NICOLAY PIRIGOV
Russian Surgeon, founder of battlefield surgery
“A new era for surgery would become, if we will be able to stop the flow in a major artery without exploration, external compression and ligation...” (1864)
Non-operative management

Late 1800’s

Operative management

Late 1900’s

Non-operative management
Nonoperative Management of Hepatic, Splenic, and Renal Injuries in Adults with Multiple Injuries

Kenneth H. Sartorelli, MD, Carmine Frumiento, MD, Frederick B. Rogers, MD, and Turner M. Osler, MD

**Background:** Nonoperative management (NOM) of abdominal solid organ (ASO; liver, spleen, kidney) injuries from blunt trauma in adults has gained acceptance, but multisystem trauma remains a relative contraindication to NOM.

**Methods:** We reviewed the charts of 126 adult patients who underwent NOM of an ASO injury for success of NOM, transfusions, and complications. Patients were divided into two groups: group I had isolated ASO injuries (n = 48); group II had an ASO injury and at least one additional injury with an Abbreviated Injury Score ≥ 2 (n = 78).

**Results:** NOM was successful 89.6% of group I and 93.6% of group II patients (p = 0.55). Group II had higher Injury Severity Scores (20.7 ± 9.8 vs. 8.3 ± 4.9 p < 0.05) and transfusion requirements (30.8% vs. 14.6%, p < 0.05) than group I. Complication rates were not different (group I, 20.8% vs. 26.9% group II, p = 0.58).

**Conclusion:** NOM of ASO injuries may attempted in adult patients with multiple injuries without increased morbidity.

**Key Words:** Nonoperative management (NOM), Abdominal solid organ (ASO).


- Lower hospital cost
- Earlier discharge
- Fewer intra-abdominal complications
- Reduced transfusion rate
Nonoperative management of blunt hepatic injury: An Eastern Association for the Surgery of Trauma practice management guideline

Nicole A. Stassen, MD, Indermert Bhullar, MD, Julius D. Cheng, MD, Marie Crandall, MD, Randall Friese, MD, Oscar Guilamondegui, MD, Randeep Jawa, MD, Adrian Maung, MD, Thomas J. Rohs, Jr, MD, Ayodele Sangedunya, MD, Kevin Schuster, MD, Mark Seamon, MD, Kathryn M. Tchorz, MD, Ben L. Zarzaur, MD, and Andrew Kerwin, MD

BACKGROUND: During the last century, the management of blunt force trauma to the liver has changed from observation and expectant management in the early part of the 1990s to mainly operative intervention, to the current practice of selective operative and nonoperative management. Three issues were first addressed by the Eastern Association for the Surgery of Trauma in the Practice Management Guidelines for Nonoperative Management of Blunt Injury to the Liver and Splen published online in 2003. Since that time, a large volume of literature on these topics has been published requiring a reevaluation of the previous Eastern Association for the Surgery of Trauma (EAST) guideline. The National Library of Medicine and the National Institutes of Health MEDLINE database were searched using PubMed (www.pubmed.gov). The search was designed to identify English-language citations published after 1996 (the last year included in the previous guideline) using the keywords liver injury and blunt abdominal trauma.

RESULTS: One hundred seventy-six articles were reviewed, of which 94 were used to create the current practice management guideline for the selective nonoperative management of blunt hepatic injury. Conclusions:

Most original hepatic guidelines remained valid and were incorporated into the greatly expanded current guidelines as appropriate. Nonoperative management of blunt hepatic injuries currently in the treatment modality of choice in hemodynamically stable patients, irrespective of the grade of injury or patient age. Nonoperative management of blunt hepatic injuries should only be considered in an environment that provides capabilities for monitoring, serial clinical evaluations, and an operating room available for urgent laparotomy. Patients presenting with hemodynamic instability and peritonitis still warrant emergent operative intervention. Intravenous contrast enhanced computed tomography scan is the diagnostic modality of choice for evaluating blunt hepatic injuries. Repeat imaging should be guided by the patient’s clinical status. Adjunctive therapies like angiography, percutaneous drainage, endoscopy/endoscopic retrograde cholangiopancreatography and laparoscopy remain important adjuncts to nonoperative management of hepatic injuries. Despite the explosion of literature on this topic, many questions regarding nonoperative management of blunt hepatic injuries remain without conclusive answers in the literature. (J Trauma Acute Care Surg. 2013;75: S288–S303. Copyright © 2012 by Lippincott Williams & Wilkins)

KEY WORDS: Guideline; Liver; Hepatic; Blunt abdominal trauma; surgery.

Selective nonoperative management of blunt splenic injury: An Eastern Association for the Surgery of Trauma practice management guideline

Nicole A. Stassen, MD, Indermert Bhullar, MD, Julius D. Cheng, MD, Marie Crandall, MD, Randall S. Friese, MD, Oscar D. Guilamondegui, MD, Randeep S. Jawa, MD, Adrian A. Maung, MD, Thomas J. Rohs, Jr, MD, Ayodele Sangedunya, MD, Kevin M. Schuster, MD, Mark J. Seamon, MD, Kathryn M. Tchorz, MD, Ben L. Zarzaur, MD, and Andrew J. Kerwin, MD

BACKGROUND: During the last century, the management of blunt force trauma to the spleen has changed from observation and expectant management in the early part of the 1990s to mainly operative intervention, to the current practice of selective operative and nonoperative management. These issues were first addressed by the Eastern Association for the Surgery of Trauma (EAST) in the Practice Management Guidelines for Nonoperative Management of Blunt Injury to the Liver and Spleen published online in 2003. Since that time, a large volume of literature on these topics has been published requiring a reevaluation of the current EAST guideline. The National Library of Medicine and the National Institutes of Health MEDLINE database was searched using PubMed (www.pubmed.gov). The search was designed to identify English-language citations published after 1996 (the last year included in the previous guidelines) using the keywords splenic injury and blunt abdominal trauma.

RESULTS: One hundred seventy-six articles were reviewed, of which 125 were used to create the current practice management guideline for the selective nonoperative management of blunt splenic injury. Conclusions:

There has been a plethora of literature regarding nonoperative management of blunt splenic injuries published since the original EAST practice management guideline was written. Nonoperative management of blunt splenic injuries is now the treatment modality of choice in hemodynamically stable patients, irrespective of the grade of injury, patient age, or the presence of associated injuries. Its use is associated with a low overall morbidity and mortality when applied to an appropriate patient population. Nonoperative management of blunt splenic injuries should only be considered in an environment that provides capabilities for monitoring, serial clinical evaluations, and an operating room available for urgent laparotomy. Patients presenting with hemodynamic instability and peritonitis still warrant emergent operative intervention. Intravenous contrast enhanced computed tomographic scan is the diagnostic modality of choice for evaluating blunt splenic injuries. Repeat imaging should be guided by the patient’s clinical status. Adjunctive therapies like angiography, percutaneous drainage, and laparoscopy remain important adjuncts to nonoperative management of splenic injuries. Despite the explosion of literature on this topic, many questions regarding nonoperative management of blunt splenic injuries remain without conclusive answers in the literature. (J Trauma Acute Care Surg. 2012;73: S294–S300. Copyright © 2012 by Lippincott Williams & Wilkins)

KEY WORDS: Guideline; Spleen; Blunt abdominal trauma; surgery.)
Prospective Trial of Angiography and Embolization for All Grade III to V Blunt Splenic Injuries: Nonoperative Management Success Rate Is Significantly Improved

Preston R Miller, MD, FACS, Michael C Chang, MD, FACS, J Jason Hoth, MD, FACS, Nathan T Mowery, MD, FACS, Amy N Hildreth, MD, FACS, R Shayn Martin, MD, FACS, James H Holmes, MD, FACS, J Wayne Meredith, MD, FACS, Jay A Requarth, MD, FACS
INDICATIONS FOR ARTERIOGRAPHY

• Stable patient
• Lesions > 3
• Positive CT findings
• Moderate Hemoperitoneum
• Clinical evidence of ongoing bleeding
ACTIVE CONTRAST EXTRAVASATION
PSEUDO ANEURYSM
• LOCATION
• LEVEL OF OCCLUSION
• VESSEL SIZE
• FLOW VELOCITY
• HEMODYNAMIC CONDITION
• 16 year-old

• MVC

• Liver laceration grade IV
• 14 year-old male

• Hyperbilirubinemia

• Recent transjugular liver bx

• Increased ALT and AST
• 26 year-old male
• MVC
• Pelvic hematoma
• Peri-splenic contrast extravasation
• 45 YO male

• Penetrating lesion to the left upper chest
• 60 year-old male

• Suicide attempt (jumped from the 8\textsuperscript{th} floor)

• Thoracic aorta injury

• Pelvic fractures
CONCLUSION

• VIR PLAYS A KEY ROLE IN TRAUMA

• BE READY FOR MULTIPLE SCENARIOS

• BE FAMILIAR WITH MULTIPLE DEVICES
THANK YOU

MEDICAL UNIVERSITY of SOUTH CAROLINA
Vascular & Interventional Radiology