

Novel dressing and securement techniques for PICC in paediatrics

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ESTABLISHING and maintaining vascular access is a vital but problematic component of caring for a paediatric patient.

Peripherally inserted central catheters (PICCs) are being increasingly used to solve this clinical problem (Gibson, 2013), however, up to 30% may fail due to infective, vascular or mechanical complications (Chopra, 2012). PICC failure delays treatment, and prolongs hospitalisation.

Furthermore replacing a catheter is distressing for the child and parent, detrimental to vessel health and consumes valuable and finite healthcare resources.

The dressing and securement of a PICC has three objectives:

1. Provide stability to prevent catheter malposition and dislodgement, and minimise vessel injury by reducing micromotion at catheter insertion site.
2. Provide haemostasis.
3. Reduce microbial entry infection by covering the entry site.

The unacceptably high rate of PICC failure suggests current dressing and securement techniques might be ineffective.

Several new technologies have recently emerged to address this clinical problem, however at present this important clinical question remains unanswered.

Methods

This single centre paediatric PICC study was a pilot, parallel, 3-arm randomised control trial (RCT) to test the feasibility of aspects of the Central venous Access device Securement And Dressing Effectiveness (CASCADE) trial.

Results

One hundred and one children (aged 0-18 years) were randomised to receive standard care (bordered polyurethane dressing) [BPU] with suture-less securement device, tissue adhesive (TA) plus BPU or integrated securement dressing (ISD) with 95 patients included in the analysis.

The study protocol was found to be feasible; 74% of patients screened met the inclusion criteria, 91% of eligible patients consented, minimal protocol violations occurred and only one patient withdrew.

Overall 5% PICCs failed and there was a 16% complication rate (see figure1). Both parents

Group 1 – standard care BPU + SSD (n=32)	Group 2 - ISD (n=31)	Group 3 - TA + BPU (n=32)
Dwell time [¥] - 8 days (4.4-11.9) Failure - 2 (1 dislodgement-complete; 1 breakage)	Dwell time [¥] - 7 days (5-11.8) Failure - 2 (1 dislodgement-partial; 1 breakage)	Dwell time [¥] - 7.1 days (5-11.5) Failure - 1 (1 dislodgement-complete)
PICC complications - 5 (16%)	PICC complications - 5 (16%)	PICC complications - 5 (16%)
Skin complications - 5 (16%)	Skin complications - 3 (10%)	Skin complications - 10 (31%)
Parental satisfaction [#] - 7.60 (3.8)	Parental satisfaction [#] - 9.20 (2.00)	Parental satisfaction [#] - 8.55 (3.05)
Clinician satisfaction [#] Ease of application - 9.55 (2.15) Difficulty in removal* - 7.35 (6.55)	Clinician satisfaction [#] Ease of application - 9.70 (1.60) Difficulty in removal* - 9.20 (2.10)	Clinician satisfaction [#] Ease of application - 9.70 (1.25) Difficulty in removal* - 6.05 (7.30)

BPU – bordered polyurethane dressing (Tegaderm 1614 or 1616,3M; SSD – Statlock VPPCSP; ISD – integrated securement device (SorbaView SHIELD SV254); TA – tissue adhesive (Histoacryl, B.Braun; ¥ – median and 25th/75th percentile shown; # 0 = very difficult/unsatisfied; 10 = very easy/satisfied; * p=0.002

and clinicians were satisfied with all interventions however clinicians found ISD to be significantly easier to remove than standard care or TA.

Conclusions

Although firm conclusions cannot be made because this was a pilot study, the take home messages include:

1. The CASCADE protocol is feasible in this population, and, given fewer PICCs failed in this study compared to previous reports, these products appear safe and effective.
2. TA might provide a useful adjunct to post-insertion care by providing immediate haemostasis and reducing the need for early dressing change. ■



REFLECTIVE QUESTIONS

1. Reflect upon your current dressing and securement practice and consider how these options might add value or complement your current practice.
2. Considering participants in this pilot trial were children (aged 0–18), how does this population differ from your own patients and how might this impact your dressing and securement choices?

Don't forget to make note of your reflections for your record of CPD.

References

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