

Abdominal Stab Wound Exploration

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Introduction

In the 19th century, penetrating abdominal wounds were managed nonoperatively. The associated morbidity and mortality rates were greater than 70%.¹ Experience gained during World War I, World War II, and the Korean Conflict led to an aggressive approach of operative management for all penetrating abdominal wounds.² This approach resulted in an unacceptably high frequency of laparotomy with findings negative for trauma. In 1960, Shaftan developed an approach of selective conservatism for penetrating abdominal injury and revolutionized abdominal stab wound management.³

The optimal method to determine the need for laparotomy has yet to be definitively established. Abdominal stab wound exploration forms part of a strategy developed by surgeons to allow a more selective approach. In asymptomatic patients with stab wounds to the anterior abdomen, 2 methods are widely used to help determine the need for laparotomy:

- Abdominal stab wound exploration (Subsequent diagnostic peritoneal lavage [DPL], serial clinical evaluation, or both are used to further assess patients in whom an exploration cannot definitively exclude peritoneal penetration.)
- Serial clinical evaluation

The objective is to reduce the number of patients with trivial or no intraperitoneal injury who are subjected to laparotomy. However, a high degree of diagnostic accuracy must be maintained to limit the frequency of missed injury. A reduction in unnecessary hospitalization is also targeted.

Investigators in this field are continuing to study other protocols and investigative tools. No protocol is currently universally accepted. Other modalities that have been studied include DPL alone, laparoscopy, CT, and ultrasonography. These strategies of [selection for laparotomy](#) are explored in greater detail below.

Abdominal stab wound exploration is a safe, rapid, and cost-effective tool in the management of asymptomatic patients who present with an anterior abdominal stab wound.⁴ This approach has no place in the treatment of patients who are unstable, who have peritonitis, or who have evisceration. Patients with peritonitis and those

who are hemodynamically unstable should undergo mandatory laparotomy.

More than 25% of anterior abdominal stab wounds do not penetrate the peritoneal cavity.^{5,6} Local wound exploration allows the safe discharge of these patients from the emergency department. Only half of the wounds that penetrate the peritoneum cause damage that requires surgical intervention.^{1,7} The organs most commonly injured with anterior abdominal stab wounds are the small bowel, the liver, and the colon. Missed hollow viscus injuries are associated with significant morbidity and mortality.

The authors advocate abdominal stab wound exploration in asymptomatic patients who present with an anterior abdominal stab wound. An exploration with negative findings is reliable and highly sensitive. Abdominal stab wound exploration combined with further investigation, such as DPL or serial evaluation, achieves acceptable specificity rates. Minimizing the time taken to control ongoing intraperitoneal contamination is critical in [penetrating stab wounds](#), and local exploration is a valuable first step in speeding up the decision-making process. When combined with DPL, abdominal stab wound exploration allows significant injuries that are not immediately apparent to be identified early.

Wound exploration can be performed successfully by surgeons or ED personnel who are trained in the procedure. This strategy aids with patient flow through a busy emergency department.



Flow chart illustrating the management options in patients with a stab wound to the anterior abdomen. Red arrows highlight an approach that favors abdominal stab wound exploration.

Anatomy

An appreciation of the anatomy of the anterior abdominal wall at different levels is essential to understanding the procedure. The differences are highlighted in red on the diagrams below.



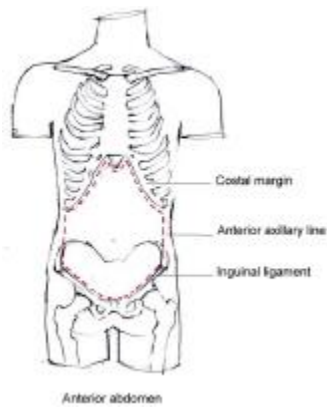
Transverse section of the anterior abdominal wall above the arcuate line.



Transverse section of the anterior abdominal wall below the arcuate line.

Boundaries of the anterior abdomen:

- Costal margins (superior)
- Inguinal ligaments (inferior)
- Anterior axillary lines (lateral)



Boundaries of the anterior abdominal wall.

Indications

Abdominal stab wound exploration is indicated in a patient who presents with a stab wound to the anterior abdomen, normal vital signs, no signs of [peritonitis](#), and no evidence of evisceration.



Stab wound to the anterior abdomen.

Some authors advocate local exploration of wounds only anterior to the midaxillary line. If the wound tracks anteriorly and the end point of the tract is not accurately determined, the patient undergoes diagnostic peritoneal lavage (DPL). If the wound tracks posteriorly and is not obviously superficial, the patient is investigated as for a penetrating flank wound. This often involves a triple-contrast CT scan.⁸

Special circumstances involve patients with additional injuries that require operative intervention and cases in which the offending weapon or object is retained.

- If the patient has additional injuries that require operative intervention, a wound exploration may be performed in the operating room before the other procedure is commenced.
- If the object has been retained and the surgeon strongly suspects that the peritoneum has not been breached, the object may be removed in the operating room and the wound locally explored. In such cases, the surgeon should be prepared to immediately convert to laparotomy, if necessary.

Contraindications

Abdominal stab wound exploration is contraindicated if immediate laparotomy is indicated. The situations in which immediate laparotomy is indicated include the following:

- Unstable patient
- Peritonitis
- Evisceration (This remains controversial; see paragraph 3 in [Selecting Candidates for Laparotomy](#) section.)
- Blood on rectal examination or blood in [nasogastric tube](#) aspirate suggests intra-abdominal injury (A low threshold for operative intervention is suggested.)

Other contraindications to abdominal stab wound exploration include the following:

- Lower chest wounds: Exploration of these wounds carries a high risk of iatrogenic [pneumothorax](#).
- Flank and back wounds: Some authors advocate exploration of these wounds if they are suspected to be superficial. However, this expectation may be unreliable, and the strong musculature makes the tract difficult to predict or to follow. Local wound exploration may result in further injury or a restart of hemorrhage that had stopped.
- Patient refusal or uncooperative patient.

Relative contraindications include the following:

- [Obesity](#)
- Multiple abdominal stab wounds

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