

Use of Kitelock 4% in treating central-line associated bloodstream infection (CLABSI)



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Background

Central line-associated bloodstream infections (CLABSIs) are a major source of morbidity and have a significant impact on mortality and healthcare cost, adding to complications in patients who are already sick (Liu et al, 2018). In difficult access patients who are high-risk for developing complications, line locks are used to prevent or treat CLABSIs, particularly in patients receiving PN, living with chronic health conditions, have a history of line infections or repeated periods of catheterisation (Saucedo et al, 2025). This clinical case describes the use of Kitelock 4% to treat a CLABSI when line salvage was essential and antibiotics were contraindicated.

Disclaimer—Informed consent was obtained for collection and publication of case.

Clinical case

A 34-year-old female patient with a history of extremely complex vascular access, multiple previous line infections and a Chlorhexidine allergy was receiving treatment as an inpatient for necrotizing fasciitis. Establishing central vascular access was unattainable due to a history of line associated bilateral upper limb DVT, superior vena cava obstruction (SVCO) and occlusion of bilateral subclavian, femoral and internal jugular veins. All attempts to maintain peripheral intravenous access using cannulation or midline failed soon after insertion. Following unsuccessful attempts at recanalization in interventional Radiology, a tunnelled central venous catheter was successfully placed under fluoroscopic guidance via an abdominal approach into a collateral vein leading into the inferior vena cava. Within 6 days of placement, the patient began showing symptoms consistent with sepsis, including feeling unwell, raised lactate, pyrexia >40°, elevated inflammatory markers and hypotension (Evans et al, 2021) requiring support with vasopressors, alongside intravenous antibiotics and other therapies for symptom control. Paired blood culture results later confirmed gram-negative bacteraemia. Although the patient had other potential sources including chest and deep seated wound infection, these were excluded as the blood culture organism was not found in other specimens that were taken as part of the full septic screen.

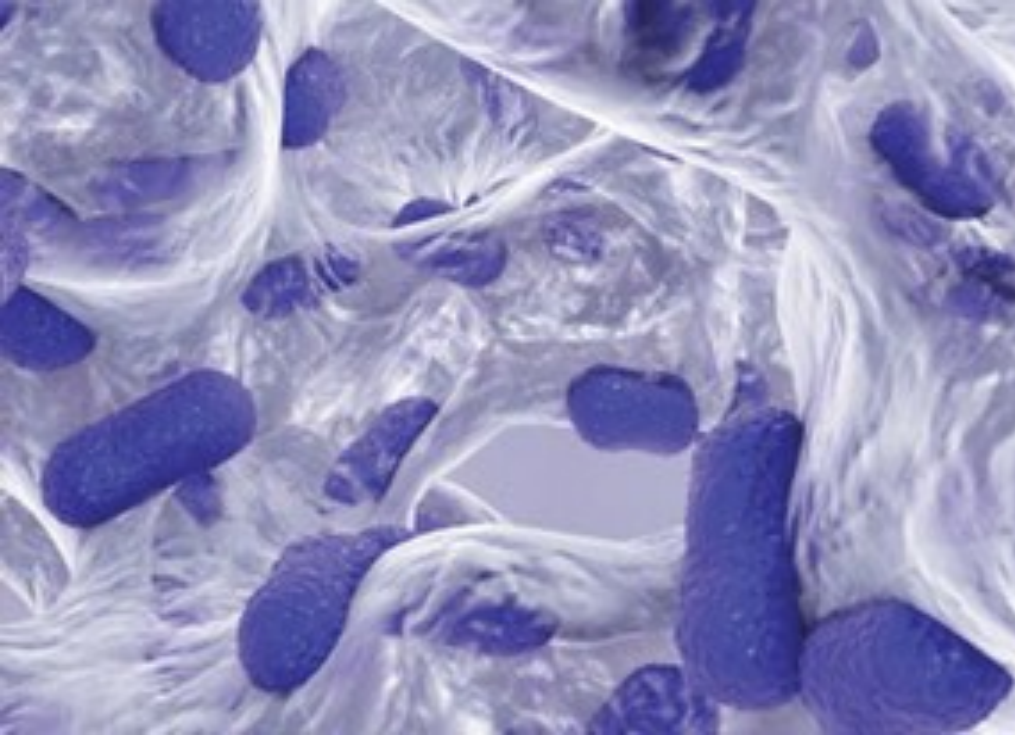
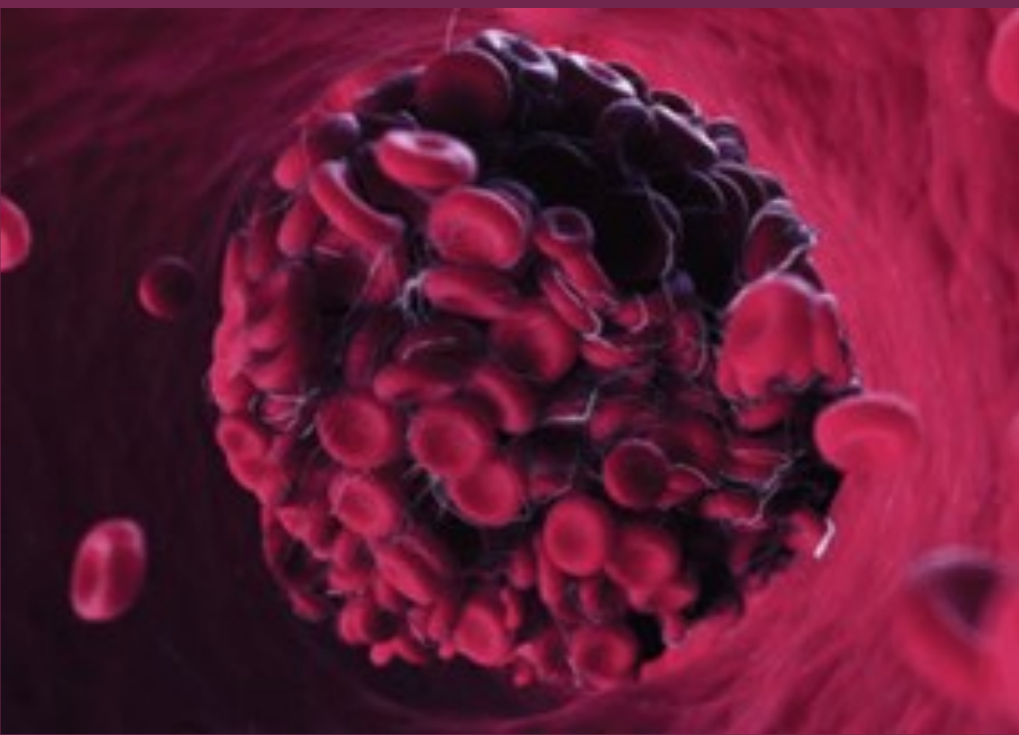
Following discussion between specialist IV access team and microbiology and other sources had been ruled out, line removal was initially advised. Due to the high likelihood of not being able to establish venous access again, the option of line salvage was discussed with the wider multidisciplinary team and considered the only appropriate course of action.

Despite the fact that Kitelock 4% is currently licensed in the UK for prophylactic use, the decision was made to trial it as an anti-infective line locking treatment alongside use of intravenous antibiotics to eradicate the infection and preserve venous access. Kitelock 4% is currently the only line locking solution available which is effective against the TripleThreat—clot formation, microbial colonization and biofilm formation (Barton, 2024; Liu et al, 2018). After receiving 3ml Kitelock 4% solution as a line lock once per day for 3 weeks, repeat cultures from the device demonstrated no bacterial growth and the patient’s condition and clinical parameters had markedly improved.

Discussion

This case illustrates the challenges of managing CLABSI in patients with a complex vascular access history. Practitioners who place vascular access devices can implement preventative strategies to reduce post procedure complications such as good insertion technique, ultrasound guided placement, surgical aseptic technique, thorough skin decontamination, adherence to best practice for line care and maintenance and patient education (Hill and Garner, 2021). However when complications arise, conventional approaches such as line removal and replacement are not always feasible for those with such limited options for venous access. Repeated catheter placement also increases the risk of stenosis and thrombosis which can lead to total occlusion of the vessels further limiting options for device replacement (Bonnes et al, 2018; Patel et al, 2019). In this case, the patient had a long history of repeated catheterization which would likely have contributed to poor vessel health. Catheter salvage with use of line locking was a more favorable option as it avoided risk of severe complications from removing the intricately placed device and leaving the patient without stable access, which could have had life threatening consequences.

Line locking refers to the practice of instilling a solution (such as antibiotics, urokinase or heparin sodium) into the lumen of a vascular access device and allowing it to dwell for the purpose of maintaining patency or treating infection or blockage (Fan et al, 2024; Zhu et al, 2022). Although there is evidence to support the use of antibiotic line locks in treating CLABSI, there are limitations to their use (Hill and Garner, 2021). Antibiotic line locks do not fully eradicate biofilms which can lead to organism regrowth once the course is complete, whereas Kitelock 4% actively targets and disrupts biofilm formation killing microorganisms embedded within the structure (Liu et al, 2018). As Kitelock 4% is a non-antibiotic antimicrobial, it is an effective broad-spectrum treatment against gram-positive, gram-negative bacteria and fungi unlike antibiotics which are organism specific (Ornowska et al, 2022). Additional benefits to Kitelock 4% also include antimicrobial and anticoagulant properties without the promotion of antibiotic resistance, risk of bleeding, adverse drug reactions/interactions and low risk of toxicity (Hill and Garner, 2021).



Conclusion

CVADs are a key component used in complex patients with lifelong conditions, however prolonged use can increase the risk of CLABSI due to microbial colonization within the biofilm structures, often resistant to antimicrobial treatments. In this case, the utilization of Kitelock 4% demonstrated effective eradication of the infecting pathogen whilst offering other benefits such as decreased risk of occlusion and anti-biofilm properties which is key in the prevention of bacterial colonization. Use of Kitelock 4% was proven successful in treating a gram negative bacteraemia, resulting in a positive clinical outcome for a patient with a history of difficult venous access - this case highlights how use of Kitelock 4% could be a promising international strategy for combating active CLABSI.

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