

Tricks-of-the-trade: Field Peritoneal Dialysis

Assume you are down-range and unable to transfer a casualty from your position to definitive care. If your injured soldier, or Marine, has sustained injuries significant enough to induce renal failure and fluid overload, field-expedient peritoneal dialysis (PD) can help you buy time until evacuation to a higher care echelon is possible. Here is what you need to know . . .

- Nephrology consultation is available through nephrology.consult@us.army.mil. Often there is nephrology support available at Level III facilities. If at all possible, nephrology consultation should be obtained prior to undertaking PD. However, if your patient's condition dictates emergent PD for stabilization, it is important to understand the basics of the technique.
- First, gather all necessary supplies. See the inset for a recommended equipment list. A Tenckoff catheter and CAPD transfer set are ideal, but in the absence of nephrology capabilities, it is unlikely that these items will be available to the emergency physician. Reasonable alternatives are therefore included.

EQUIPMENT NEEDED FOR PD

- DPL catheter (chest tube or any other tube device with distal portholes may also be used)
 - Drainage bag (emptied IVF bag, blood collection bag)
 - IV tubing with roller clamp
 - Mask/gown/cap
 - Disinfectant
- For emergency physicians who are not trained in the placement of peritoneal catheters, we can revert to skills we are trained in and apply these principles to the placement of a PD catheter. The catheter can be placed using techniques employed in paracentesis. Alternatively, catheter placement can be approached in the same fashion as performing a DPL using either the open, semi-open, or closed (trochar) technique. The method used will depend on the training of the physician, comfort with the different techniques, and available equipment. Obviously placing a larger catheter/drain such as a chest tube is best accomplished using an

open technique with visualization of tissue planes to minimize risk of bowel perforation.

- Once the infusion/drainage device is placed, the dialysate can be infused. For the non-nephrologist, Lactated Ringers can be used as a simple field expedient dialysate -- it closely mimics the electrolyte profile of stock dialysate. Glucose can be added to the dialysate to create a 1.5-4.5% glucose solution.
- Once the LR bag is spiked with infusion tubing, air should be bled from the line prior to connecting to PD catheter. Up to 3 liters of dialysate can be infused. Dwell time should be 1-4 hours.
- After an adequate dwell time has transpired, the catheter can be connected to the drain bag. The drain bag should be placed in a dependent position (on floor) and the dialysate collected in the drain bag
- It is important to note that sterile technique is of the utmost importance to prevent peritonitis. Of course, field conditions make this somewhat challenging but diligence in this matter can prevent morbidity and mortality for the patient.
- Electrolyte measurement should be repeated after PD to follow the electrolyte changes and renal function, but multiple exchanges may be necessary per day as needed to correct the renal failure and fluid overload.

REFERENCES

- Grapsa E, "Peritoneal Dialysis without a physical dialysis unit," *Clin Nephrol.* 2010 Jun; 73(6):449-53.
- Pina JS, Moghadam S, Cushner HM, et al., "In-Theater Peritoneal Dialysis for Combat-Related Renal Failure," *J Trauma.* 2010 May; 68(5):1253-56.