

CLINICAL IMAGE

Severe abdominal compartment syndrome

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Keywords - abdominal compartment syndrome**Case**

A 73-year-old patient called his general practitioner because of sudden acute abdominal pain. The pain became worse and he eventually collapsed. He was transferred to the emergency room (ER) by ambulance. Upon arrival at the ER, he was pale, diaphoretic, hypotensive and tachycardic. Physical examination revealed a swollen tense abdomen. Abdominal ultrasound and CT scan showed a ruptured aneurysm of the abdominal aorta. He underwent emergency surgical repair with an aortic endoprosthesis. During the operation the patient developed haemorrhagic shock and was extensively resuscitated with crystalloids, multiple red blood cell and plasma transfusions, coagulation products and vasopressors. Perioperatively,

the patient developed severe oedema of the bowel and retroperitoneum which prevented primary closure. A temporary abdominal closing negative pressure system (ABThera) was placed to allow the viscera to extrude from the peritoneal cavity and to prevent abdominal compartment syndrome (*figure 1*).



Figure 1. Severe abdominal compartment syndrome, with intra-abdominal pressure of 45 mmHg despite ABThera



Figure 2A. Abdomen after removal of ABThera, intestine covered with OPSITE low vacuum system



Figure 2B. Abdomen after removal of ABThera, intestine covered with OPSITE low vacuum system

After surgery, the patient was admitted to the intensive care unit. He was sedated and paralysed to reduce abdominal pressure. Despite the ABThera, the patient developed progressively higher intra-abdominal pressures (IAP 45 mmHg), lactic acidosis and kidney failure within four hours, indicating abdominal compartment syndrome. The ABThera was surgically removed and inspection of the intestine showed rectosigmoid ischaemia, which was resected. The abdomen was closed with a see-through water-resistant low vacuum system (OPSITE). Due to the severe bowel oedema the intestines were extruded out of the abdominal cavity and were clearly visible for inspection (*figure 2*). The IAP decreased to <20 mmHg. Continuous venovenous haemofiltration was started for forced fluid removal to reduce bowel oedema and IAP. However, the patient developed progressive multi-organ failure not responding to treatment and eventually died.

Abdominal compartment syndrome

Abdominal compartment syndrome occurs when the abdomen becomes subject to increased pressure. Primary abdominal compartment syndrome is caused by intra-abdominal pathology, i.e. pancreatitis or severe haemorrhage caused by trauma or ruptured aneurysm. In contrast, secondary abdominal compartment syndrome is caused by conditions outside the abdominopelvic region. Increasing pressure reduces blood flow

to abdominal organs and impairs pulmonary, cardiovascular, renal, and gastrointestinal function, causing multiple organ dysfunction syndrome and death. Raised intra-abdominal pressure (IAP >20 mmHg) coupled with evidence of organ dysfunction constitutes abdominal compartment syndrome. The normal IAP in the resting, supine patient is below 10 mmHg. An IAP \geq 12 mmHg is referred to as intra-abdominal hypertension. The treatment of intra-abdominal hypertension is based on five principles: 1) improvement of abdominal wall compliance, 2) evacuation of intraluminal contents, 3) evacuation of abdominal fluid collections, 4) correction of capillary leak and positive fluid balance, and 5) specific treatment to support end-organ function.^[1] Decompressive abdominal surgery is required when medical treatment options fail to improve IAP. If not timely recognised and treated, abdominal compartment syndrome can lead to serious organ failure and even death.

Disclosures

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References

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