The use of ultra long-length peripheral intravenous catheters to increase success rates in difficult intravenous access patients

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INTRODUCTION

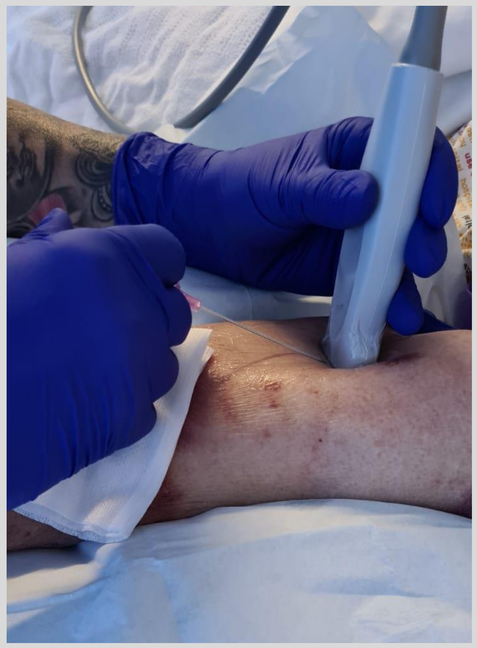
Up to 50% of peripheral intravenous catheters (PIVCs) fail within the first 4 hours (Steere *et al*, 2020) and up to 90% before therapy completion (Helm *et al*, 2015). Failure can be caused by factors such as infiltration, dislodgement, occlusion/mechanical failure, or infection, and is more likely to occur in difficult intravenous access (DIVA) patients.

A number of treatment pathways are available to successfully cannulate DIVA patients, including ultrasound guidance. However, in our trust, even with ultrasound, the use of a standard length (25mm) peripheral intravenous catheter (PIVC) in DIVA patients frequently leads to unacceptably short device longevity and poor patency. Here we report on the effect of introducing the Introcan Safety Deep Access (64mm) PIVC which is an extended length and is specifically designed for DIVA patients.

METHODS

An extended length PIVC (Introcan Safety Deep Access) was inserted in 156 DIVA patients, under ultrasound guidance. The date inserted and date removed for each PIVC was recorded, to assess dwell time. The reason for removal was recorded in each instance, to ascertain the proportion of PIVCs removed for reasons other than catheter failure.

The image below shows the insertion of Introcan Safety Deep Access under ultrasound (US) guidance in an elderly DIVA patient, who had small, fragile, superficial veins which were challenging to visualise by eye, owing to heavy bruising.



RESULTS: COMPLETION OF THERAPY IN DIVA PATIENTS (%)

Using the Introcan safety Deep Access resulted in favourable device **success rates of 85.3%.**

Device success rate (%)

85.3% Our data

69% Bahl *et al* (2020) Ultra-long catheter inserted under ultrasound guidance

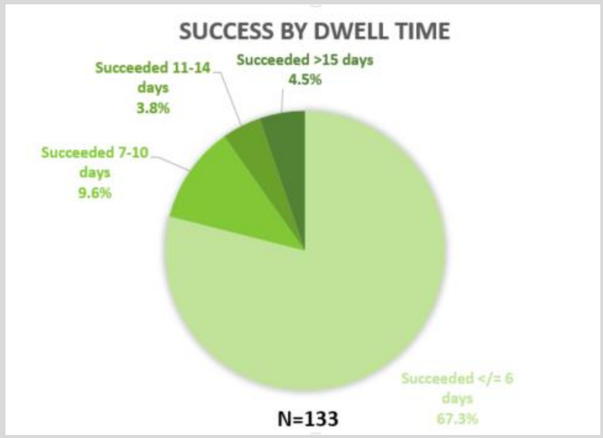
58% Bahl *et al* (2020) Standard length catheter inserted under ultrasound guidance

27% Bahl *et al* (2018) Standard length catheter inserted under ultrasound guidance

In the vast majority of patients, the reason for catheter removal was due to factors outside of failure. Indeed, catheter failure accounted for just 15.7% of those removed. Compared with other studies of US-guided cannulation in DIVA patients (Bahl *et al*, 2018; 2020), our success rates were higher.

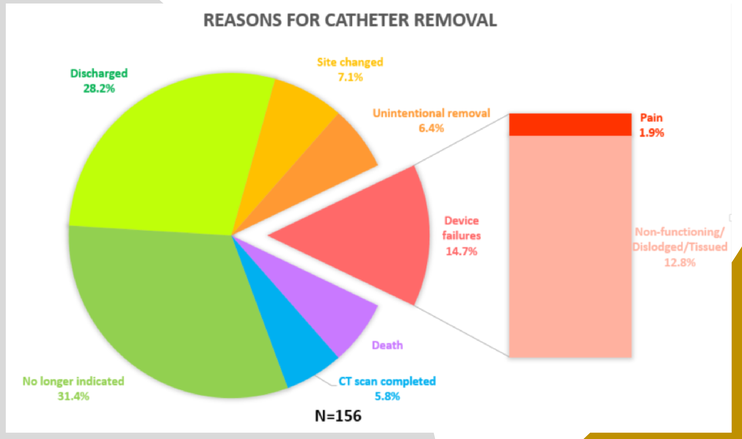
In the studies by Bahl *et al*, US-guidance was used as standard across all PIVC lengths, demonstrating that it is the combination of US when used with a longer length catheter, which contribute towards maximising dwell time and reducing the likelihood of catheter related complications.

RESULTS: SUCCESS BY DWELL TIME



The median dwell time of Introcan Safety Deep Access when inserted into patients with DIVA was **4 days**. Of the 133 successful cannulations, 67.3% were removed after 6 days or fewer. 7 successful cannulations lasted as long as **15 days** or more, which is particularly favourable in light of the high failure rates PIVCs often have.

RESULTS: REASONS FOR REMOVAL



In 14.7% of cases, catheters were removed due to failures such as non-functioning or dislodgement (12.8%), or patient pain (1.9%).

The most common reasons for removal were that the PIVC was no longer indicated (31.4%) because treatment was complete or that the patient was discharged (28.2%).

CONCLUSION

The median dwell time in patients who had been cannulated ≥24 hours was 4 days. Furthermore, successful therapy completion (i.e. no catheter failure) was achieved in 85.3% of all DIVA patients. This is particularly favourable in comparison with catheter success rates in the literature such as 27% (Bahl *et al*, 2018).

REFERENCES

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