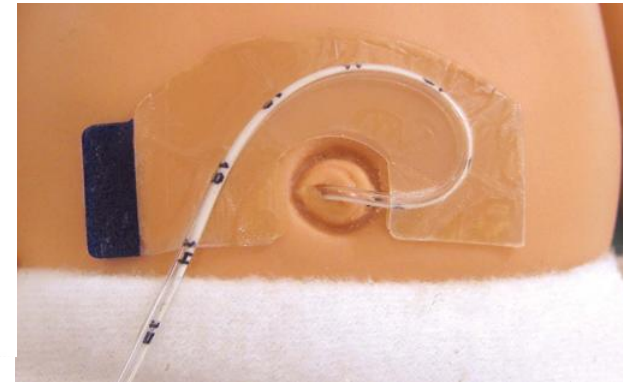
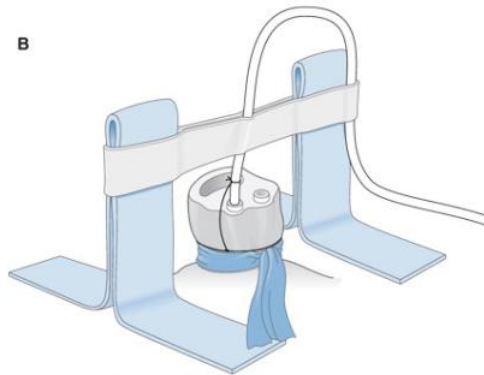
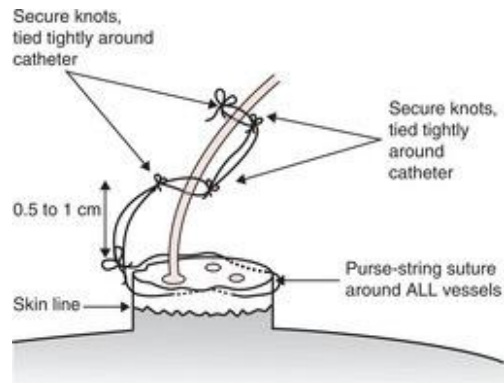


TABLE. Comparison of Umbilical Cord–Securing Techniques Based on Discussion of Advantages Versus Disadvantages

Technique	Advantages	Disadvantages	Price
1. Anchoring (with or without stitching)	No adhesives on skin.	Pain at umbilical site.	Negligible
2. Goal post or bridging	Potentially anchored more securely.	Skin irritation and infection. Catheter adjustments may require new goal post.	Negligible
3. DuoDERM method	Quick securing of umbilical cord lines.	Skin irritation and infection. Not ideal for infants requiring ultrasound of abdomen or heart.	~\$5 DuoDERM and < \$1 for Tegaderm
4. NeoBridge by Neotech Products	Hydrocolloid gel secured to abdomen. Adjustable flaps allow easy catheter adjustments.	Expensive. Skin irritation and infection.	\$8 to \$10/NeoBridge



What's new:

AN APPLICATION TECHNIQUE (use saline wipe as needed)

TECHNIQUE D'APPLICATION (utiliser une lingette imbibée de sérum physiologique si nécessaire)

EINE BEFESTIGUNGSTECHNIK (bei Bedarf Tupfer mit physiologischer Kochsalzlösung verwenden)

UNA TECNICA DI APPLICAZIONE (usare una salvietta di salina secondo necessità)

UNA TÉCNICA DE APLICACIÓN (use un paño impregnado en solución salina cuando sea necesario)

METHODE VAN AANBRENGEN (gebruik, indien nodig, een doekje met fysiologische zoutoplossing)

UMA TÉCNICA DE APLICAÇÃO (utilize a limpeza com soro fisiológico conforme o necessário)

ΜΙΑ ΤΕΧΝΙΚΗ ΕΦΑΡΜΟΓΗΣ (χρησιμοποιήστε φυσιολογικό ορό, όπως απαιτείται)



The diagram illustrates the application technique in seven numbered steps: 1. Preparing the catheter, 2. Inserting the catheter into the umbilical vein, 3. Securing the catheter with the adhesive device, 4. Applying the adhesive device, 5. Applying the adhesive device, 6. Applying the adhesive device, 7. Applying the adhesive device.

8. CARATTERISTICHE TECNICHE

- Dispositivo di fissaggio adesivo con dorso in Tyvek® flessibile
- Superficie inferiore composta da sistema adesivo in acrilico, ipoallergenico.





ARTICLE OPEN

Check for updates

Reducing umbilical catheter migration rates by using a novel securement device

Juliana R. Perl ¹, Tanya Crabtree-Beach ², Amy Olyaei², Madeline Hedges², Brian K. Jordan ² and Brian Scottoline ²✉

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OBJECTIVE: This study evaluates the effectiveness of a novel device, LifeBubble, in reducing umbilical cord catheter (UC) migration and associated complications in neonates.

STUDY DESIGN: A retrospective review was performed at Oregon Health & Science University's NICU (2019–2021) to compare standard adhesive securement with LifeBubble. The primary outcomes were UC migration, discontinuation due to malposition, and CLABSI incidence. Differences between groups were statistically analyzed and logistic regression used to adjust for potential confounders.

RESULTS: Among 118 neonates (57 LifeBubble, 61 adhesive), LifeBubble significantly reduced migration of any UC > 1 vertebral body (12.3% vs. 55.7%), including UVC migration (5.3% vs. 39.3%) and UAC migration (7.0% vs 23.0%), as well as UVC discontinuation due to malposition (5.6% vs 37.7%). The number needed to treat (NNT) to prevent one instance of UVC discontinuation is 4.

CONCLUSION: LifeBubble effectively reduces UC migration and premature discontinuation, indicating its potential to enhance neonatal care and safety.

Journal of Perinatology; <https://doi.org/10.1038/s41372-024-01943-1>

Outcome measure	Adhesive control (AC) (n = 61))	LifeBubble (LB) (n = 57)
Umbilical catheter moved more than one vertebral body, n (%)	34 (55.7)	7 (12.3)
UVC movement more than one vertebral body, n (%)	24 (39.3)	3 (5.3)
UVC discontinuation, n (%)	23 (37.7)	3 (5.6)
UAC movement more than one vertebral body, n (%)	14 (23.0)	4 (7.0)
UAC discontinuation, n (%)	4 (6.6)	0 (0)

Incidenza del fenomeno.. CVO

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ORIGINAL
ARTICLES



Securement of Umbilical Venous Catheter Using Cyanoacrylate Glue: A Randomized Controlled Trial

Vito D'Andrea, MD¹, Giorgia Prontera, MD¹, Giovanni Pinna, MD², Francesco Cota, PhD¹, Simona Fattore, MD¹, Simonetta Costa, PhD¹, Martina Migliorato, MD¹, Giovanni Barone, MD³, Mauro Pittiruti, MD⁴, and Giovanni Vento, MD¹

Objective To evaluate the role of cyanoacrylate glue in reducing dislodgement of umbilical venous catheters (UVCs).

Study design This was a single-center, randomized, controlled, nonblinded trial. All infants requiring an UVC according to our local policy were included in the study. Infants with a UVC with a centrally located tip as verified by real-time ultrasound examination were eligible for the study. Primary outcome was the safety and efficacy of securement by cyanoacrylate glue plus cord-anchored suture (SG group) vs securement by suture alone (S group), as measured by reduction in dislodgment of the external tract of the catheter. Secondary outcomes were tip migration, catheter-related bloodstream infection, and catheter-related thrombosis.

Results In the first 48 hours after UVC insertion, dislodgement was significantly higher in the S group than in the SG group (23.1% vs 1.5%; $P < .001$). The overall dislodgement rate was 24.6% in the S group vs 7.7% in the SG group ($P = .016$). No differences were found in catheter-related bloodstream infection and catheter-related thrombosis. The incidence of tip migration was similar in both groups (S group 12.2% vs SG group 11.7%).

Conclusions In our single-center study, cyanoacrylate glue was safe and effective for securement of UVCs, and particularly effective in decreasing early catheter dislodgments. (*J Pediatr* 2023;260:113517).

Trial registration UMIN-CTR Clinical Trial; Registration number: R000045844.



CVO

Table III. Incidence of UVC dislodgment at T1/T2/T3

Characteristics	Total	S group	SG group	<i>P</i> value
Dislodgments at T1	16/130 (12.3%)	15/65 (23.1%)	1/65 (1.5%)	<.001
Inward	2 (1.5%)	2 (3.1%)	-	.22
Outward	14 (10.8%)	13 (20%)	1 (1.5%)	.003
Dislodged UVC at T1	16	15	1	
Unacceptable site				
Intracardiac*	3	2	1	
Intrahepatic [†]	7	7	-	
Extra-abdomen [‡]	2	2	-	
Acceptable site	4	4	-	
Dislodgments at T2 [§]	5/127 (3.9%)	1/63 (1.6%)	4/64 (6.2%)	.37
Inward	1 (0.8%)	1 (1.6%)	-	1
Outward	4 (3.1%)	-	4 (6.2%)	.05
Dislodged UVC at T2:	5	1	4	
Unacceptable site				
Intracardiac*	1	1	-	
Intrahepatic [†]	4	-	4	
Dislodgments at T3	0	0	0	-
Overall dislodgments	21/130 (16.1%)	16/65 (24.6%)	5/65 (7.7%)	.016
Inward	3 (2.3%)	3 (4.6%)	-	-
Outward	18 (13.8%)	13 (20%)	5 (7.7%)	.27

*Withdrawn to acceptable position (junction between inferior vena cava and right atrium).



36. VASCULAR ACCESS DEVICE SECUREMENT

KEY DEFINITIONS

Adhesive securement device (ASD): an adhesive-backed device that adheres to the skin with a mechanism to hold the vascular access device (VAD) in place; a separate dressing is placed over the ASD. Both the dressing and ASD must be removed and replaced at specific intervals during the VAD dwell time.

Integrated securement device (ISD): a device that combines a dressing with securement functions; includes transparent, semipermeable window, and a bordered fabric collar with built-in securement technology.

Subcutaneous anchor securement system (SASS): a securement device that anchors the VAD in place via flexible feet/posts that are placed just beneath the skin; these act to stabilize the catheter right at the point of insertion. A separate dressing is placed over the SASS. The SASS does not need to be changed at regular intervals when the dressing is changed; it can remain in place if there are no associated complications.

Tissue adhesive (TA): a medical-grade cyanoacrylate glue that can seal the insertion site and temporarily bond the catheter to the skin at the point of insertion and under the catheter hub. Depending on the chemical makeup, TA may be reapplied at each dressing change. Various formulations of TA for wound closure are commercially available, including first generation *N*-Butyl-2-cyanoacrylate (quick drying, rigid/brittle), second generation 2-octyl-cyanoacrylate (longer dry time, more flexible) and *N*-Butyl-2octyl cyanoacrylate formation (increased tensile strength and flexibility) with an additional indication for vascular access securement. Each TA formulation has varied properties and the clinical decision to use should be based on research outcomes relative to the chosen product.



Subcutaneously Anchored Securement



≥ 3 Fr



Subcutaneously Anchored Securement

- Dimensioni: 3, 4, 5, 6, 7, 8, 12F
- Resistente alla trazione fino a 2-3 kg
- Utilizzabile in RMN
- Può essere utilizzato con qualsiasi tipo di catetere
- Riduzione del 100% dell'effetto "pistoning"
- Non serve impiegare suture o adesivi
- Resta in posizione per l'intera vita del catetere (non si sostituisce)
- Permette una pulizia dell'exit site a 360°



Securement of central venous catheters by subcutaneously anchored suturless devices in neonates

Vito D'Andrea^a , Giovanni Barone^b, Lucilla Pezza^a, Giorgia Prontera^a, Giovanni Vento^a and Mauro Pittiruti^c

ABSTRACT

Background: Accidental dislodgement of central venous catheters is a frequent complication in NICU and it often requires catheter replacement. Subcutaneously anchored sutureless devices (SAS) have been recently introduced in clinical practice for securement of different types of central catheters, but they have never been used in neonates. We evaluated safety and efficacy of SAS in neonates.

Methods: All neonates who required central venous catheters inserted *via* ultrasound-guided cannulation during 12 months of clinical practice in our NICU. We adopted SAS for securement of all central venous catheters inserted in neonates *via* ultrasound guided cannulation either of the brachio-cephalic vein (centrally inserted central catheters: CICC) or the femoral vein (femorally inserted central catheters: FICC). Results: seventy-two central catheters were inserted in 70 preterm and term neonates (3–4 Fr power injectable polyurethane catheters; 62 CICC + 10 FICC) and they were all secured with SAS. Mean postmenstrual age at the time of insertion was 31 weeks and mean weight was 1400 g. SAS was easy to place in all cases. The median duration of the line was 6 weeks. No accidental dislodgement of CICC or FICC was recorded. All SAS but one were left in place until elective removal of the catheter. In all patients, SAS removal was easy and uneventful, and it did not require any sedation or local anesthesia. Conclusions: SAS was effective in preventing accidental catheter dislodgement in 100% of cases. Complications during insertion, maintenance and removal were negligible.

Table 1. Demographics' population.

PMA at insertion (weeks)	31 ± 5.5
Weight at insertion (grams)	1400 ± 293
Indwelling time (days)	39 ± 25
Indication at insertion (n)	Surgery disease 30% (22) Respiratory distress syndrome 22% (16) BPD 20% (14) Prolonged parenteral nutrition 15% (11) Septic shock 8% (6) DIVAs >4% (3)
Elective removal	96%

Centrally inserted central catheters in preterm neonates with weight below 1500 g by ultrasound-guided access to the brachio-cephalic vein

Giovanni Barone¹ , Mauro Pittiruti² , Gina Ancora¹,
Giovanni Vento³, Francesca Tota⁴ and Vito D'Andrea³ 

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Table 1. Our insertion bundle.

Ultrasound pre-puncture evaluation of central veins (RaCeVA)
Hand hygiene and maximal barrier precautions
Skin antisepsis with 2% chlorhexidine in alcohol
Ultrasound-guided venipuncture
Tip location by intracavitary echocardiography and/or echocardiography
Tunneling the catheter so as to obtain an exit site in the infraclavicular area
Securement with the sutureless device
Sealing of the exit site with glue
Coverage with transparent semipermeable dressing

RaCeVA: rapid central vein assessment.

Table 3. Catheters' data, expressed as median $\pm$ SEM and range or number and percentage.

Dwell time; days $\pm$ SD (min–max)	37 $\pm$ 21 (2–95)
Elective removal	30 (100%)
CRBSI	0
Catheter-related thrombosis	0
Catheter malfunction	0

CRBSI: catheter-related blood stream infection; SD: standard deviation.

Systematic application of SICA-PED protocol for central venous catheterization in neonates: A prospective clinical study on 104 cases

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S Sage

Ferdinando Spagnuolo¹ , Anna Maietta¹, Umberto Pugliese¹, Emanuele Lettieri¹, Fabrizio Minopoli¹, Nicola Coppola², Marco La Verde³, Margherita Macera⁴, Caterina Monari⁴, Lorenzo Onorato² and Mauro Carpentieri¹

Abstract

Background: Catheterization of central vessels can be associated with early and late, potentially fatal complications. A proactive approach is imperative to reduce the frequency and magnitude of adverse events. Recently, the GAVeCeLT has proposed a protocol called SICA-PED (i.e. Safe Insertion of Central Access in Pediatric patients) and includes seven evidence-based strategies.

Methods: Through a single-center prospective observational study, the authors wanted to consolidate the efficacy and safety of these protocol in newborns. In a series of 104 newborns, the seven steps of the protocol were applied (1) pre-procedural ultrasound study of the RaCeVA veins, (2) correct aseptic technique, (3) ultrasound-guided venipuncture, (4) intraprocedural localization of the tip of the catheter with TTE (ECHO TIP) and (iECG) intracavitary electrocardiogram, (5) reasoned choice of the implant exit site with the RAVESTO Tunneling technique, (6) anchoring without stitches, and (7) exit point protection with the use of glue and transparent semipermeable membrane. The authors have included a further precaution in point (6) the subcutaneous anchoring system has added the counter-fixation of the catheter wings that we will call 6Plus Point.

Results: All infants requiring implantation of elective us-guided central venous access were enrolled in the study. None of the 104 implanted central venous catheters experienced early complications (accidental arterial puncture, PNX, primary malposition); rare late complications such as ecchymosis, CRBSI, exit site infection or dislodgement were observed. No catheter-related thrombotic phenomena were observed. The CRBSI catheter-related infection rate was 2.47×1000 days catheter cases.

Conclusion: The results of this prospective study strengthen the feasibility and efficacy of the SICA-Ped Protocol. Demonstrating that the systematic application of the evidence-based seven-step implantation strategy increases the success rate, minimizes early and late complications, which result in increased patient safety.

Tab 3. Post-procedural complications: late.

	CICC = 103	FICC = 1
Dislodgment	1 (0.96%)	—
Secondary misplacement	1 (0.96%)	—
Local ecchymosis	—	—
Infection of exit site	1 (0.96%)	—
Local pain at exit site	—	—
Lumen occlusion	—	—
CRT	—	—
CRBSI	3	—

36. VASCULAR ACCESS DEVICE SECUREMENT

KEY DEFINITIONS

Adhesive securement device (ASD): an adhesive-backed device that adheres to the skin with a mechanism to hold the vascular access device (VAD) in place; a separate dressing is placed over the ASD. Both the dressing and ASD must be removed and replaced at specific intervals during the VAD dwell time.

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Membrana Semipermeabile Trasparente

Le medicazioni semipermeabili trasparenti sono progettate per consentire il passaggio del vapore (traspirazione) ma impedire il passaggio di virus e batteri



Membrana Semipermeabile Trasparente

- Facile applicazione (mantenimento sterilità, medicazione ben distesa)
- Facile rimozione (evita lesioni cutanee e manipolazione del catetere)
- Traspirabilità (prevenzione lesioni cutanee, reazioni cutanee e protezione dalle infezioni)
- Adesività (stabilizzazione e protezione dalle infezioni)
- Idonea all'area cutanea da medicare (mobilità)
- Dimensioni adeguate all'accesso venoso e al paziente
- Confortevole per il paziente e non irritante

Comparing test methods for moisture-vapor transmission rate (MVTR) for vascular access transparent semipermeable dressings

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Paul Bainbridge¹, Paul Browning², Stéphanie F Bernatchez³ ,
Casey Blaser³ and Guido Hitschmann¹

Dressing	MVTR liquid (inverted method)	MVTR vapor (upright method)
A	4089	1682
B	845	773
C	1225	1079
D	1047	976
E	1031	936
F ^b	30,530	2838
G	5164	1644

Secure & Protect

- La scelta dei materiali della medicazione
- La sinergia degli elementi della medicazione

Stabilizzazione

- ❖ Del tratto esterno del catetere
- ❖ Prevenzione micromovimenti che causano irritazione venosa e danno endoteliale

Protezione

- ❖ Dalla colonizzazione microbica della cute circostante
- ❖ Dalla contaminazione diretta (mani o altri materiali)

A novel neonatal protocol for Safe Insertion of Umbilical Venous Catheters (SIUVeC): Minimizing complications in placement and management

Giovanni Barone¹ , Mauro Pittiruti² , Giorgia Prontera³,
Gina Ancora¹ and Vito D'Andrea³ 

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Table 1. The eight steps of the SIUVeC protocol.

Pre-procedural evaluation (including US evaluation).

Adoption of pre-assembled insertion kits.

Appropriate aseptic technique (hand hygiene, maximal barrier precautions, skin antisepsis with 2% chlorhexidine in 70% isopropyl alcohol).

Vein cannulation using the smallest catheter that may meet the infusion requirements and choosing wisely between single versus double lumen UVC.

Real-time tip navigation and tip location by US (according to the NeoECHOTIP protocol).

Securement of the catheter and protection of the exit site (combining sutureless devices, cyanoacrylate glue, semipermeable transparent membranes).

Post-procedural serial assessment of tip location by US.

Early removal of the device (within 4–5 days).

The SIECC protocol: A novel insertion bundle to minimize the complications related to epicutaneo-cava catheters in neonates

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Vito D'Andrea¹ , Mauro Pittiruti² , Giorgia Prontera¹,
Gianni Vento¹ and Giovanni Barone³ 

Table 1. The seven steps of the SIECC protocol.

1. Pre-procedural evaluation of superficial veins (including the RaSuVA protocol)
2. Adoption of pre-assembled insertion kits
3. Appropriate aseptic technique (hand hygiene, maximal barrier precautions, skin antisepsis with 2% chlorhexidine in 70% isopropyl alcohol)
4. Intra-procedural assessment of tip navigation and tip location by ultrasound (adopting the Neo-ECHOTIP protocol)
5. **Securement of the catheter and protection of the exit site**
6. Post-procedural serial assessments of tip location by ultrasound
7. Removal of the device within 2 weeks

