

Vol 39, 2012 HAEMOPERITONEUM.

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Mesenteric, retroperitoneal, peritoneal bleeding are usually due to trauma, anticoagulants, post surgery and Aneurysmal bleeding. Traumatic hematomas may or may not require surgical intervention, depending on the site of the lesion and whether the trauma was blunt or penetrating.¹

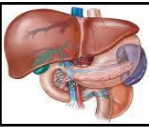
Tumor-associated hemorrhage, which most often occurs in Hepatocellular carcinoma, hepatic adenoma, or vascular metastatic disease, also may produce hemoperitoneum. Vascular lesions (visceral artery aneurysms and pseudo aneurysms) that occur in systemic vascular diseases such as Ehlers-Danlos syndrome or in pancreatitis are another less common source of hemoperitoneum.

Symptoms usually are abdominal pain and distension .Physical examination can be misleading in up to 45% of patients with blunt abdominal trauma.²

Blunt or penetrating trauma is still one of the major causes of hemoperitoneum. Careful integration of physical examination and certain diagnostic procedures, notably local wound exploration (LWE), diagnostic peritoneal lavage (DPL), ultrasonography (US), computed tomography (CT), and laparoscopy, now provides the emergency Pediatrician and Pediatric surgeon with an accurate means of determining whether laparotomy should be undertaken. The approach varies according to the clinical status of the patient, the instrument responsible for injury, and the site of penetration.

The **small intestine**, colon, and liver are, successively, the most likely organs to sustain injury after penetrating trauma.⁴ The **spleen is the organ most often injured, and in nearly two thirds of blunt trauma cases**, (intraperitoneal structure). The liver is the second most commonly blunt trauma injured intra-abdominal organ, and the intestine is the most likely hollow viscus to be damaged. A child's abdomen has less developed musculature and a relatively smaller anteroposterior diameter increasing the vulnerability of a child's abdominal contents to compression between a blunt anterior force and the solid posterior vertebrae. The rib cage is extremely compliant in children and less prone to fractures but nonetheless provides only partial protection against splenic and hepatic injuries.

Motor vehicle crashes are responsible for most of the morbidity and mortality in cases of trauma in children.³ child abuse mostly missed but common and extremely harmful cause of haemoperitoneum post abdominal injuries .Possibility of Coagulopathies (e.g., hemophilia) contributing to the pathologic condition and complicating therapy after apparent minor trauma to the abdomen should be considered in relevant cases.



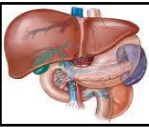
Diagnosis depends on a high index of clinical suspicion and ultrasonography or CT, which demonstrates the collection of blood.

An ultrasound-guided fine-needle aspiration may help in confirming the diagnosis. Diagnostic peritoneal lavage (DPL) is a procedure that consists of two components. The first part involves the attempt to aspirate any free blood that may be present in the peritoneal cavity. If this initial portion of the procedure reveals hemoperitoneum, the test is considered positive and the remainder of the procedure is aborted. If no free blood is obtained during the initial aspiration, the second portion of the procedure is conducted. This involves the introduction of normal saline or lactated Ringer's into the peritoneal cavity. The instilled fluid is subsequently drained from the peritoneal cavity and analyzed; results may ultimately indicate the nature of the intra-abdominal pathology. **DPL continues to be an important diagnostic tool in patients with blunt abdominal trauma who are hemodynamically unstable and for whom bedside ultrasonography is not available or they cannot be transported safely from the emergency department for imaging studies.** DPL also serves as an adjunct in the evaluation of the patient with penetrating trauma. **Acute abdomen requiring immediate surgery is the only absolute contraindication.**

Diagnostic peritoneal lavage:2

Decompress the stomach and bladder. Prepare the abdominal skin at the puncture site with standard preparation solutions. The ideal site is immediately inferior to the umbilicus . Patients with prior lower abdominal surgery, or patients with pelvic fractures may use suprumbilical approach. Infiltrate the skin, subcutaneous tissues, and fascia with lidocaine with epinephrine. Applying negative pressure on the syringe, insert the needle through the skin and directly into the peritoneal space. “pops” are felt as the needle penetrates the skin, the fascia, and the peritoneum. If blood is aspirated during this step, it is considered a positive result. If not, proceed to guide wire is then introduced through the needle, until only 7 to 10 cm of the guidewire remains outside the needle ,post guidewire removal peritoneal catheter may be introduced. Attach the syringe to the catheter and attempt to withdraw fluid. If more than 10 mL of blood is obtained, the patient may be prepared for emergent laparotomy. If the tap is dry, proceed to peritoneal lavage. Connect the IV tubing and infuse lactated Ringer's solution or normal saline. The amount infused is 15 mL/kg The infused fluid is then removed by placing the IV bag on the floor and allowing the fluid to return by gravity. The fluid should return at a steady rate of flow. If this flow is interrupted, it is probably due to omentum blocking the holes in the catheter. Placing pressure on the patient's abdomen may increase the flow; alternatively, the catheter may need to be withdrawn slightly and reinserted. After the fluid is removed, gently remove the catheter and apply pressure to the wound.

Findings of more than 100,000 RBCs/mm³ are also considered positive (half these numbers if 2 L of fluid were infused). Findings of 20,000/mm³ to 100,000/mm³ RBCs should be considered equivocal. In these patients an observation period of 12 to 24 hours should be



considered with haemodynamic continuous assessment. A WBC count greater 500 cells/mm³ is also considered a positive test and warrants laparotomy. Amylase may be elevated when there is injury to the gastrointestinal tract; however, a positive amylase test is neither sensitive nor specific.

The amount of peritoneal effusion can be quantified using the Federle score⁵ by counting the number of compartments affected by the spread of blood. Seven compartments are considered in the peritoneal cavity: Morison's pouch, perihepatic space, perisplenic space, 2 pericolic gutters, floating intestinal loops and the Douglas pouch. A haemoperitoneum is minimal if 1 compartment is affected by the effusion, moderate if 2 compartments are affected and large if 3 or more compartments are affected. On CT images, the highest-attenuation hematoma, or sentinel clot, is that closest to the site of bleeding, whereas lower-attenuation unclotted blood is located farther from the source. The sentinel clot sign is useful for identifying the dominant source of hemoperitoneum in patients with multiple injuries from trauma. Although in many cases hemoperitoneum can be managed nonsurgically with excellent results a CT finding of active bleeding is indicative of a need for emergent embolization or surgical treatment (January 2007 RadioGraphics, 27,109-125.)

In a recent study, the predictive value of large haemoperitoneum has been validated to define the needs for laparotomy (haemostatic procedure or not) in hypotensive blunt trauma patients, using the FAST strategy.⁷

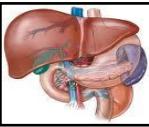
The assessment of the size of hemo-peritoneum on admission substantially improves the prediction of massive transfusion in trauma patients and should be used to trigger and guide initial haemostatic resuscitation.⁸

In severe blunt trauma patients who are at risk of having several exsanguinating injuries, a diagnosis of haemoperitoneum is not inevitably associated with a peritoneal bleed, even in the presence of haemorrhagic shock. ⁶ To localise the haemorrhagic source in bleeding blunt trauma patients, the size of the haemoperitoneum can be useful: a large haemoperitoneum favours Peritoneal bleed .

One of reported studies conclude that A computed tomography angiography should be performed on patients with intra-abdominal abscess formation and sentinel bleed after pancreatic and biliary surgery to check if a pseudoaneurysm has formed.⁹

Abdominal apoplexy, or the newer term, idiopathic spontaneous intraperitoneal hemorrhage (ISIH), represents a rare cause of non-traumatic intra-abdominal bleeding.

Treatment of spontaneous intraperitoneal bleeding, as with other bleeding phenomena, revolves around resuscitation and correction of the underlying problem.¹⁰

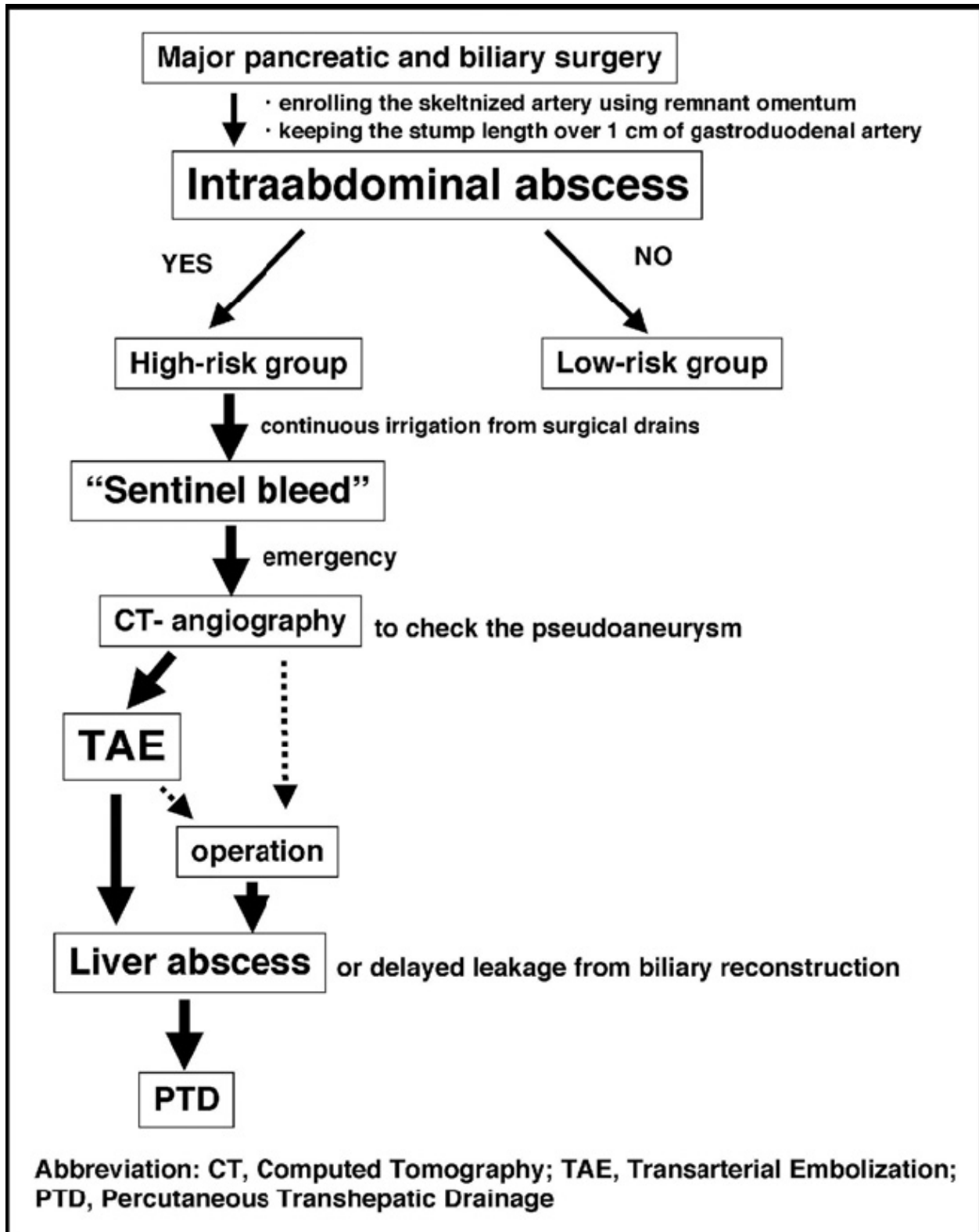
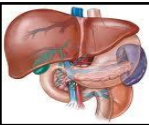


Nonoperative management (NOM) is the treatment of choice for hemodynamically stable pediatric patients with spleen or liver trauma. The management of splenic and hepatic injury in children should not only be based on the physiologic response but should include consideration of the presence of a contrast blush. Despite the current low level of evidence on failure rate of NOM when a contrast blush is present on CT, significant number of patients in whom NOM fails in a metaanalysis by Vnader viles etal. The "blush sign" is an active pooling of contrast material within or around the spleen/organ seen during intravenous enhanced computed tomography (CT) scan. (J Pediatr Surg. 2010 May;45(5):1044-9. doi:10.1016/j.jpedsurg.2010.01.002.)

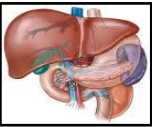
Judicious Treatment of underlying cause is important .Emergency relief of abdominal compartment syndrome may be required.

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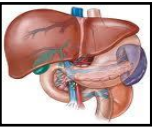
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