A logical approach to trauma - Damage control surgery: Comments

Sir,

I would like to congratulate the authors for their excellent review article on Damage Control Surgery.[1]

I would also like to emphasize a few points regarding Abdominal Compartment Syndrome (ACS), the clinical diagnosis of which is difficult and prognosis

dismal.

ACS was first suggested by Baggot in 1951, although the concept has only become widely accepted in the past 20 years.[2] As rightly stated by the authors, there is a compromise of cardiorespiratory and renal function in ACS despite adequate resuscitation and ventilation.

Apart from the causes of raised intra-abdominal pressure (IAP) listed in Table 5 in the article,[1] ACS can develop within 12 hours of intensive care unit admission in high-risk (shock, burn, pancreatitis, postabdominal aortic surgery) patients.[3] The risk of developing ACS increases with an increase in the Injury Severity Score.[2] Aggressive resuscitation to correct tissue hypoperfusion within 24 hours of injury is associated with improved clinical outcomes. Massive resuscitations, however, are associated with specific complications such as hypothermia, coagulopathy, and ACS. Intra-abdominal hypertension triggers bacterial translocation and multiple organ system failure.

Recent studies have shown that a clinical estimation of IAP by abdominal girth or by examiner's feel of the tenseness of the abdomen is far from accurate, with a sensitivity of around 40%.[4] CT scan findings showing compression of the IVC, round belly sign (ratio of anteroposterior to transverse abdominal diameter greater than 0.8) and ascites or hemoperitoneum may be indicators of raised IAP, as is low gastric mucosal pH^2. Continuous IAP measurement with a three-way urinary catheter is a simple and accurate method for monitoring IAP.[3]

Currently there is no agreed definition or management of ACS. However, it is suggested that IAP should be measured in patients at risk, with values above 20 mmHg being considered abnormal in most. Abdominal decompression should be considered in patients with rising pressure and organ dysfunction, indicated by increased airway pressure, reduced cardiac output and oliguria. Organ dysfunction often occurs at an IAP greater than 35 mmHg and may start to develop between 26 and 35 mmHg. The mean survival rate of patients affected by compartment syndrome is 53%. The optimal time for intervention is not known, but outcome is often poor, even after decompression.[5]

The abdominal wound is often left open following decompression laparotomy to prevent further development of ACS. Temporary measures of closure include use of mesh, plastic bag, fascial closure, plastic or silicone sheets, vacuum pack or only skin clips to approximate skin while leaving muscle and fascia open. Mesh is difficult to remove later and ventral hernia and bowel fistula might further complicate the process. Omentum may be placed at the base of the wound which is then covered with sterile plastic or silicone sheets.[2]

Besides the deleterious effects mentioned in the article,[1] abdominal decompression and temporary closure could itself lead to significant fluid loss, often exceeding several litres. If a plastic bag is used, it is important either to have suction drain to remove the fluid or a plastic stoma bag placed over a perforation in the plastic. This should be attached to a closed drainage system.[2]

Lastly, octreotide, a synthetic somatostatin analogue, is being investigated for its therapeutic role as a "reperfusion injury-limiting" agent in raised IAP-induced abdominal organ injury that might follow abdominal decompression. Recent studies indicate that increased IAP causes oxidative organ damage and octreotide, by controlling the reperfusion of abdominal organs and inhibiting neutrophil infiltration, could improve the reperfusion-induced oxidative damage.[6]

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