

Expected And Unexpected Hemodynamic Changes From Abdominal Compartment Syndrome Through General Anesthesia

Colette B. Gazonas, Alejandro Hallo-Carrasco, Evan Berger
Newark Beth Israel Medical Center

Learning Objectives

- To understand how the cardiovascular and respiratory effects of abdominal compartment syndrome impact anesthetic management
- To better understand perioperative management of patients with abdominal compartment syndrome

Case Description

- Patient is a 72-year-old male with obesity, hepatic steatosis, hypertension, and active opioid abuse
- Presents with abdominal pain, abdominal distention, and no bowel movement for 3.5 weeks

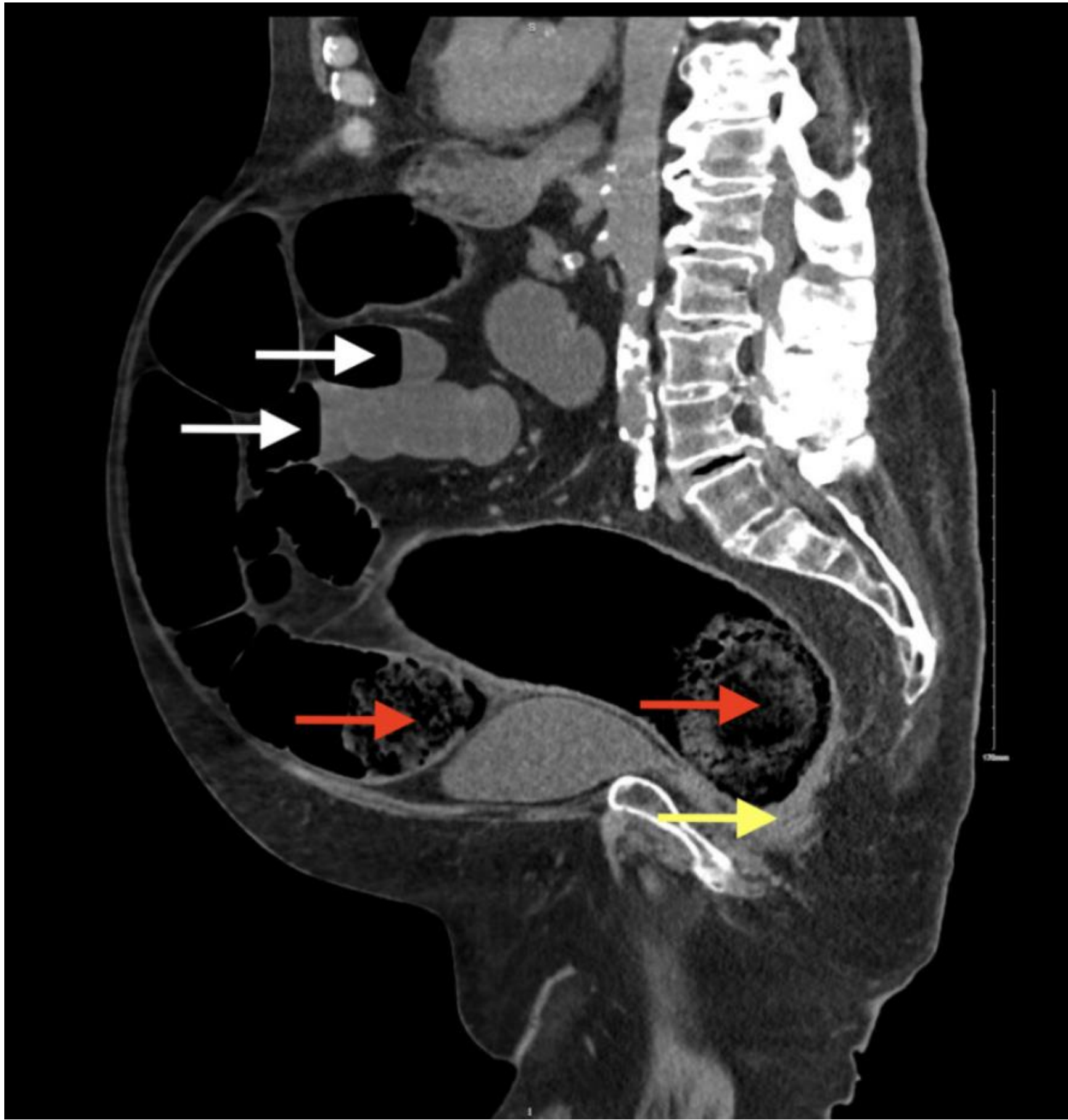


Figure 1: CT abdomen demonstrating severe fecal impaction (red arrows), stercoral colitis (yellow arrow), and multiple dilated loops of small bowel with air-fluid levels (white arrows)

Perioperative Course

- Emergent diagnostic laparotomy was indicated in the setting of pneumoperitoneum from perforated bowel
- Patient was brought to the operating room and induced via rapid sequence induction using etomidate, propofol, and succinylcholine
- Immediately post-induction, the patient experienced cardiovascular decompensation

	Preoperative Value	Post-Intubation Value
Blood Pressure	154/82	82/68
Heart Rate	120	109
Respiratory Rate	20	10
SpO2	95	72
Temp (temporal)	35.8 (96.4)	-
ETCO2	-	25

- Invasive hemodynamic monitoring was established via a left radial arterial line and central venous access was obtained via the right internal jugular vein
- Intraoperatively, patient required IV fluid resuscitation, vasopressors (phenylephrine 300mcg, norepinephrine 4mcg, vasopressin 0.1mL), and antibiotics
- Hemodynamics improved following surgical incision and decompression
- Intraoperatively, abdominal compartment syndrome was diagnosed secondary to 2L intraabdominal feces from bowel perforation
- After surgical decompression, patient received 3L fluids prior to perforated bowel resection
- Wound was left open, and decision was made to leave patient intubated and to transfer him to the ICU post-operatively

Physiologic Effects of Abdominal Compartment Syndrome

- Decreased abdominal wall compliance
 - Increased airway pressures and reduced lung volumes
 - Impaired venous return
- Hypoxemia and hemodynamic instability

Considerations in Perioperative Management

- **Anesthetic induction leads to loss of sympathetic tone and reduced venous return which can trigger immediate collapse**
 - Pre-induction optimization including volume status assessment and invasive hemodynamic monitoring is essential
- **Patient required 3L fluids and triple vasopressor therapy intraoperatively**
 - Consider pre-induction fluid bolus and vasopressors to stabilize hemodynamics and prevent collapse
- **Immediate cardiovascular collapse occurred despite using etomidate**
 - Concurrent propofol use likely contributed to instability through its vasodilatory effects
 - The combination of etomidate and ketamine may have provided more hemodynamic stability
- **Abdominal compartment syndrome compromises respiratory mechanics**
 - Low tidal volumes (6–8 mL/kg) and permissive hypercapnia are recommended
- **Surgical decompression reverses respiratory failure but may trigger physiologic shifts such as alkalosis, hypotension, and arrhythmias**
 - Physiologic shifts may result from washout of anaerobic metabolites and a rapid drop in systemic vascular resistance
 - These risks can be mitigated with close respiratory monitoring and pre-decompression fluid bolus
 - Large-bore IV access and massive transfusion readiness are recommended due to risk of significant blood loss and fluid shifts during decompression