INTRA-ABDOMINAL HYPERTENSION (IAH) ASSESSMENT ALGORITHM



IAH - intra-abdominal hypertension ACS - abdominal compartment syndrome IAP - intra-abdominal pressure

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management algorithm.

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deteriorates clinically.

INTRA-ABDOMINAL HYPERTENSION (IAH) / ABDOMINAL COMPARTMENT SYNDROME (ACS) MANAGEMENT ALGORITHM



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IAH / ACS MEDICAL MANAGEMENT ALGORITHM

- The choice (and success) of the medical management strategies listed below is strongly related to both the etiology of the patient's IAH / ACS and the patient's clinical situation. The appropriateness of each intervention should always be considered prior to implementing these interventions in any individual patient.
- The interventions should be applied in a stepwise fashion until the patient's intra-abdominal pressure (IAP) decreases.
- If there is no response to a particular intervention, therapy should be escalated to the next step in the algorithm.



Step 4

If IAP > 25 mmHg (and/or APP < 50 mmHg) and new organ dysfunction / failure is present, patient's IAH / ACS is refractory to medical management. Strongly consider surgical abdominal decompression.

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Intra-Abdominal Pressure Monitoring Algorithm

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Intra-abdominal Pressure Monitoring Algorithm

- 1. Macalino JU, Goldman RK, Mayberry JC. Medical management of abdominal compartment syndrome: case report and a caution. Asian J Surg 2002; 25:244-6.
- 2. Malbrain ML, Chiumello D, Pelosi P, et al. Prevalence of intra-abdominal hypertension in critically ill patients: a multicentre epidemiological study. Intensive Care Med 2004.
- 3. Malbrain ML. Abdominal pressure in the critically ill. Curr Opin Crit Care 2000; 6:17-29.
- 4. Gecelter G, Fahoum B, Gardezi S, Schein M. Abdominal compartment syndrome in severe acute pancreatitis: an indication for a decompressing laparotomy? Dig Surg 2002; 19:402-4; discussion 404-5.
- 5. Tao HQ, Zhang JX, Zou SC. Clinical characteristics and management of patients with early acute severe pancreatitis: experience from a medical center in China. World J Gastroenterol 2004; 10:919-21.
- 6. Katz R, Meretyk S, Gimmon Z. Abdominal compartment syndrome due to delayed identification of a ureteral perforation following abdomino-perineal resection for rectal carcinoma. Int J Urol 1997; 4:615-7.
- 7. Madl C, Druml W. Gastrointestinal disorders of the critically ill. Systemic consequences of ileus. Best Pract Res Clin Gastroenterol 2003; 17:445-56.
- 8. Lohlun J, Margolis M, Gorecki P, Schein M. Fecal impaction causing megarectum-producing colorectal catastrophes. A report of two cases. Dig Surg 2000; 17:196-8.
- 9. Sullivan KM, Battey PM, Miller JS, McKinnon WM, Skardasis GM. Abdominal compartment syndrome after mesenteric revascularization. J Vasc Surg 2001; 34:559-61.
- 10. Aspesi M, Gamberoni C, Severgnini P, et al. The abdominal compartment syndrome. Clinical relevance. Minerva Anestesiol 2002; 68:138-46.
- 11. Latenser BA, Kowal-Vern A, Kimball D, Chakrin A, Dujovny N. A pilot study comparing percutaneous decompression with decompressive laparotomy for acute abdominal compartment syndrome in thermal injury. J Burn Care Rehabil 2002; 23:190-5.
- 12. O'Mara MS, Semins H, Hathaway D, Caushaj PF. Abdominal compartment syndrome as a consequence of rectus sheath hematoma. Am Surg 2003; 69:975-7.
- 13. Dabney A, Bastani B. Enoxaparin-associated severe retroperitoneal bleeding and abdominal compartment syndrome: a report of two cases. Intensive Care Med 2001; 27:1954-7.
- 14. Ivatury RR, Porter JM, Simon RJ, Islam S, John R, Stahl WM. Intra-abdominal hypertension after life-threatening penetrating abdominal trauma: prophylaxis, incidence, and clinical relevance to gastric mucosal pH and abdominal compartment syndrome. J Trauma 1998; 44:1016-21; discussion 1021-3.
- 15. Mayberry JC, Mullins RJ, Crass RA, Trunkey DD. Prevention of abdominal compartment syndrome by absorbable mesh prosthesis closure. Arch Surg 1997; 132:957-61; discussion 961-2.
- Lacey SR, Carris LA, Beyer AJ, 3rd, Azizkhan RG. Bladder pressure monitoring significantly enhances care of infants with abdominal wall defects: a prospective clinical study. J Pediatr Surg 1993; 28:1370-4; discussion 1374-5.
- 17. Jona JZ. The 'gentle touch' technique in the treatment of gastroschisis. J Pediatr Surg 2003; 38:1036-8.
- 18. Rizzo A, Davis PC, Hamm CR, Powell RW. Intraoperative vesical pressure measurements as a guide in the closure of abdominal wall defects. Am Surg 1996; 62:192-6.
- 19. von Gruenigen VE, Coleman RL, King MR, Miller DS. Abdominal compartment syndrome in gynecologic surgery. Obstet Gynecol 1999; 94:830-2.
- 20. McNelis J, Soffer S, Marini CP, et al. Abdominal compartment syndrome in the surgical intensive care unit. Am Surg 2002; 68:18-23.
- 21. Fietsam R, Jr., Villalba M, Glover JL, Clark K. Intra-abdominal compartment syndrome as a complication of ruptured abdominal aortic aneurysm repair. Am Surg 1989; 55:396-402.
- 22. Papavassiliou V, Anderton M, Loftus IM, et al. The physiological effects of elevated intra-abdominal pressure following aneurysm repair. Eur J Vasc Endovasc Surg 2003; 26:293-8.
- 23. Loftus IM, Thompson MM. The abdominal compartment syndrome following aortic surgery. Eur J Vasc Endovasc Surg 2003; 25:97-109.
- 24. Biffl WL, Moore EE, Burch JM, Offner PJ, Franciose RJ, Johnson JL. Secondary abdominal compartment syndrome is a highly lethal event. Am J Surg 2001; 182:645-8.
- 25. Balogh Z, McKinley BA, Holcomb JB, et al. Both primary and secondary abdominal compartment syndrome can be predicted early and are harbingers of multiple organ failure. J Trauma 2003; 54:848-59; discussion 859-61.
- Ertel W, Oberholzer A, Platz A, Stocker R, Trentz O. Incidence and clinical pattern of the abdominal compartment syndrome after "damage-control" laparotomy in 311 patients with severe abdominal and/or pelvic trauma. Crit Care Med 2000; 28:1747-53.
- 27. Balogh Z, McKinley BA, Cocanour CS, et al. Supranormal trauma resuscitation causes more cases of abdominal compartment syndrome. Arch Surg 2003; 138:637-43.
- 28. Raeburn CD, Moore EE, Biffl WL, et al. The abdominal compartment syndrome is a morbid complication of postinjury damage control surgery. Am J Surg 2001; 182:542-6.
- 29. Maxwell RA, Fabian TC, Croce MA, Davis KA. Secondary abdominal compartment syndrome: an underappreciated manifestation of severe hemorrhagic shock. J Trauma 1999; 47:995-9.
- 30. Kopelman T, Harris C, Miller R, Arrillaga A. Abdominal compartment syndrome in patients with isolated extraperitoneal injuries. J Trauma 2000; 49:744-7; discussion 747-9.
- 31. Ivy ME, Possenti PP, Kepros J, et al. Abdominal compartment syndrome in patients with burns. J Burn Care Rehabil 1999; 20:351-3.
- 32. Hobson KG, Young KM, Ciraulo A, Palmieri TL, Greenhalgh DG. Release of abdominal compartment syndrome improves survival in patients with burn injury. J Trauma 2002; 53:1129-33; discussion 1133-4.
- 33. Ivy ME, Atweh NA, Palmer J, Possenti PP, Pineau M, D'Aiuto M. Intra-abdominal hypertension and abdominal compartment syndrome in burn patients. J Trauma 2000; 49:387-91.
- 34. Tsoutsos D, Rodopoulou S, Keramidas E, Lagios M, Stamatopoulos K, Ioannovich J. Early Escharotomy as a Measure to Reduce Intraabdominal Hypertension in Full-Thickness Burns of the Thoracic and Abdominal Area. World J Surg 2003.
- 35. Corcos AC, Sherman HF. Percutaneous treatment of secondary abdominal compartment syndrome. J Trauma 2001; 51:1062-4.
- 36. Sharpe RP, Pryor JP, Gandhi RR, Stafford PW, Nance ML. Abdominal compartment syndrome in the pediatric blunt trauma patient treated with paracentesis: report of two cases. J Trauma 2002; 53:380-2.
- 37. De Waele, J. J., D. Benoit, et al. (2003). "A role for muscle relaxation in patients with abdominal compartment syndrome?" Intensive Care Med 29(2): 332.
- 38. Gorecki PJ, Kessler E, Schein M. Abdominal compartment syndrome from intractable constipation. J Am Coll Surg 2000;190:371.
- 39. Kula, R., P. Szturz, et al. (2004). "A role for negative fluid balance in septic patients with abdominal compartment syndrome?" Intensive Care Med.
- 40. Vachharajani, V., L. S. Keith, et al. (2003). "Medical Management Of Severe Intra-abdominal Hypertension With Aggressive Diuresis And Continuous Ultra-filtration." <u>The Internet Journal of Emergency and Intensive Care Medicine</u> 6(2): http://www.ispub.com/ostia/index.php?xmlFilePath=journals/ijeicm/vol6n2/ultra.xml.
- 41. Malbrain MLNG, Nieuwendijk R, Verbrugghe W, Deeren D, Darquennes K, Daelemans R, Lins R. Effect of intra-abdominal pressure on pleural and filling pressures. Intensive Care Med 2003; 29:S73.
- 42. Hering R, Rudolph J, Spiegel Tv, Minor T, Hirner A, Hoeft A. Cardiac filling pressures are inadequate for estimating circulatory volume in states of elevated intraabdominal pressure. Intensive Care Med 1998; 24:S409.
- 43. Durham R, Neunaber K, Vogler G, et al. Right ventricular end-diastolic volume as a measure of preload. J Trauma 1995; 39:218-224.
- 44. Cheatham, M. L., M. W. White, et al. (2000). "Abdominal perfusion pressure: a superior parameter in the assessment of intra-abdominal hypertension." J Trauma 49(4): 621-6.