

Unusual Cause for Continuous Renal Replacement Therapy Filter Clotting

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Clinical Images in Nephrology and Dialysis

Case Answer

A 54-year-old woman presented with massive pulmonary thromboembolism. Catheter-directed thrombolysis was unsuccessful. Subsequent mechanical thrombectomy was complicated by cardiac arrest, and the patient required vasopressor and extracorporeal membrane oxygenation support. Given anuric kidney injury, continuous RRT (CRRT) was initiated. She had prolonged sedation with propofol, and on hospital day 15, she developed recurrent clotting on CRRT despite the use of adequate regional citrate anticoagulation. A lipid substance in the tubing was noted as clogging the CRRT and extracorporeal membrane oxygenation circuits (Figure 1). Additionally, laboratory values showed worsening anion gap metabolic acidosis (serum HCO_3^- : 14 mmol/L; anion gap: 20) with normal lactic acid (3.4 mmol/L). A diagnosis of propofol infusion syndrome was suspected, and serum triglycerides were checked and came back elevated at 1132 mg/dl (72 mg/dl on admission). Propofol was immediately stopped. The following day, serum triglyceride level dropped to 850 mg/dl, and no further clotting or lipid material was noted. Propofol infusion syndrome is a rare but potentially fatal complication typically associated with high-dose infusion ($>67 \mu\text{g}/\text{kg}$ per minute) for over 48 hours (1). However, as in this case, toxicity has also been reported

with lower doses given over an extended period of time. Additional risk factors include critical illness, vasopressor use, and severe liver injury. Typical features include unexplained anion gap metabolic acidosis, hyperkalemia, hypertriglyceridemia, and cardiac dysrhythmias (2). Propofol is a lipid emulsion, and excessive doses of this lipid emulsion do not hydrolyze in the plasma, leading to elevated triglyceride levels (3). The exact mechanism as to how hypertriglyceridemia leads to CRRT clotting is not entirely elucidated, but some theories include hypertriglyceridemia leading to hyperviscosity as well as obstruction of the hemofilter fibers by lipid material (4). Our patient illustrates an unusual manifestation of this rare entity that allowed prompt diagnosis and intervention, averting potentially fatal consequences.

Teaching Points

- Propofol infusion syndrome can be a rare cause for CRRT filter clotting.
- Early recognition of propofol infusion syndrome is important to prevent potentially fatal complications.

Author Contributions

M. Whitlow, A. Rajasekaran, and D. Rizk wrote the original draft, and reviewed and edited the manuscript.

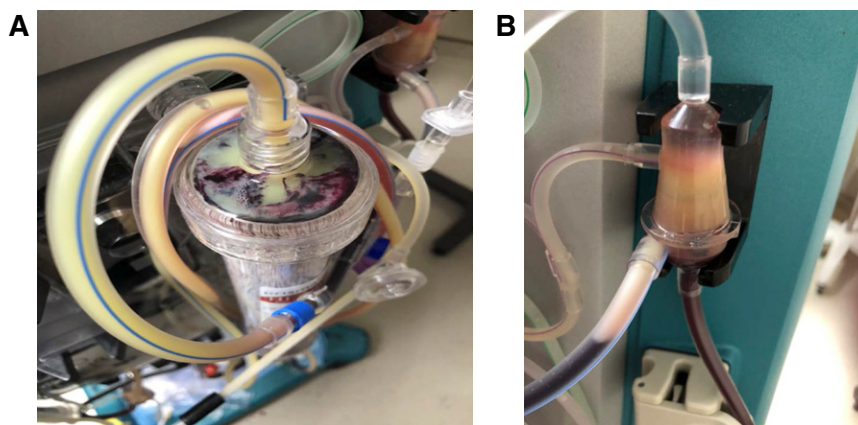


Figure 1. | Lipid material noted clogging CCRT circuit. (A) Lipid material in continuous RRT (CRRT) filter. (B) Lipid material in CRRT deaeration chamber.

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Disclosures

M. Whitlow, A. Rajasekaran, and D. Rizk have nothing to disclose.

References

1. Mirrakhimov AE, Voore P, Halytskyy O, Khan M, Ali AM: Propofol Infusion Syndrome in Adults: A Clinical Update. *Critical Care Research and Practice* 2015: 1–10, 2015
2. Kam PC, Cardone D: Propofol infusion syndrome. *Anaesthesia* 62: 690–701, 2007
3. Kaur H, Nattanamai P, Qualls KE: Propofol and clevidipine-induced hypertriglyceridemia. *Cureus* 10: e3165, 2018
4. McLaughlin DC, Fang DC, Nolot BA, Guru PK: Hypertriglyceridemia causing continuous renal replacement therapy dysfunction in a patient with end-stage liver disease. *Indian J Nephrol* 28: 303–306, 2018