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Case Report

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Post-Operative Restrictive Fluid Therapy for Abdominal Compartment Syndrome in ICU: Case Report

Ayu Yesi Agustina*, Wiwi Jaya Span KIC, Arie Zainul Span KIC and Ruddi Hartono Span FAKV

Anesthesiology Department at the Medical Faculty of Brawijaya University, Indonesia

***Corresponding author**
Dr. Ayu Yesi Agustina, Anesthesiology Department at the Medical Faculty of Brawijaya University, Indonesia. E-mail: ayuyesoy@gmail.com

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Introduction

Abdominal compartment syndrome (ACS) in severely injured patients is associated with high morbidity and mortality. Abdominal compartment syndrome occurs when intra-abdominal pressure increases above 20 mmHg. The treatment is not only through fluid resuscitation and surgical decompression, but also through adequate therapy in ICU for post-operative care. Patients with ACS usually come to ER in septic shock condition, which administrations of fluid during initial resuscitation remains a major therapeutic challenge.

Case Report

A male, 68 years old, came to ER with abdominal pain, lump around umbilicus, and shortness of breath. Patient was diagnosed with incarcerated hernia umbilicalis with septic shock and suspicion lead to abdominal compartment syndrome. The patient had fluid resuscitation and was supported with Norepinephrine 0,1 mcg/bw/min and Dobutamine 10 mcg/bw/min. He underwent laparotomy for abdominal decompression, and post-operative care in the ICU with ventilator. The second day in ICU, his abdomen had become more distended with intraabdominal pressure about 27 mmHg followed by anuria and decreased tidal volume, then we communicate with surgeon to perform abdominal re-decompression. The abdomen remained open with Bogota bag and the patient went back to ICU with ventilatory support.

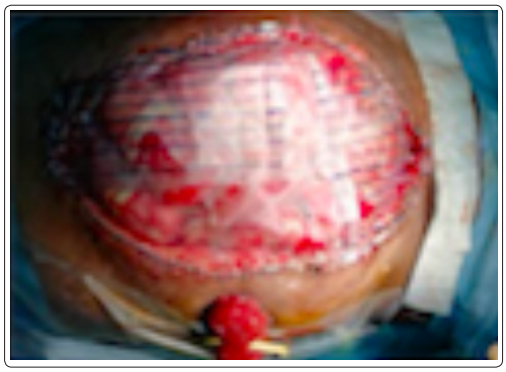


Figure 1: After re-laparatomy decompresion with Bogotta Bag

We targeted negative fluid balance for this patient with vasopressor support and used Meropenem as antibiotic. General conditions of the patient improved and extubation was performed in the seventh day following tapering off the vasopressor. The patient remained stable and was transferred to the ward on the ninth day

Discussion

For decades, fluid resuscitation has been considered a pivotal intervention in the treatment of patients with sepsis and circulatory impairment. The hemodynamic consequences of sepsis are complex and several pathophysiological characteristics serve as rationale for fluid administration including dehydration, increased vascular permeability leading to decreased intravascular fluid volume and decreased vascular tone [1].

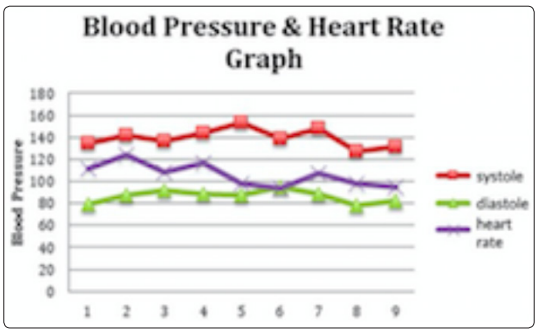
There are only four major indication for intravenous fluid administration; aside from resuscitation intravenous fluid many other uses including maintenance and replacement of total body water and electrolytes, as carries for medications and for parenteral nutrition [2]. In this paradigm-shifting review, we discuss different fluid management strategies including early adequate goal-directed fluid management, late conservative fluid management and late goal directed fluid removal [2].

The capillary leak that is inherent to sepsis promotes the extravasation of large amounts of fluid, inducing relative central hypovolemia that often excessive, and undesirable loss of fluid and electrolytes with or without protein into the interstitium that generates anasarca and end organ oedema, causing organ dysfunction and eventually failure [1]. Traditional intravenous fluid regimens that are administered during abdominal surgery deliver up to 7 liters of fluid on the day of surgery. Such regimens can lead to tissue edema and weight gain of 3 to 6 kg. Some small trials have shown that a more restrictive fluid regimen led to fewer complications and a shorter hospital stay [3].

Disease processed are dynamic and their response to fluid may change over time. Specific disease states may also require different fluid therapy. Follow up during fluid administration should therefore include surrogate markers of organ perfusion (e.g. mean arterial pressure, central venous oxygen saturation, lactate, CO), markers of circulation, blood electrolyte and acid base composition and indicators of renal function [4]. After successful treatment in

first phase of septic shock, the patient may either further recover, entering the "no-flow" state, followed by a third hit, usually resulting from global increased permeability syndrome with ongoing fluid accumulation due to capillary leak. In any case, the patient enters a phase of "de-resuscitation". It specifically refers to *late goal-directed fluid removal and late conservative fluid management* [1].

This patient suffered from septic shock and laparotomy decompression because of abdominal compartment syndrome condition. During the initial condition, the patient required fluid resuscitation. But for the following steps, the patient will undergo a phase where he recovered from sepsis and the resuscitation fluids given will move to the third space. This was able to be evaluated from stable hemodynamic trends with decrease in the dosage of vasopressor. Therefore, in this condition, we were able to evacuate excess fluids by using the late goal-directed fluid removal method through administering furosemide, and the late conservative fluid management method where we limited the fluids given.



Graph 1: The trend of hemodinamic changes in this patient

Conclusion

To treat patients with abdominal compartment syndrome, we need adequate fluid resuscitation, vasopressor, broad spectrum antibiotic, decompression laparotomy, and meticulous post-operative care in the ICU. We successfully managed an ACS patient with negative fluid balance to decrease fluids in the interstitial space. The result was remarkable and satisfying, the conditions of the patient improved which was showed by the patient's stable hemodynamic condition and the absence of edema on the tissue. On the ninth day of treatment at the ICU, the patient's vital signs showed good signs and the patient no longer used vasopressor.

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