AAST Acute Care Surgery Didactic Curriculum

Penetrating Abdominal Trauma

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Highlights:

- Diffuse peritonitis, evisceration, and hemodynamic instability mandate operative intervention
- Abdominal gunshot wounds, excluding tangential, extraperitoneal tracts, have high incidence of injuries requiring operative intervention
- Selective nonoperative intervention can be undertaken for anterior abdominal stab wounds in hemodynamically stable patients without peritonitis
- CT scan with IV contrast can assist in selection of patients for nonoperative management and in the evaluation of patients with back and flank stab wounds
- In patients with hollow viscus injury, antibiotics should be continued for no longer than 24 hours

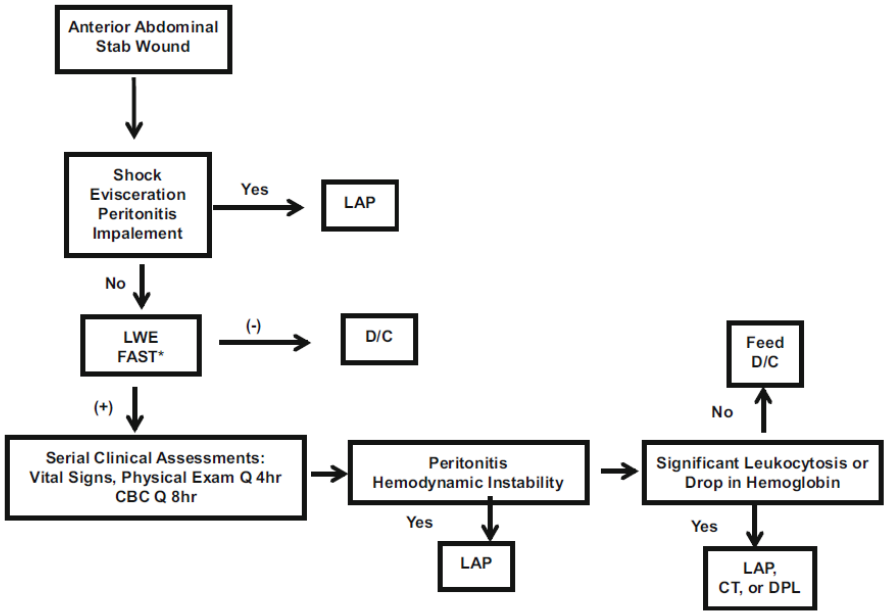
Overview

- Treatment of penetrating abdominal wounds has been the subject of much debate and investigation
- Proponents of mandatory exploration vs conservative management have each had their prominence throughout history
- Much of our understanding of selective nonoperative management of abdominal stab wounds was pioneered in South Africa
- When evaluating abdominal penetrating injury, the modality of the injury is important and affects the decision making algorithm
- Stab vs Gunshot wound vs Shotgun present unique diagnostic and treatment challenges
- Selection of patients needing operative intervention over selective nonoperative management is important as those undergoing nontherapeutic laparotomy have an increase in length of stay, complications, and cost
- Studies have shown only 50-75% of anterior abdominal stab wounds violate the peritoneum, and of these, only 50-75% are found to have significant injury
- Majority of injuries manifest signs of injury immediately or within first 24 hours
- Experience and resources of treating facility and personnel
- Patients may safely be discharged after 24 hours if they remain hemodynamically normal without peritoneal signs when undergoing serial abdominal exams for nonoperative management

Operative Management

- Regardless of mechanism of penetrating injury, hemodynamically unstable patients or diffuse peritonitis mandate operative exploration

- Location of injury can dictate treatment
- Thoracoabdominal stab wounds
    - Penetrating injuries can include both the chest, abdomen, and diaphragm
    - Instability presents challenge of choosing chest vs abdomen for initial approach
    - Use of diagnostic adjuncts including pericardial component of FAST, CXR, and CT scan will elucidate need for intervention ranging from tube thoracostomy to sternotomy
    - Penetrating diaphragmatic injuries can prove harder to diagnose than blunt rupture
        - Small injuries can prove elusive even on cross sectional imaging
    - In patients with concern for diaphragmatic injury, laparoscopy can be used to evaluate for and treat the injury if found
- Flank and back stab wounds
    - Physical exam may prove confounding in examination of retroperitoneal organs
    - Stable patients should undergo cross sectional imaging
    - Concerning findings, including evidence of colonic extravasation, pneumoperitoneum or free air in retroperitoneum outside of wound tract, and free intraperitoneal fluid should prompt operative exploration
- Anterior abdomen stab wounds
    - Most requiring intervention will present unstable, peritoneal, or become so shortly after presentation
    - Stable, asymptomatic patients are candidates for further imaging and selective nonoperative management
    - Delay to operative intervention for serial abdominal exams is not associated with increased morbidity
    - No operative intervention needed if peritoneum not violated
    - Peritoneal violation does not mandate operation in all patients
    - If local wound exploration is employed, must be thorough and complete, ie probing of wound to assess is an inadequate evaluation



- Abdominal gunshot wounds
    - Vast majority with peritoneal violation have injury requiring intervention
- Stable patients may be candidates for further imaging to assess bullet tract

- Tangential gunshot wounds without instability or peritonitis do not mandate operative exploration
- Extraperitoneal tracts may be safely discharge

Diagnostic Adjuncts
- In hemodynamically stable patients without diffuse peritonitis, cross sectional imaging should be considered for further diagnostic evaluation of both stab wounds and gunshot wounds
- Local wound exploration
    - Must be thorough and complete
    - Probing of wound inadequate
    - Definition of positive exploration debated (ie anterior fascia vs hematoma vs full thickness wound)
- Diagnostic peritoneal lavage
    - Less common now given advances in cross sectional imaging
- FAST exam
    - While useful in blunt trauma, utility in penetrating greatly diminished
    - Low sensitivity for meaningful intraabdominal injury
    - Negative FAST should not overrule hemodynamic instability or physical exam concerning for peritonitis indicating operative intervention
- CT scan
    - Proven useful in evaluating patients potentially suitable for selective nonoperative management
    - Enteric contrast does not increase diagnostic benefit for hollow viscus injury over IV contrast alone
    - Highly relied upon in flank and back stab wounds to evaluate retroperitoneal structures
    - In stable gunshot patients without peritonitis, can selectively be applied to evaluate for extraperitoneal bullet tract

Damage Control Laparotomy
- While once common practice, utility for damage control vs definitive laparotomy is now debated
- Damage control laparotomy has been associated with increased cost and length of stay
- Some association of DC laparotomy with increased morbidity
- Future research into appropriate patient selection for damage control operation needed
- **Prevention of SSI after trauma laparotomy**
- Penetrating abdominal trauma presents the possibility of contamination and infection with hollow viscus injury
- Standard single dose preoperative antibiotics should be given in all patients undergoing operative intervention
    - This should be broad spectrum and include anaerobic coverage
- Patients without hollow viscus injury do not require continued antibiotic coverage postoperatively
- In patients with hollow viscus injury, antibiotic coverage is not necessary for longer than 24 hours postoperatively