RECTAL TRAUMA

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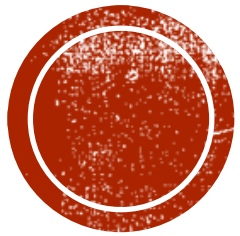


NO DISCLOSURES

RECTAL TRAUMA

- **Objectives**

- Understand the anatomy of the rectum
- Classification of rectal trauma
- Grading system for rectal injuries
- Apply evidence-based management algorithms
- Implement contemporary surgical management strategies
- Evaluate indications for minimally invasive approaches

"Excellence in trauma surgery requires mastery of both traditional principles and contemporary innovations."

Modern Surgical Practice

RECTAL TRAUMA

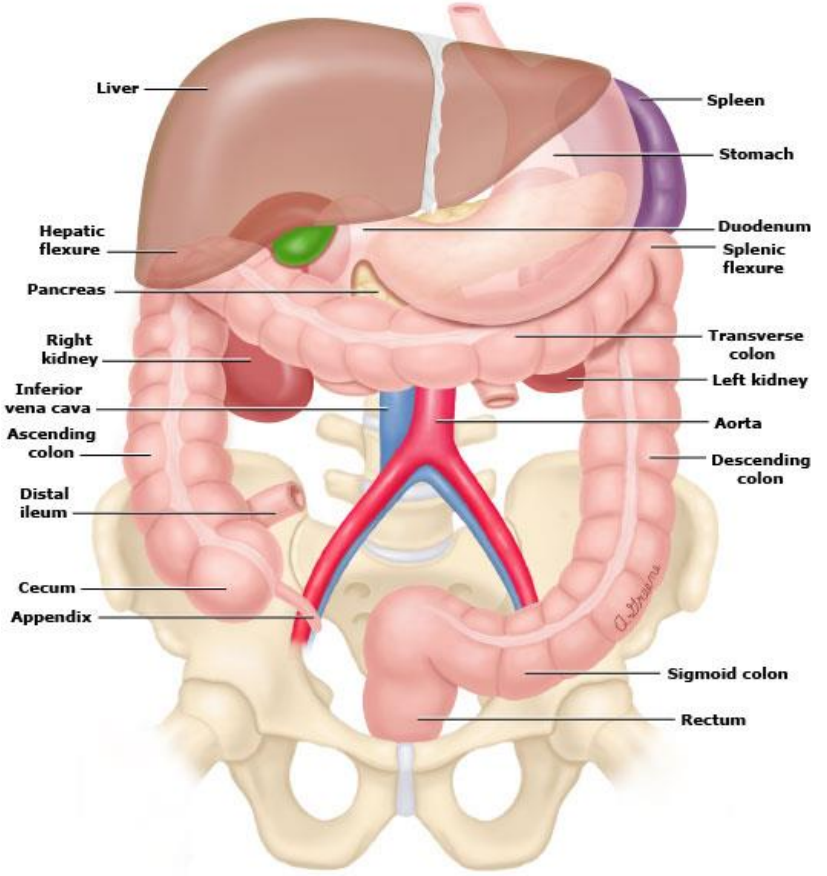
- **Key Anatomical Considerations:**

- The rectum is the distal continuation of the colon, measuring 12 to 15 cm in length.

- The rectum lies anterior to the three inferior sacral vertebrae, the coccyx, and the sacral vessels and is posterior to the bladder in males and the vagina in females.

- The rectum is supplied by the superior, middle rectal, and inferior rectal arteries.
- Venous drainage from the superior rectal and middle rectal veins draining to the IMV and the inferior rectal veins draining to the internal pudendal veins

- • Lymphatic drainage: Upward to inferior mesenteric nodes



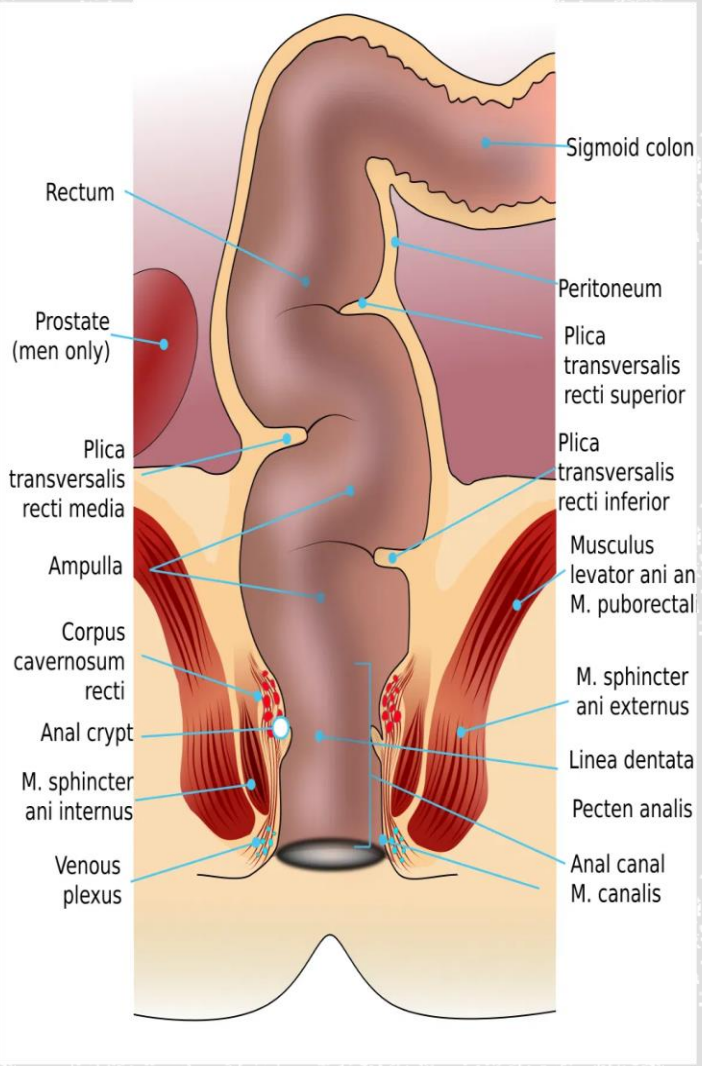
RECTAL TRAUMA

- **Key Anatomical Considerations:**

- Upper 2/3 anteriorly: Intraperitoneal
- Lower 1/3 circumferentially: Extraperitoneal

- • Surgical landmarks critical for operative planning

- Extraperitoneal injuries are more common than intraperitoneal injuries.



Sources: AAST Organ Injury Scale (2018), NIDDK Anatomical Atlas, StatPearls - Rectal Trauma (2024)

RECTAL TRAUMA

- Rectal injuries are relatively uncommon.
- In order of frequency, gastrointestinal injury occurred more commonly in the small bowel (jejunum/ileum), followed by colon/rectum, duodenum, stomach, and appendix.
- Rectal injury can be due to blunt trauma mechanisms (motor vehicle crash, pedestrian injury, falls) or penetrating trauma mechanisms (knife, gunshot, foreign body).
- Most rectal injuries result from penetrating trauma.
- Rectal injuries from blunt trauma are less common and usually occur due to high-energy mechanisms or sharp bony fragments associated with pelvic fractures.

RECTAL TRAUMA

- A high index of suspicion for rectal injury should be maintained, especially in the presence of bullet wounds spanning the pelvis or stab wounds to the perineum or lower buttocks.

- Injuries range from
  - Minor bruising to complete devascularization for blunt injuries
  - Small perforations to destructive injuries for penetrating mechanisms.

RECTAL TRAUMA

The American Association for the Surgery of Trauma (AAST) Organ Injury Scales

AAST Grading System

Rectum Injury Scale of the American Association for the Surgery of Trauma

Grade	Type of Injury	Description of Injury
Ia	Hematoma	Contusion or hematoma without devascularization
Ib	Laceration	Partial thickness laceration
II	Laceration	Laceration < 50% of circumference
III	Laceration	Laceration > 50% of circumference
IV	Laceration	Full-thickness laceration with extension into the perineum
V	Vascular	Devascularized segment

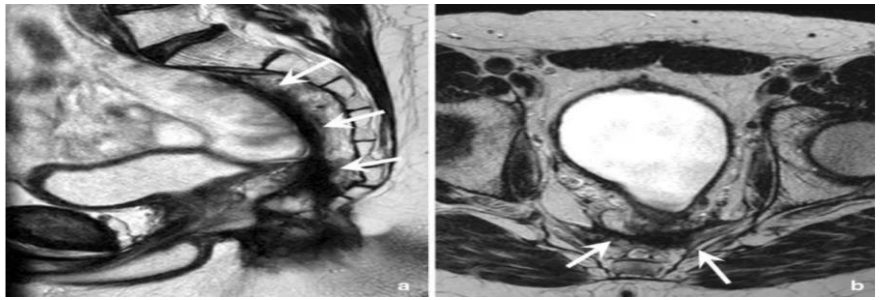
Sources: AAST Organ Injury Scale (2018), NIDDK Anatomical Atlas, StatPearls - Rectal Trauma (2024)

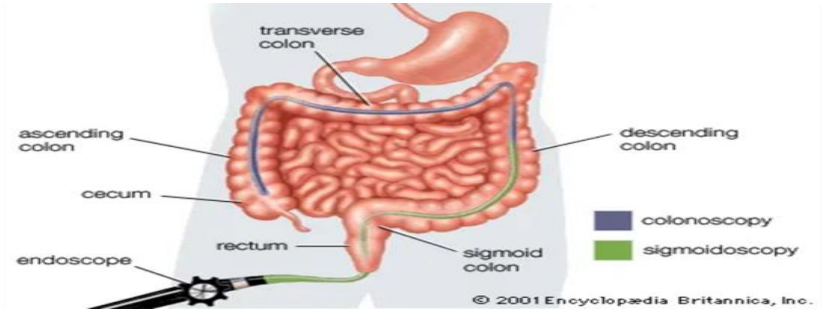
RECTAL TRAUMA ASSESSMENT

- Trauma patients with potential rectal injury should be assessed using Advanced Trauma Life Support principles (ATLS).

DIAGNOSTIC EVALUATION OF RECTAL TRAUMA

- Digital Rectal Exam: Low sensitivity (~51%), risk of enlarging perforation.
- FAST : for unstable patients
- CT with IV Contrast: Gold standard for stable trauma patients
- Proctosigmoidoscopy: Direct visualization of injury
- MRI: Superior soft tissue resolution for detailed assessment
- Intraoperative Examination: Senior-level physician recommended





CT Imaging Metrics:Sensitivity:
92-95% for rectal injuries
• Specificity: 94-98%
Threshold: ≥200mL fluid for detection

Proctosigmoidoscopy Metrics:
Sensitivity: Up to 90% for rectal injury
Best performed by experienced colorectal surgeon
Blood seen on rigid scope highly predictive

Source: Insights into Imaging - SpringerOpen, StatPearls - Rectal Trauma, Radiology Assistant MR Staging

DIAGNOSTIC EVALUATION OF RECTAL TRAUMA

findings on CT scan that suggest a gastrointestinal injury are listed below :

Direct signs of bowel injury:

- Bowel wall discontinuity
- Pneumoperitoneum (free air)
- Oral contrast extravasation
- Extraluminal spillage of bowel contents
- Metallic fragment within bowel wall or lumen

Indirect signs of bowel injury:

- Free fluid
- Bowel wall thickening or intramural hematoma
- Abnormal bowel wall enhancement

Signs of mesenteric injury:

- Mesenteric stranding, hematoma
- Mesenteric vessel abnormalities
- Mesenteric extravasation

The direct signs are specific for gastrointestinal injury, while the indirect signs are sensitive.

MANAGEMENT OF RECTAL TRAUMA

- Evidence-Based Management Pathway

Key Decision Points

- Hemodynamic Status: Stable vs. unstable patients (damage control approach for unstable)
- Anatomical Location: Intraperitoneal vs. extraperitoneal injury management differs
- Injury Severity: Destructive (>50% circumference) vs. non-destructive injuries
- Surgical Approach: Primary repair vs diversion based on individual assessment

- Source: ScienceDirect - Management of Rectal Injuries, PMC Evidence-Based Practices, EAST Guidelines

MANAGEMENT OF RECTAL TRAUMA

Management in Hemodynamically Stable Patients

- CT scan with intravenous contrast.
  - If the CT scan suggests a rectal injury, endoscopy (proctosigmoidoscopy) is performed to confirm the diagnosis and establish the injury's anatomical location.
  - The combination of CT scan and endoscopy has a high sensitivity for diagnosing rectal injuries.

Management in Hemodynamically Unstable Patient

- hemorrhage control takes precedence.
  - These patients are taken directly to the operating room for exploratory laparotomy.
  - If the patient is not in extremis, positioning in lithotomy can facilitate evaluation and management of the rectal injury after bleeding control.
  - The intraperitoneal rectum is assessed via laparotomy, followed by proctoscopy to evaluate the extraperitoneal rectum.

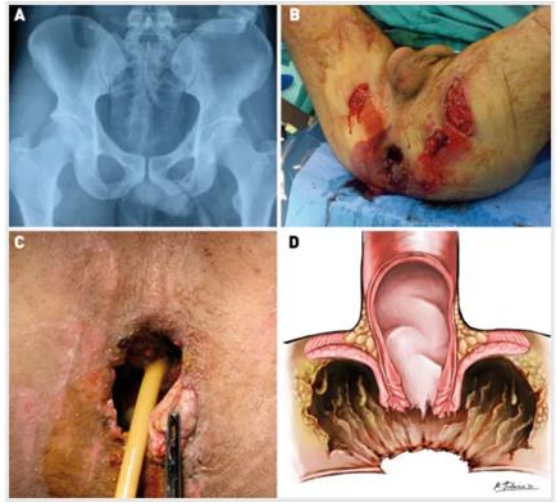
MANAGEMENT OF RECTAL TRAUMA

Traditional Approach

- Routine proximal diversion for all extraperitoneal injuries
- Presacral drainage and distal washout (4 Ds dogma)
- Limited access to distal extraperitoneal injuries
- Higher stoma-related morbidity (35-55%)

Contemporary Approach

- Selective diversion based on injury characteristics
- Primary repair for non-destructive injuries when accessible
- Minimally invasive techniques (TAMIS) for improved access
- Damage control principles for unstable patients



Evidence-Based Decision Making

Primary repair for intraperitoneal and accessible extraperitoneal injuries

Consider diversion for: destructive injuries (>50% circumference), pelvic fractures, hemodynamic instability, high transfusion requirements

Second-look operations for better tissue assessment

Source:Stone & Fabian (1979), PMC Evidence-Based Practices, Cochrane Review (2009)

MANAGEMENT OF RECTAL TRAUMA

2023 Updates

Selective Diversion: Evidence-based criteria replace routine

TAMIS Integration: Minimally invasive options for accessible injuries

Abandoned Practices: Presacral drainage and distal washout no longer recommended

Source: Western Trauma Association Critical Decisions Algorithm (2023), Journal of Trauma and Acute Care Surgery

MANAGEMENT OF RECTAL TRAUMA

❖**Contemporary Rectal Intraperitoneal injury Management**

- Evidence-Based Approach (2024)
- Nondestructive Injuries: (<25% circumference): Primary repair without diversion
- Destructive Injuries :(>50% circumference): Resection and primary anastomosis
- No Routine Diversion: Data supports primary repair without colostomy

❖ Selective Diversion Criteria

Severe Shock: Ongoing hemodynamic instability
Contamination: Significant intra-abdominal soilage
Multiple Anastomoses: Complex reconstruction requirements
Vascular Compromise: Questionable tissue viability

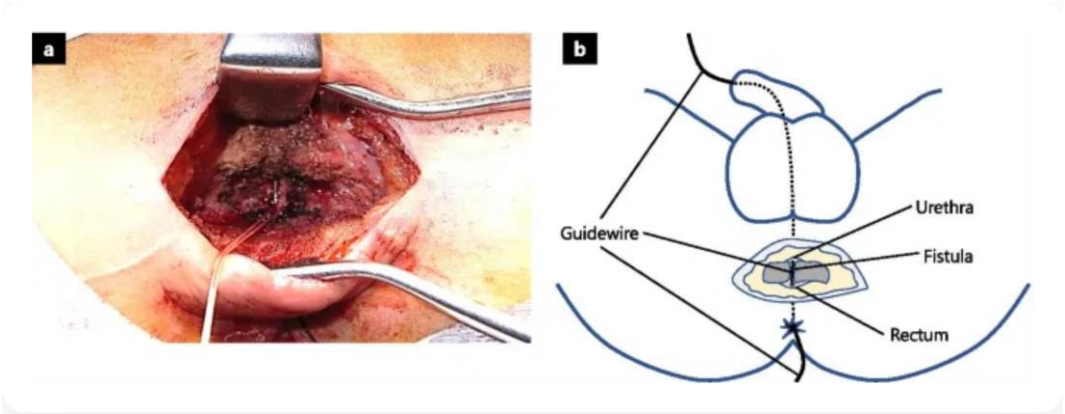
Source: PMC Traumatic Rectal Injury Management (2024), Cleveland Clinic Surgical Techniques, AAST Multi-institutional Study

MANAGEMENT OF RECTAL TRAUMA

❖ Rectal Extraperitoneal injury Management

Contemporary Gold Standard

- Fecal Diversion:Mandatory for high-energy mechanisms (blunt trauma, GSW)
- Laparoscopic Colostomy: Well-tolerated when other injuries don't mandate laparotomy
- Early Closure: Carefully selected patients can have closure during index admission



Primary Repair Candidates

- Simple Lacerations : Small, accessible injuries close to anus
- Low-Velocity Penetrating :Stab wounds with minimal tissue damage
- Transanal Approach: Lower morbidity and length of stay when feasible
- TAMIS Integration: Minimally invasive option for accessible injuries

Source: PMC Traumatic Rectal Injury (2024), SpringerOpen Surgical Case Reports, EAST Conditional Recommendations

TAMIS APPROACH (TRANSANAL MINIMALLY INVASIVE SURGERY)

Technical Advantages

- Enhanced Visualization:Magnified view of injury site
- Precise Repair : Improved suturing accuracy
- Reduced Morbidity: Avoids external incisions

Technical Considerations

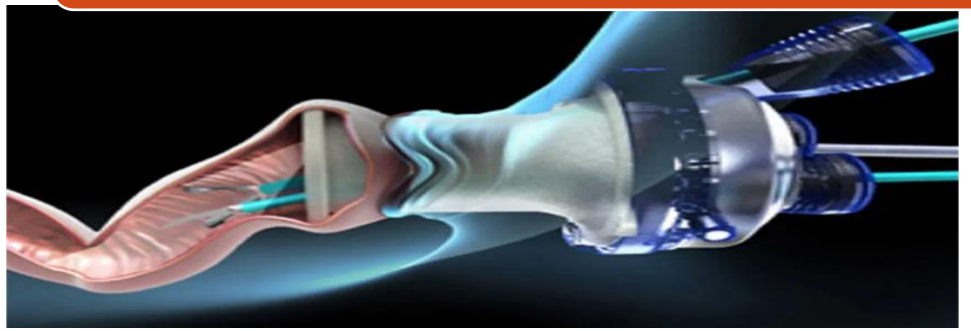
- Technical Setup: GelPOINT Path or SILS port for trans-anal access, CO_2 insufflation for pneumorectum.
- Surgical Technique: Standard laparoscopic instruments endoluminal suturing for primary closure

Patient Selection

Ideal Candidates: Low-velocity penetrating extraperitoneal rectal trauma, hemodynamically stable patients

Contraindications: Destructive injuries (>25% circumference), unstable patients, high-volume transfusion requirements

Evidence:Case series show successful primary repair without diversion or complications in selected patients



Source: Trauma Surgery & Acute Care - BMJ (2020), Spandidos Publications, Dr. Markides Surgical Techniques

Diagnosis and management of traumatic rectal injury: A Western Trauma Association critical decisions algorithm"

- The evidence against the routine use of presacral drainage in managing extraperitoneal rectal injuries has evolved significantly over time.
- Initially, presacral drainage was considered essential based on military data from the World Wars and the Vietnam War, which showed a reduction in mortality and infectious complications when combined with fecal diversion and distal rectal washout.

- Several contemporary studies have questioned the utility of presacral drainage.

- A randomized controlled trial (RCT) published in 1998 involving 48 patients with penetrating extraperitoneal rectal injuries found no impact on infectious complications from presacral drainage and recommended abandoning the technique.

- Additionally, an Eastern Association for the Surgery of Trauma practice management guideline on non-destructive penetrating extraperitoneal injuries recommended against the routine use of presacral drainage.

- Further evidence from an American Association for the Surgery of Trauma (AAST)-sponsored multicenter trial revealed that presacral drainage, with or without distal rectal washout, was independently associated with an increase in infectious complications. This led to recommendations to abandon these techniques in clinical practice.

MANAGEMENT OF RECTAL TRAUMA

- A systematic review identified eight trials (two emergency surgeries) that compared drainage following colorectal resections (primary anastomosis) with no drainage.
- No significant differences were found in the incidence of complications .
- Thus, not to use drains following the repair or resection of the colon or intraperitoneal rectum when managing traumatic injury.

102 PubMed

TI Evidence-based value of prophylactic drainage in gastrointestinal surgery: a systematic review and meta-analyses.

AU Petrowsky H, Demartines N, Rousson V, Clavien PA

SO Ann Surg. 2004;240(6):1074.

OBJECTIVE: To determine the evidence-based value of prophylactic drainage in gastrointestinal (GI) surgery.

METHODS: An electronic search of the Medline database from 1966 to 2004 was performed to identify articles comparing prophylactic drainage with no drainage in GI surgery. The studies were reviewed and classified according to their quality of evidence using the grading system proposed by the Oxford Centre for Evidence-based Medicine. Seventeen randomized controlled trials (RCTs) were found for hepato-pancreatico-biliary surgery, none for upper GI tract, and 13 for lower GI tract surgery. If sufficient RCTs were identified, we performed a meta-analysis to characterize the drain effect using the random-effects model.

RESULTS: There is evidence of level 1a that drains do not reduce complications after hepatic, colonic, or rectal resection with primary anastomosis and appendectomy for any stage of appendicitis. Drains were even harmful after hepatic resection in chronic liver disease and appendectomy. In the absence of RCTs, there is a consensus (evidence level 5) about the necessity of prophylactic drainage after esophageal resection and total gastrectomy due to the potential fatal outcome in case of anastomotic and gastric leakage.

CONCLUSION: Many GI operations can be performed safely without prophylactic drainage. Drains should be omitted after hepatic, colonic, or rectal resection with primary anastomosis and appendectomy for any stage of appendicitis (recommendation grade A), whereas prophylactic drainage remains indicated after esophageal resection and total gastrectomy (recommendation grade D). For many other GI procedures, especially involving the upper GI tract, there is a further demand for well-designed RCTs to clarify the value of prophylactic drainage.

AD Department of Visceral and Transplant Surgery, University Hospital, Raemistrasse 100, CH-8091 Zürich, Switzerland.

Diagnosis and management of traumatic rectal injury: A Western Trauma Association critical decisions algorithm"

- Despite these findings, there may still be a small and highly select group of patients who could benefit from presacral drainage.

- These patients might include those who are likely to be intolerant of sepsis, such as the elderly or those with comorbidities, or patients with certain injury morphologies, such as large rectal wall defects implying a greater degree of fecal spillage into the presacral space.

Medline ® Abstracts for References 95,97,102-107 of 'Traumatic gastrointestinal injury in the adult patient'

95 PubMed

TI Civilian extraperitoneal rectal gunshot wounds: surgical management made simpler.

AU Navsaria PH, Edu S, Nicol AJ

SO World J Surg. 2007;31(6):1345.

BACKGROUND: Rectal injuries are associated with significant morbidity and mortality. Controversy persists regarding routine presacral drainage, distal rectal washout (DRW), and primary repair of extraperitoneal rectal injuries. This retrospective review was performed to determine the outcome of rectal injuries in an urban trauma center with a high incidence of penetrating trauma where a non-aggressive surgical approach to these injuries is practiced.

97 PubMed

TI The role of presacral drainage in the management of penetrating rectal injuries.

AU Gonzalez RP, Falimirski ME, Holevar MR

SO J Trauma. 1998;45(4):656.

PURPOSE: To compare in a randomized, prospective manner infectious complication rates associated with presacral drainage versus no drainage in the presence of penetrating rectal injury.

PubMed

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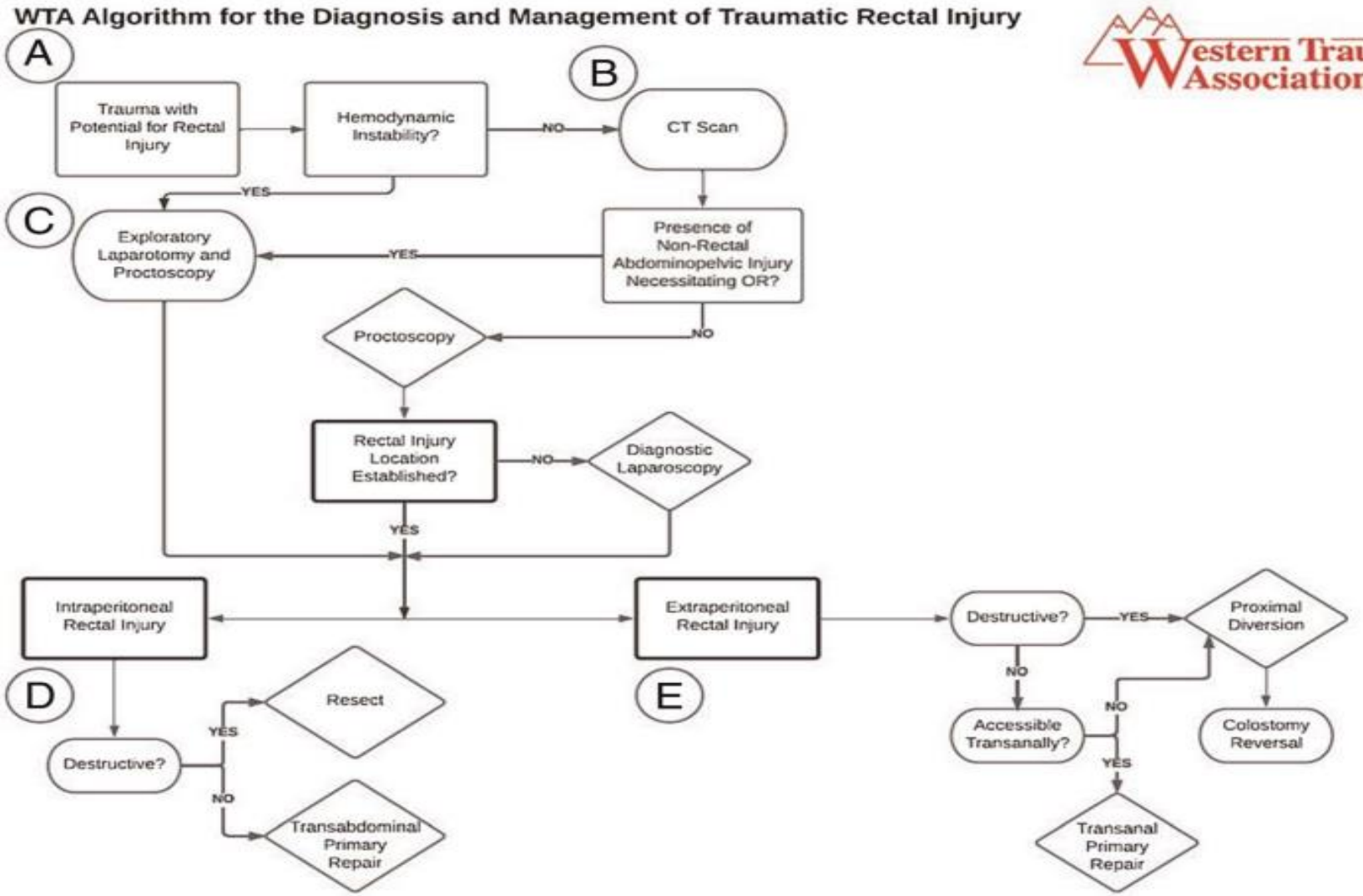

Figure 1. WTA algorithm for the diagnosis and management of traumatic rectal injury. Circled letters correspond to lettered sections in the article text. OR, operating room.

RECTAL INJURY- SUMMARY

- High index of suspicion for rectal injury
- individualized management based on patient factors, clinical judgment, and available resources.
- Evidence-Based Management: Shift from routine diversion to selective approach based on injury characteristics, hemodynamic status, and anatomical location
- TAMIS Technique: Consider for accessible extraperitoneal injuries in stable patients, potentially avoiding diversion and improving functional outcomes
- Multidisciplinary Care: Collaborate with trauma surgeons, radiologists, and critical care specialists for optimal outcomes in complex cases
- Quality of Life Focus: Consider long-term functional outcomes and sphincter preservation when planning surgical approach

RECTAL INJURY- SUMMARY

Continuing Education Resources

- ASCRS Guidelines: American Society of Colon and Rectal Surgeons
  Annual updates on colorectal trauma

- EAST Guidelines:Eastern Association for the Surgery of Trauma
  Evidence-based trauma management

- WTA Algorithms: Western Trauma Association
  Critical Decisions in Trauma

Thank you..