

Penetrating abdominal trauma – clinical view

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Significant abdominal organ injury can be defined as a full-thickness perforation of the gastrointestinal, biliary or urinary tract or of the diaphragm, injury penetrating the pancreatic capsule, active bleeding from the liver, spleen, kidney, greater omentum or mesentery requiring placement of sutures or other hemostatic procedures, and lacerations of major vessels or the mesentery requiring sutures or causing irreversible peripheral organ ischemia.

Risk of significant organ injury in abdominal stab wounds

Anterior stab wounds	40-50%
With peritoneal violation	60-70%
Equivocal peritoneal violation	7%
Peritoneum intact on LWE	0%
Stab wound of the flank	20-30%
Posterior stab wound	7-15%
Thoracoabdominal stab wound	15%
Occult diaphragmatic injury	7%
Right side	3%
Left side	17%

LWE = local wound exploration

The management of patients with anterior abdominal stab wounds or stab wounds of the flanks consists of a series of key decisions. Nonoperative management of patients with a low risk of a significant injury is safe and reduces nontherapeutic laparotomies and associated morbidity. If an intact anterior fascia can be seen during local wound exploration, the patient can be discharged, whereas equivocal findings warrant expectant observation. Early laparotomy is warranted in patients with overt signs of intraperitoneal, retroperitoneal or gastrointestinal tract bleeding, or with generalized peritonitis. In patients with demonstrated peritoneal violation (visible peritoneal violation during local wound exploration, evisceration, intraperitoneal fluid on ultrasound or free extraluminal air on plain x-rays), the risk of a significant organ injury is sufficiently high to justify early exploration, although a more conservative approach may be applied in asymptomatic patients. The role of computed tomography is not clear, whereas the benefits of laparoscopy in excluding diaphragmatic perforations especially after left thoracoabdominal stab wounds have been demonstrated.

Stab wounds of the back, unless the patient is bleeding or has peritonitis, are best evaluated with a CT scan of the torso. If the wound tract extends to the retroperitoneum and especially near the retroperitoneal parts of the colon, duodenum or pancreas, a low threshold for operative exploration is justified. If the wound tract clearly stops in the muscle layer and there is not major hemorrhage, the patient can be discharged after wound care. In equivocal cases, expectant management with an observation period of at least 24 hours is warranted.

About 90% of the patients abdominal gunshot wounds have organ injuries requiring surgical repair. In most centers, a policy of mandatory laparotomy is used. In high-volume centers, selective nonoperative management can be utilized provided that the patient undergoes serial clinical observation. CT scans are helpful in characterizing organ injuries,

especially of the solid abdominal organs. Shotgun injuries from close range require virtually always surgical exploration. Low velocity tangential gunshot wounds not penetrating the peritoneum can be managed with wound debridement without extending the wound intraperitoneally.