

Rectal Injury

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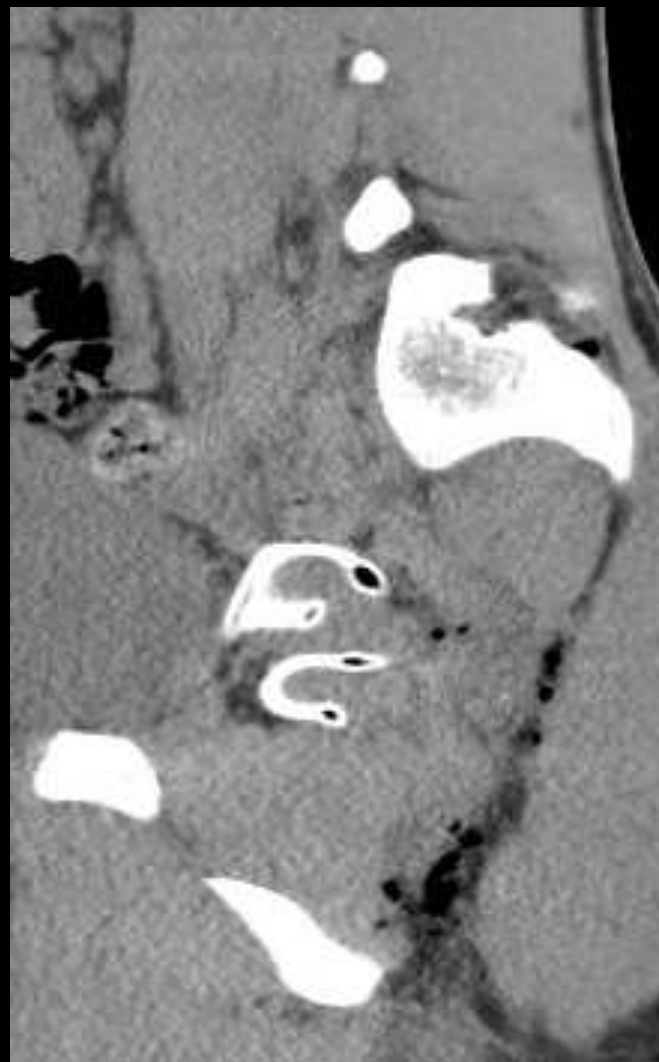
23yrs, farmer
- Fell off tractor



23yrs, farmer
- Fell off tractor



23yrs, farmer
- Fell off tractor





a) Divert (Stoma)

b) Not divert





a) Drain

b) No drain

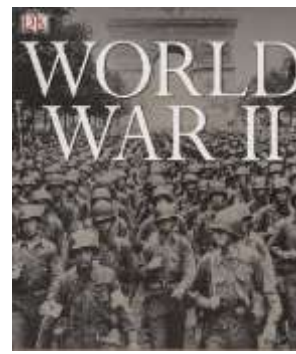




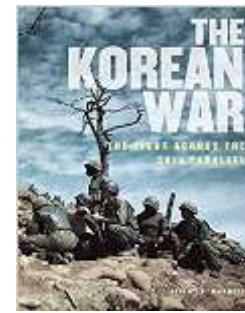
Civil war
(1861-1865)



WWI
(1914-1918)



WWII
(1939-1945)



Korean
(1950-1953)



Vietnam
(1954-1975)

Non-surgical



Primary
repair



Fecal
diversion
+
Damage control



Presacral
drainage
(intervent.
Radiology)



4 D's
Debridement
Diversion
Drainage
Distal washout

Mortality

90%

60%

<35%

<10%

Sir William Ogilvie

Lavendson, Cohen

4 D's

Debridement

Diversion

Drainage

Distal washout



- Military trauma = high-velocity mechanism
- Iraq/Afghanistan: 13% anastomotic failure rates (ostomy)
- Mortality w/o diversion 10.8% vs. 3.7%. (n=251, retrospective)
- Extraperitoneal injury: **full adherence 4D's 7%**
 - 100% diversion, distal washout 26%, presacral drainage 21%

Rectal trauma injuries: outcomes from the U.S. National Trauma Data Bank

Isolated Rectal Injury

K. J. Gash^{1,2} · K. Suradkar^{1,2} · R. P. Kiran^{1,2}

- 1472/1.7M (**0.1%**), 81% male, median 30 yrs
- **60% penetrating** vs. 40% blunt
- 53% isolated **EXTRA-** vs. 47% isolated **INTRA-**peritoneal
- **49% fecal diversion**

Rectal trauma injuries: outcomes from the U.S. National Trauma Data Bank

mechanism

K. J. Gash^{1,2} · K. Suradkar^{1,2} · R. P. Kiran^{1,2}

	Blunt (<i>n</i> = 587, 40%)	Penetrating (<i>n</i> = 879, 60%)	<i>p</i> value
Mean age (years)	41.3 (17.8)	31.8 (12.5)	<0.001
Male gender	438 (74.6%)	746 (84.9%)	<0.001
Systolic blood pressure (mmHg)	111 (29.6)	118 (35.0)	0.889
Respiratory rate (beats per minute)	18.9 (7.7)	20.8 (7.5)	0.846
Heart rate (beats per minute)	109 (25.1)	101 (26.7)	0.002
Injury severity score	30.4 (14.9)	19.3 (10.2)	<0.001
Isolated intraperitoneal or combined intra and extra-peritoneal injuries	100 (17.0%)	594 (67.6%)	<0.001

Rectal trauma injuries: outcomes from the U.S. National Trauma Data Bank

mechanism

K. J. Gash^{1,2} · K. Suradkar^{1,2} · R. P. Kiran^{1,2}

	Blunt (<i>n</i> = 587, 40%)	Penetrating (<i>n</i> = 879, 60%)	<i>p</i> value
Stoma	34%	60% (<0.001)	
Outcomes	23% stoma alone 11% resection/repair + stoma 1% resection, no stoma 9% suture repair 57% conservative	40% stoma alone 19% resection/repair + stoma 2% resection, no stoma 8% suture repair 31% conservative	

Rectal trauma injuries: outcomes from the U.S. National Trauma Data Bank

mechanism

K. J. Gash^{1,2} · K. Suradkar^{1,2} · R. P. Kiran^{1,2}

	Blunt (<i>n</i> = 587, 40%)	Penetrating (<i>n</i> = 879, 60%)	<i>p</i> value
Return to the operating room	19 (3.2%)	27 (3.1%)	0.893
Length of stay (days)	31.8 (31.6)	21.4 (22.2)	<0.001
ICU length of stay (days)	15.8 (16.8)	8.9 (10.4)	<0.001
Ventilator (days)	9.9 (11.7)	5.7 (7.6)	0.005
Overall in-hospital mortality, excluding deaths in ED	62 (10.6%)	53 (6.0%)	<0.001

Rectal trauma injuries: outcomes from the U.S. National Trauma Data Bank

location

K. J. Gash^{1,2} · K. Suradkar^{1,2} · R. P. Kiran^{1,2}

	Isolated extraperitoneal (<i>n</i> = 778, 52.8%)	Isolated intraperitoneal and combined intra- and extraperitoneal (<i>n</i> = 694, 47.2%)	<i>p</i> value
Mean age (years)	38.5 (17.3)	31.4 (12.7)	<0.001
Male gender	604 (77.6%)	585 (84.3%)	
Systolic blood pressure (mmHg)	121.4 (27.3)	122.7 (33.3)	0.130
Respiratory rate (bpm)	18.7 (6.0)	19.7 (6.4)	0.018
Heart rate (bpm)	97.1 (26.8)	96.6 (23.8)	0.117
Injury severity score	17.9 (14.0)	16.6 (10.1)	<0.001
Stoma (Y)	284 (36.5%)	442 (63.7%)	<0.001
Penetrating trauma	285 (36.6%)	594 (85.6%)	<0.001

Rectal trauma injuries: outcomes from the U.S. National Trauma Data Bank

location

K. J. Gash^{1,2} · K. Suradkar^{1,2} · R. P. Kiran^{1,2}

Isolated extraperitoneal
(*n* = 778, 52.8%)

Isolated intraperitoneal and combined intra-
and extraperitoneal (*n* = 694, 47.2%)

p value

26% stoma alone
11% resection/repair + stoma
9% resection, no stoma
8% suture repair
46% no surgery

Stoma 37%

42% stoma alone
22% resection/repair + stoma
10% resection, no stoma
27% conservative

64% (<0.001)

Rectal trauma injuries: outcomes from the U.S. National Trauma Data Bank

location

K. J. Gash^{1,2} · K. Suradkar^{1,2} · R. P. Kiran^{1,2}

	Isolated extraperitoneal (<i>n</i> = 778, 52.8%)	Isolated intraperitoneal and combined intra- and extraperitoneal (<i>n</i> = 694, 47.2%)	<i>p</i> value
Return to the operating room	24 (3.1%)	22 (3.2%)	0.925
Length of stay (days)	28.4 (27.0)	23.7 (26.9)	0.001
ICU length of stay (days)	13.8 (14.9)	10.2 (12.6)	<0.001
Ventilator (days)	9.1 (11.1)	6.2 (8.1)	0.056
Overall in-hospital mortality, excluding deaths in ED	64 (8.2%)	51 (7.4%)	0.531

Rectal trauma injuries: outcomes from the U.S. National Trauma Data Bank

stoma

K. J. Gash^{1,2} · K. Suradkar^{1,2} · R. P. Kiran^{1,2}

	Stoma* 726 (49.3%)	No stoma 746 (50.7%)	<i>p</i> value
Mean age (years)	32.9 (13.7)	37.3 (17.2)	<0.001
Male gender	616 (84.8%)	573 (76.8%)	<0.001
Systolic blood pressure (mmHg)	123.1 (29.1)	121.0 (28.0)	0.084
Respiratory rate (bpm)	19.8 (6.0)	18.6 (6.5)	0.357
Heart rate (bpm)	98.5 (22.6)	94.5 (28.1)	0.016
Injury severity score	17.9 (11.6)	16.2 (13.3)	<0.001
Penetrating	522 (72.0%)	356 (47.7%)	<0.001
Isolated extraperitoneal	284 (39.1%)	494 (66.2%)	<0.001
Isolated intraperitoneal or combined intra- and extraperitoneal	442 (60.9%)	252 (33.8%)	<0.001
Return to the operating room	29 (4.0%)	17 (2.3%)	0.059
Length of stay (days)	28.6 (27.5)	22.6 (28.5)	<0.001
ICU length of stay (days)	13.6 (15.6)	10.1 (11.0)	0.004
Ventilator (days)	8.4 (10.6)	6.7 (8.8)	0.540
Overall in-hospital mortality, excluding deaths in ED	29 (4.0%)	64 (8.6%)	<0.001

Rectal trauma injuries: outcomes from the U.S. National Trauma Data Bank

MORTALITY

K. J. Gash^{1,2} · K. Suradkar^{1,2} · R. P. Kiran^{1,2}

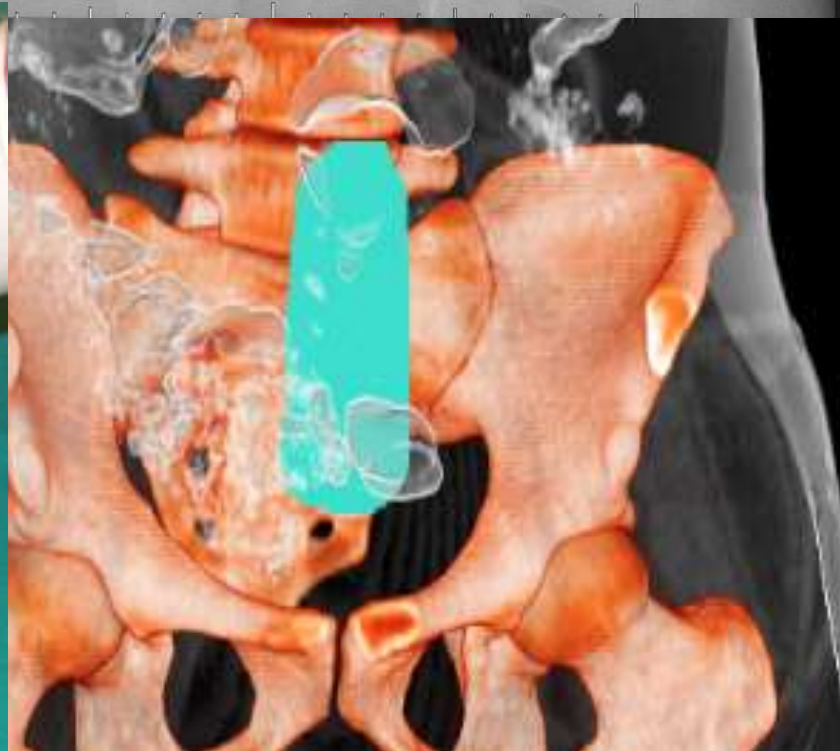
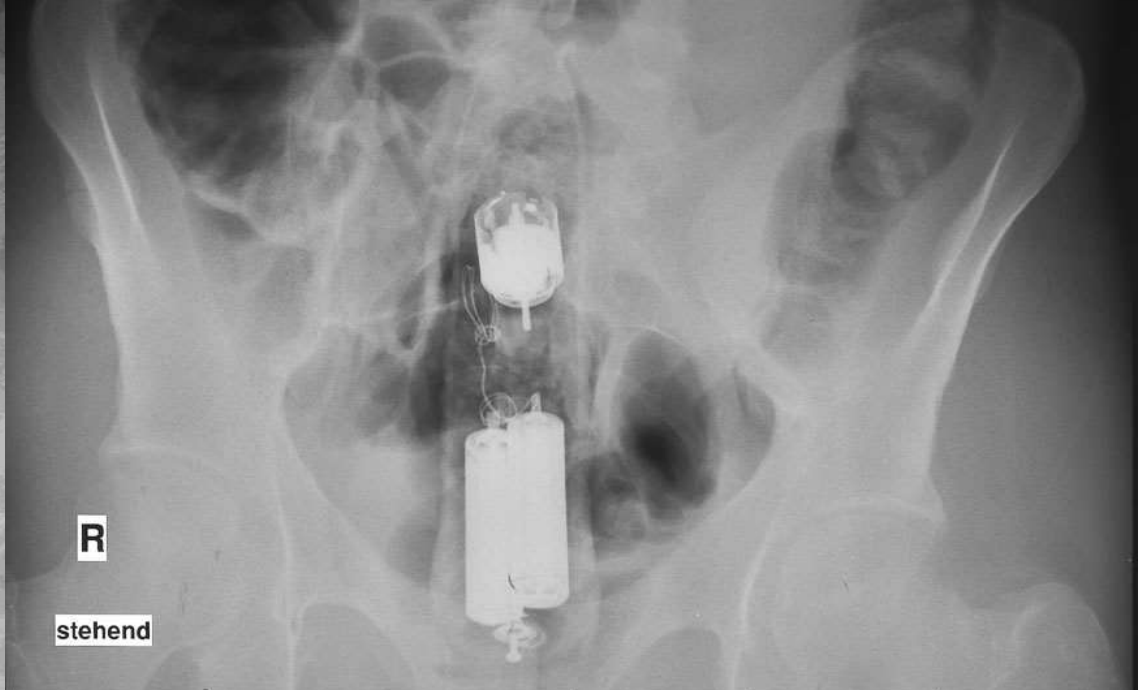
Mortality	<i>p</i> value	Hazards ratio (HR)	95% confidence interval for HR	
			Lower bound	Upper bound
Injury severity score	<0.0001	1.073	1.046	1.101
Age	<0.0001	1.044	1.019	1.069
Colostomy only	Reference			
Resection/suture + ostomy	0.542	1.304	0.555	3.065
Resection/suture without ostomy	0.007	3.322	1.389	7.941
No return to the operating room	Reference			
Return to the operating room	0.054	3.063	0.983	9.542
Isolated intraperitoneal or combined intra- and extraperitoneal	Reference			
Isolated extraperitoneal	0.348	0.659	0.275	1.575
Males	Reference			
Females	0.778	0.863	0.309	2.407
Admission to the ICU	Reference			
No admission to the ICU	0.034	3.511	1.099	11.214
No urological trauma	Reference			
Urological trauma	0.734	0.875	0.406	1.887
Penetrating	Reference			
Blunt	0.635	0.791	0.301	2.077

The management of penetrating rectal and anal trauma: A systematic review

Daniel P. Ahern*, Michael E. Kelly, Danielle Courtney, Emanuele Rausa, Des C. Winter

Department of Colorectal Disease, St. Vincent's University Hospital, Ireland

- 86% male, 30.5 yrs
- 47% gunshot, 25% explosive/blast injury/combat
- 0.5% stab wounds, 2.5% foreign bodies



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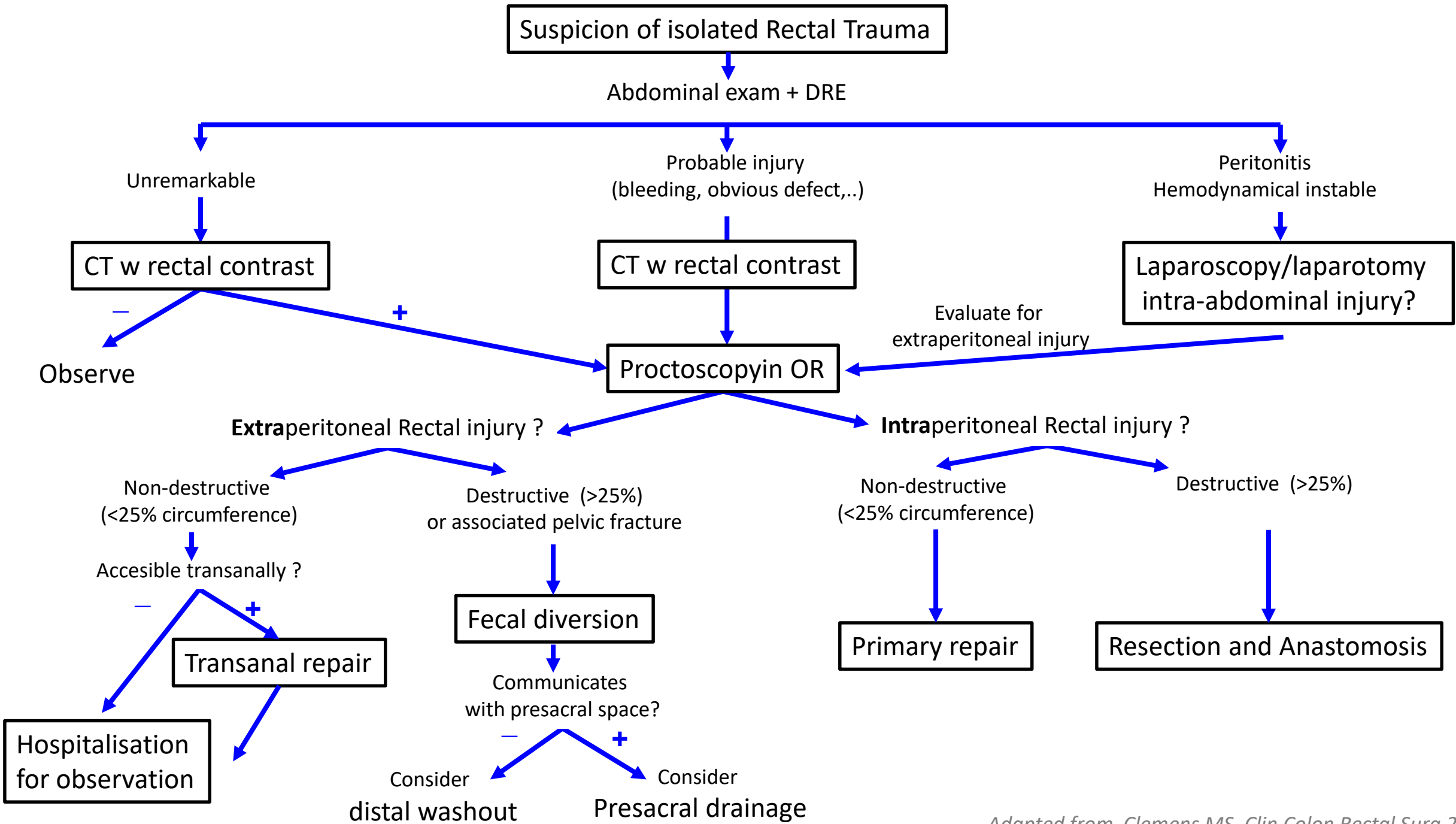
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- **Civilian based** (n=156 patients)
 - 39% genito-urinary lesions
 - 32% small bowel injury
 - 10% pelvic fracture

CT



Suspicion of isolated Rectal Trauma

Abdominal exam + DRE

Unremarkable

Probable injury
(bleeding, obvious defect,..)

Peritonitis
Hemodynamical instable

Suspicion of isolated Rectal Trauma

Abdominal exam + DRE

Unremarkable

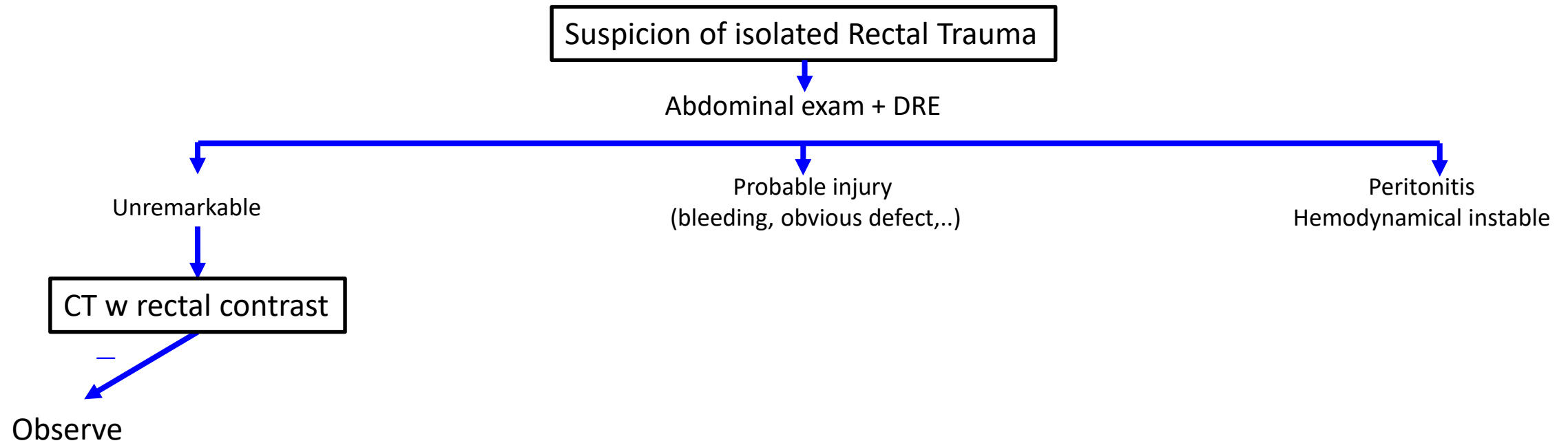
Probable injury
(bleeding, obvious defect,..)

Peritonitis
Hemodynamical instable

Digital Rectal exam

- Blood?
- Rectum wall lesion?
- Foreign body (clothes)?
- Protrusion of a piece of bone?

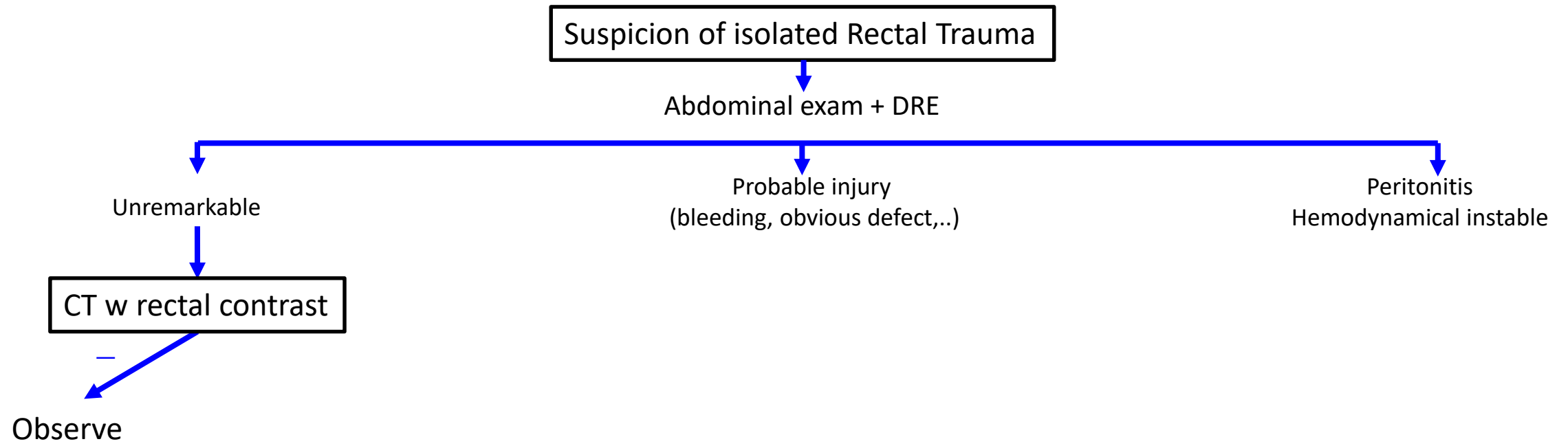


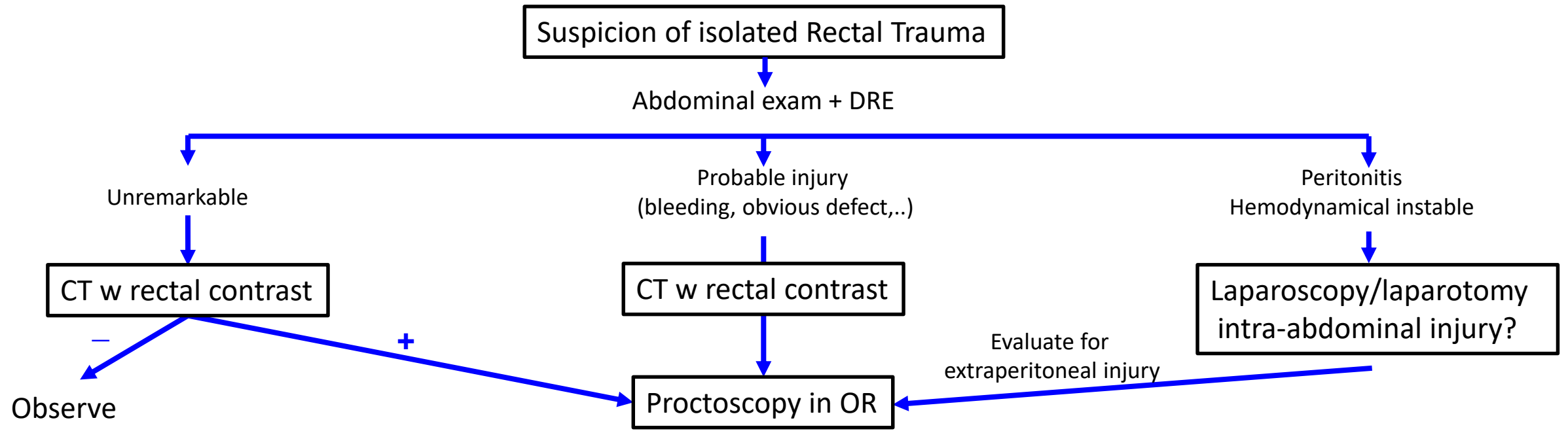


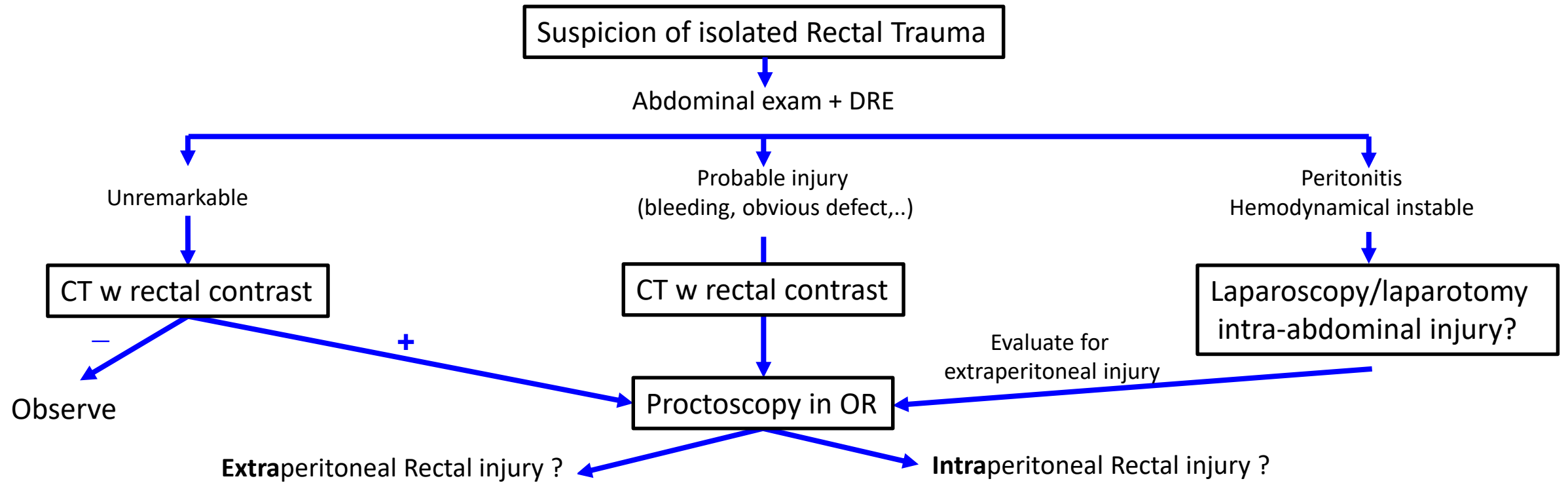
100% sensitivity

96% specificity

100% negative predictive value





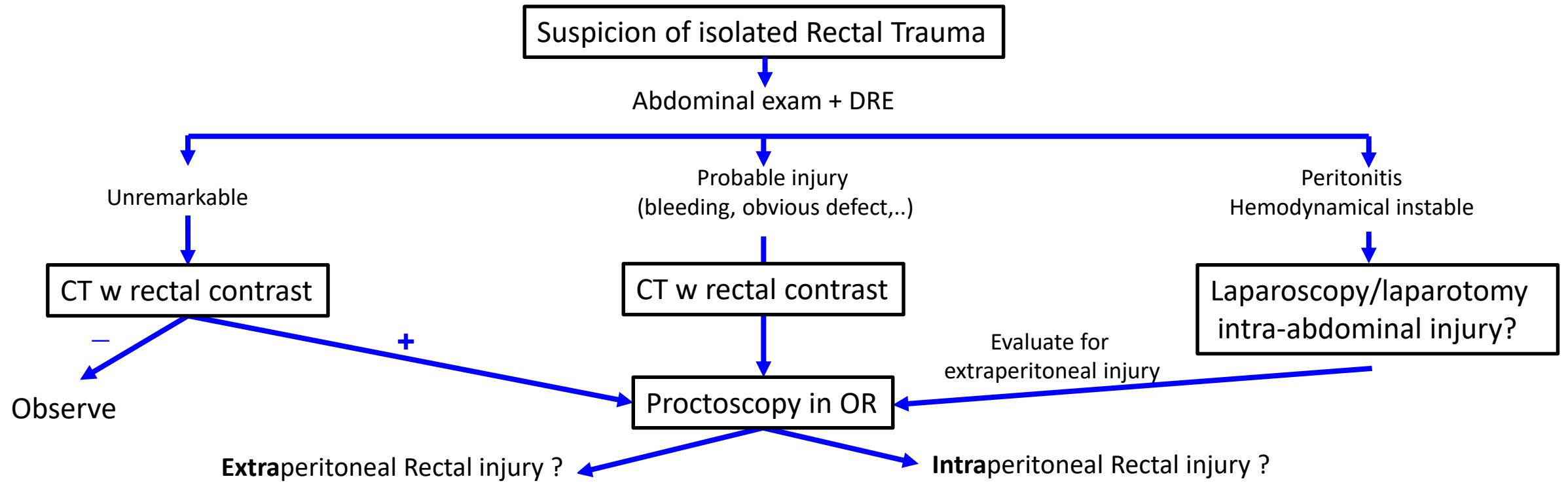


85% sensitivity
for extraperitoneal lesions



Rectosigmoidoscopy

- Presence of blood or hematoma?
- Mucosal lesion or complete rupture?
- Fistula?



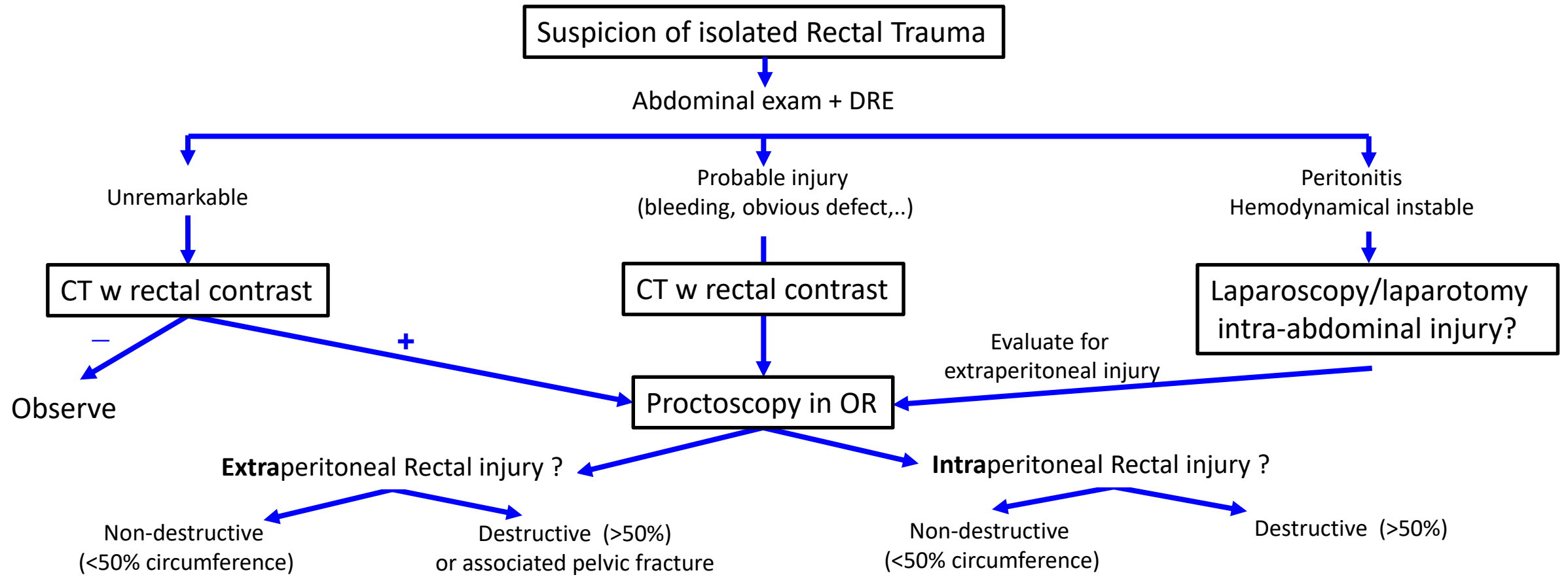
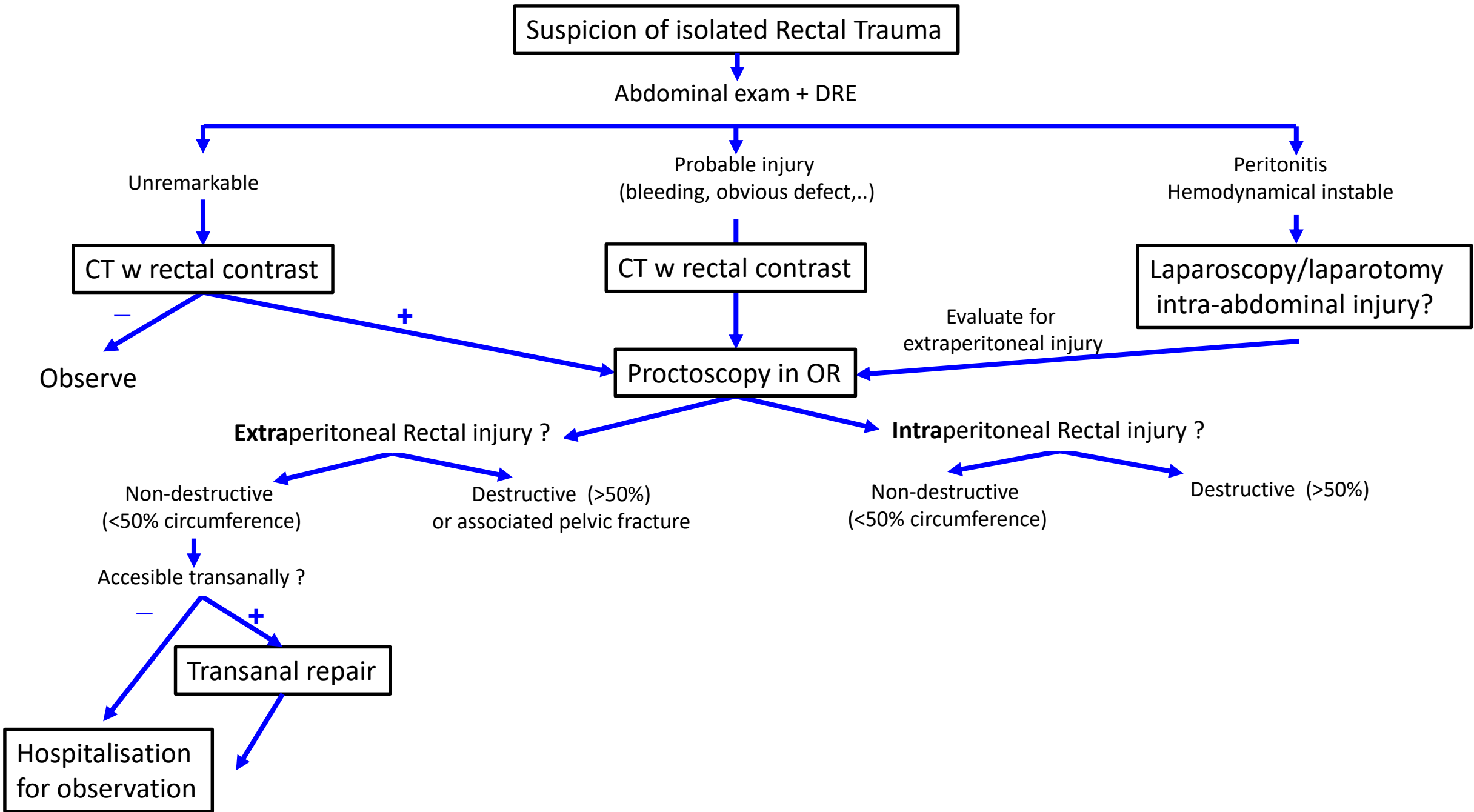
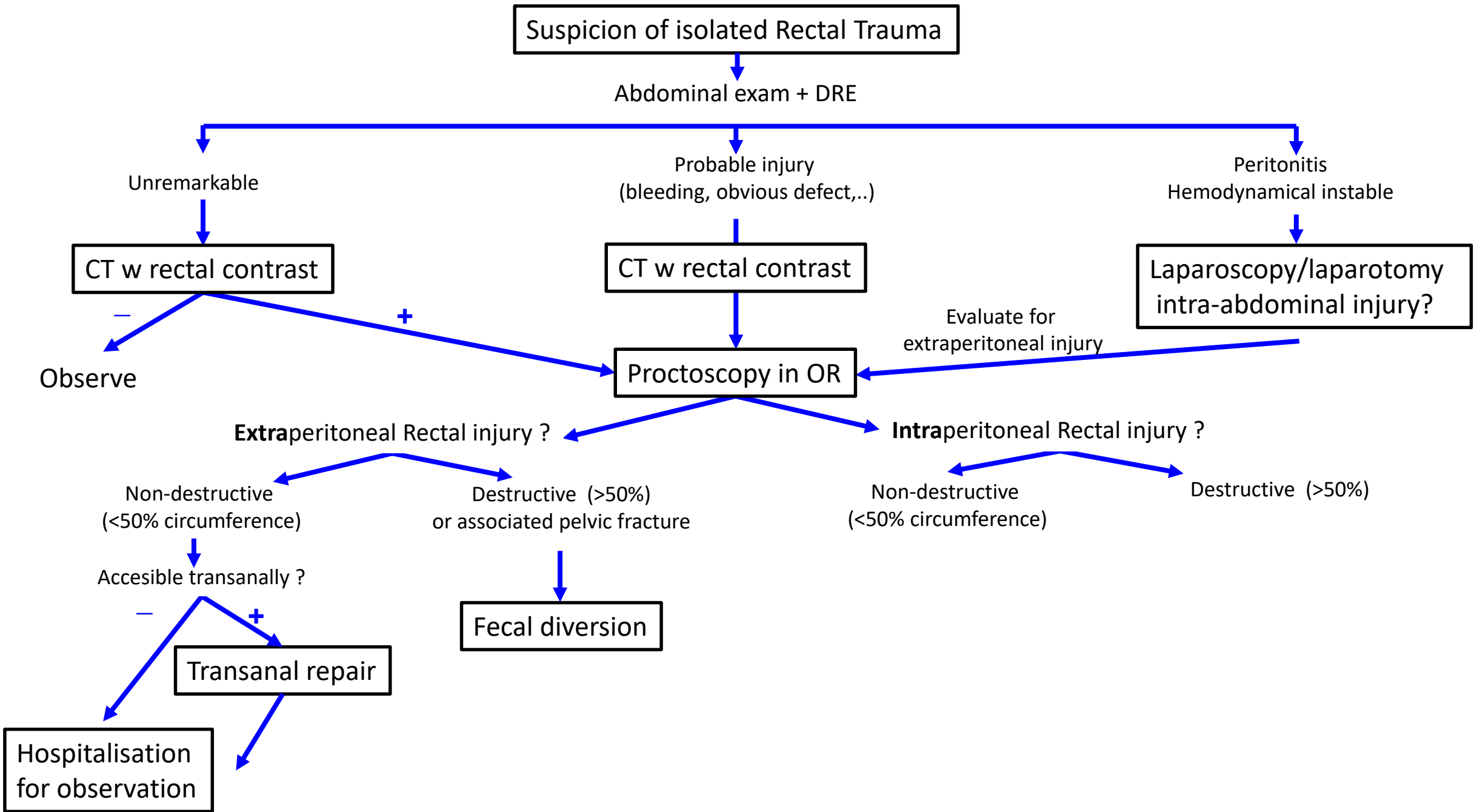


Table 1 – AAST rectal injury classification.

Grade of injury	Description of injury
I	Contusion or hematoma without devascularization or partial-thickness injury of the rectum
II	Full-thickness laceration involving <50% of the circumference of the rectum
III	Full-thickness laceration involving >50% of the circumference of the rectum
IV	Full-thickness laceration that extends into perineum
V	Devascularized segment of rectum





Suspicion of isolated Rectal Trauma

Abdominal exam + DRE

Unremarkable

Probable injury
(bleeding, obvious defect,..)

Peritonitis
Hemodynamical instable

CT w rectal contrast

CT w rectal contrast

Laparoscopy/laparotomy
intra-abdominal injury?

Observe

Proctoscopy in OR

Evaluate for
extraperitoneal injury

Extraperitoneal Rectal injury ?

Intraperitoneal Rectal injury ?

Non-destructive
(<50% circumference)

Destructive (>50%)
or associated pelvic fracture

Non-destructive
(<50% circumference)

Destructive (>50%)

Accesible transanally ?

Fecal diversion

Communicates
with presacral space?

Consider
distal washout

Consider
Presacral drainage

Transanal repair

Hospitalisation
for observation

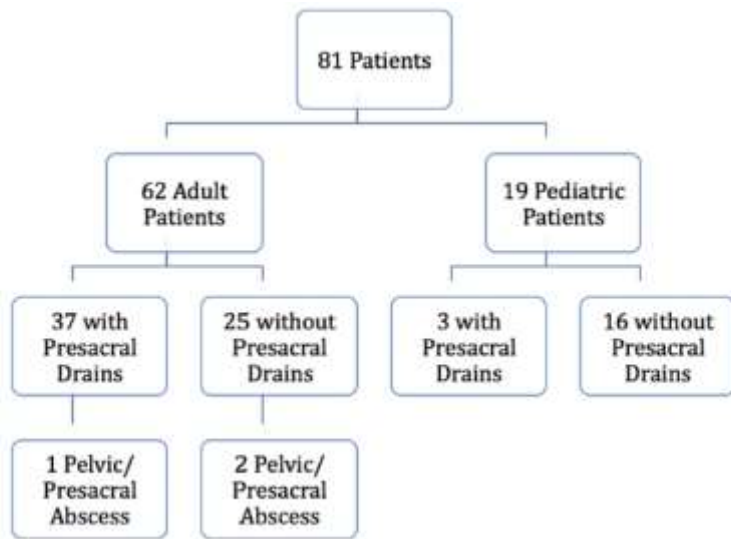


The utility of presacral drainage in penetrating rectal injuries in adult and pediatric patients

Kate B. Savoie, MD, MS,^a Thomas M. Beazley, BS,^a Brent Cleveland, BA,^b Sina Khaneki, MD,^b Troy A. Markel, MD,^b Peter M. Hammer, MD,^b Stephanie Savage, MD, MS,^b and Regan F. Williams, MD, MS^{a,*}

^aDepartment of Surgery, University of Tennessee Health Science Center, Memphis, Tennessee

^bDepartment of Surgery, Indiana School of Medicine, Indianapolis, Indiana



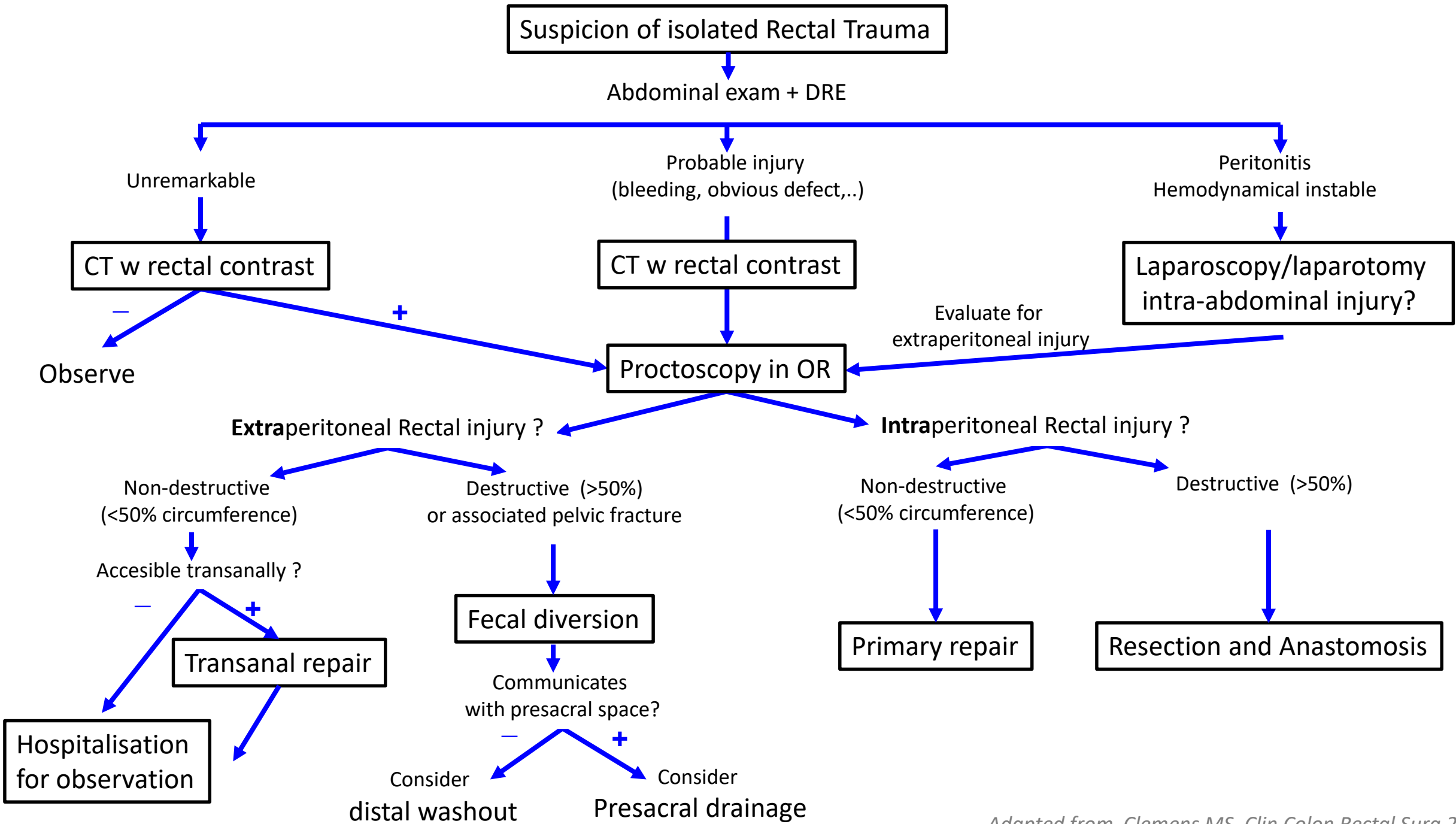
84% gunshot

59% impalement

Table 3 – Stratified analysis, adult cohort.

Variables	Drain (n = 37)	No drain (n = 25)	P value
Proctoscopy, n (%)			
Done	34 (92)	12 (48)	0.0001
Positive	31 (100)	10 (83)	0.02
Rectal washout, n (%)	9 (47)	4 (21)	0.09
Missile tract drainage, n (%)	1 (7)	0 (0)	0.25
Proximal diversion, n (%)	35 (95)	12 (50)	<0.0001
Adverse events, n (%)			
Any adverse event	5 (16)	6 (24)	0.43
Wound infection	2 (5)	0 (0)	0.24
Intraabdominal abscess	0 (0)	1 (4)	0.22
Bacteremia	0 (0)	0 (0)	NA
Presacral/pelvic abscess	1 (3)	2 (8)	0.34
Drain site infection	0 (0)	0 (0)	NA
Wound tract infection	0 (0)	0 (0)	NA
Necrotizing	0 (0)	0 (0)	NA
Urinary tract infection	0 (0)	0 (0)	NA
Pneumonia	0 (0)	0 (0)	NA
Mortality	0 (0)	2 (8)	0.08

→ No difference in any infectious complications



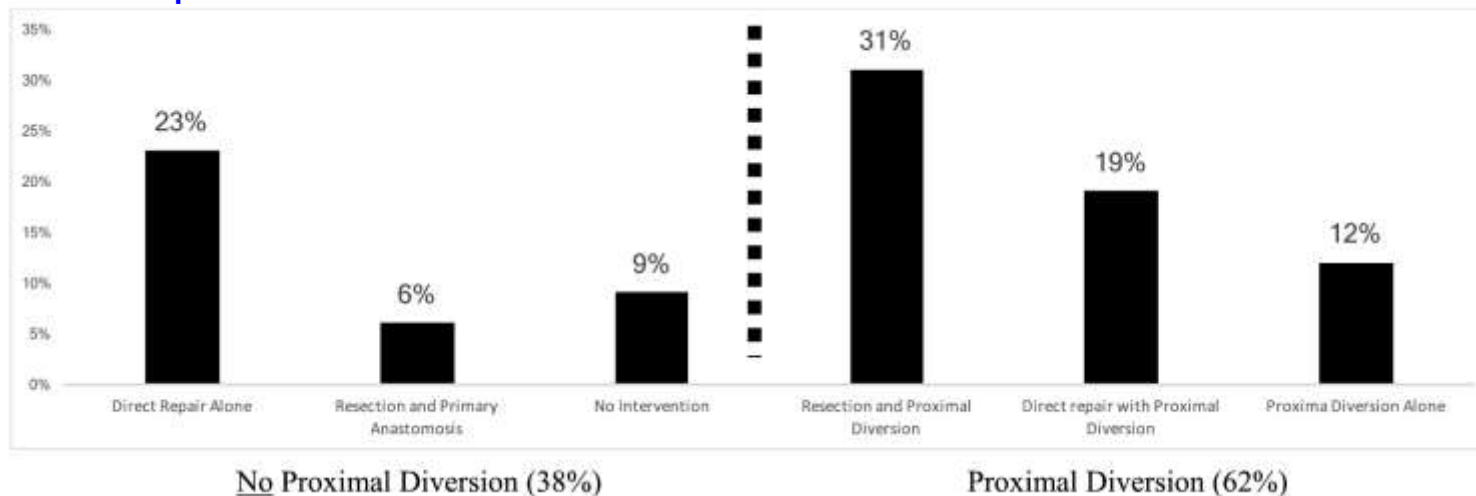
Contemporary management of rectal injuries at Level I trauma centers: The results of an American Association for the Surgery of Trauma multi-institutional study

32% intraperitoneal
58% extraperitoneal
10% both

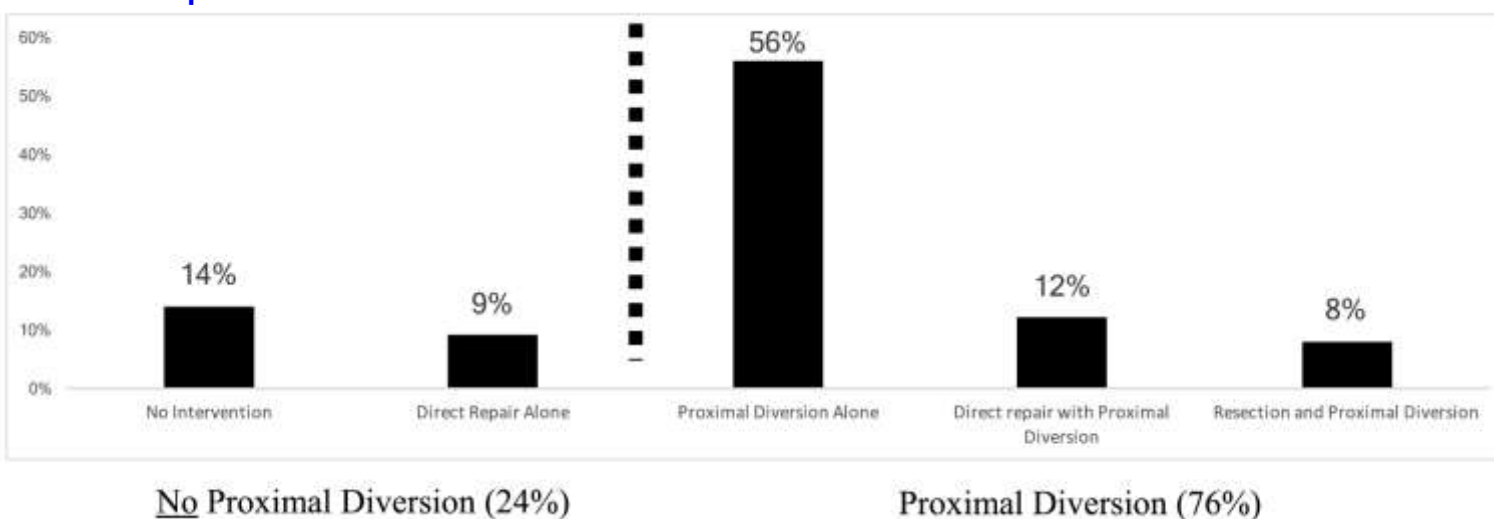
28%	I	Hematoma	Contusion or hematoma without devascularization
		Laceration	Partial thickness laceration
41%	II	Laceration	Laceration <50% circumference
13%	III	Laceration	Laceration ≥50% circumference
12%	IV	Laceration	Full-thickness laceration with extension into the perineum
5%	V	Vascular	Devascularized segment

Contemporary management of rectal injuries at Level I trauma centers: The results of an American Association for the Surgery of Trauma multi-institutional study

INTRA-peritoneal



EXTRA-peritoneal

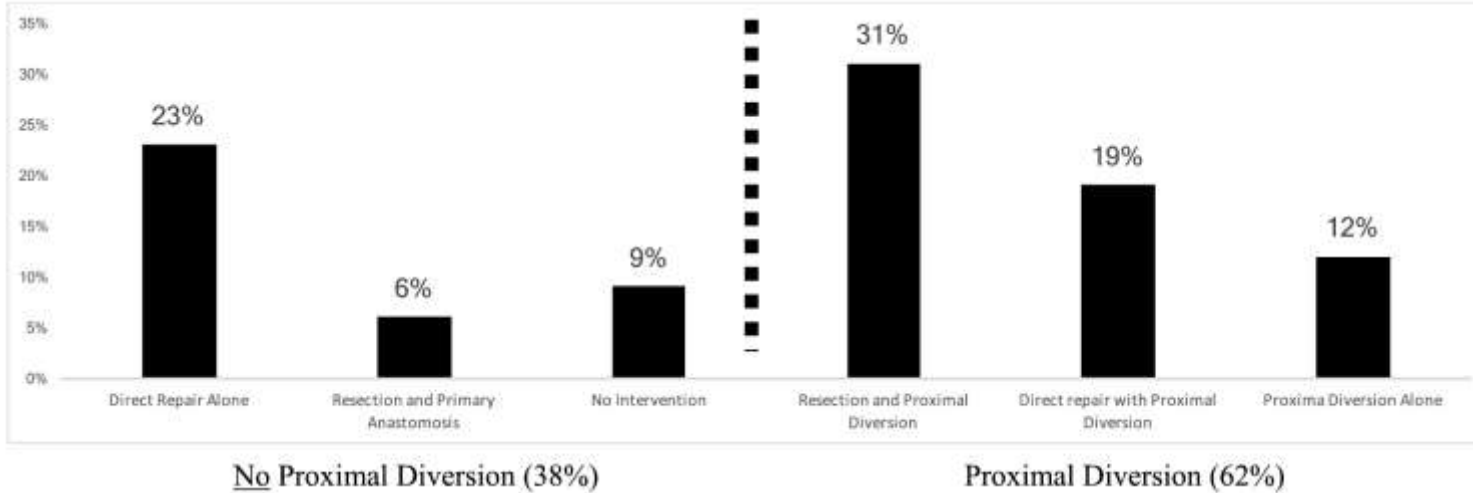


2004-2015, 22 centers, 785 patients

J Trauma Acute Care 2018

Contemporary management of rectal injuries at Level I trauma centers: The results of an American Association for the Surgery of Trauma multi-institutional study

INTRA-peritoneal



→ Stoma not associated with improved outcome

Abdominal complications :

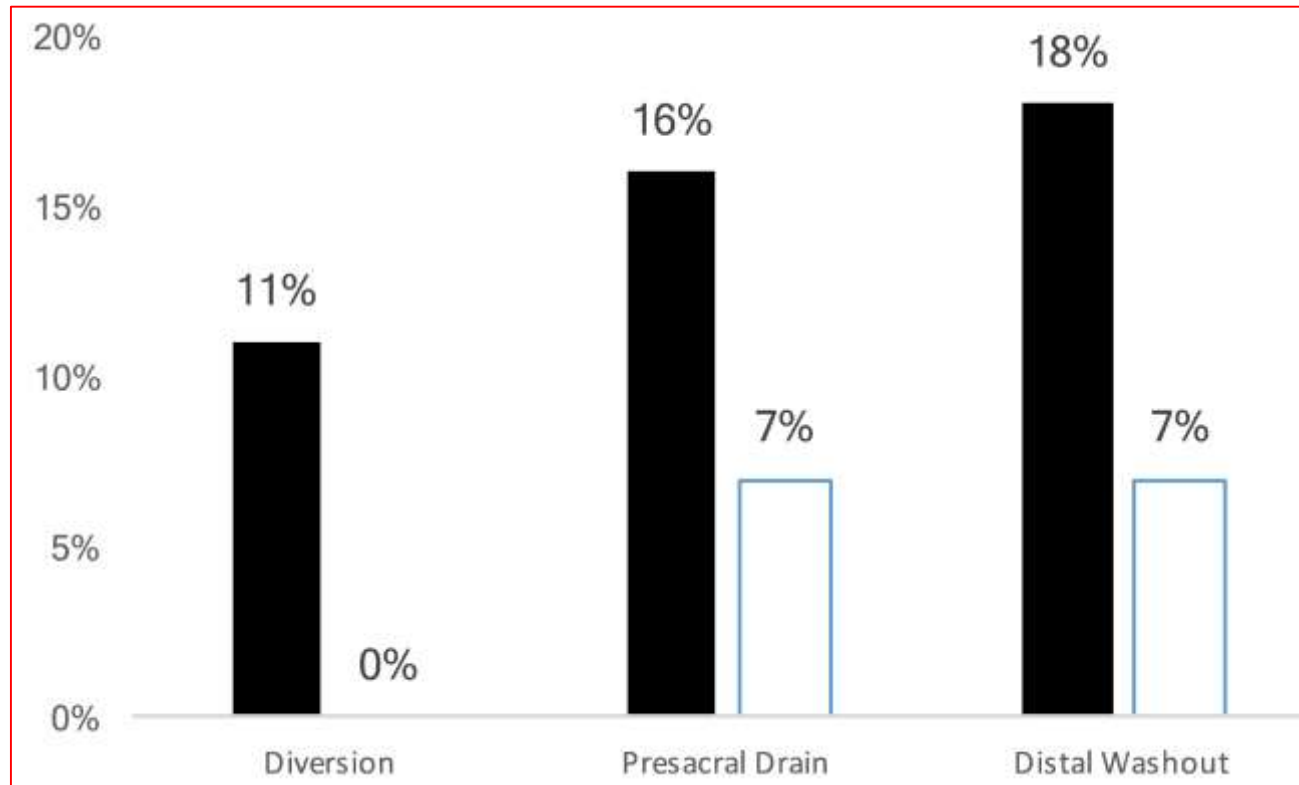
- w stoma 22% vs. 10% w/o stoma (p=0.003)
- High-grade injury OR 2.6
- Penetrating mechanism OR 2.7

Mortality same w or W/o stoma (3% vs 2%)

Contemporary management of rectal injuries at Level I trauma centers: The results of an American Association for the Surgery of Trauma multi-institutional study

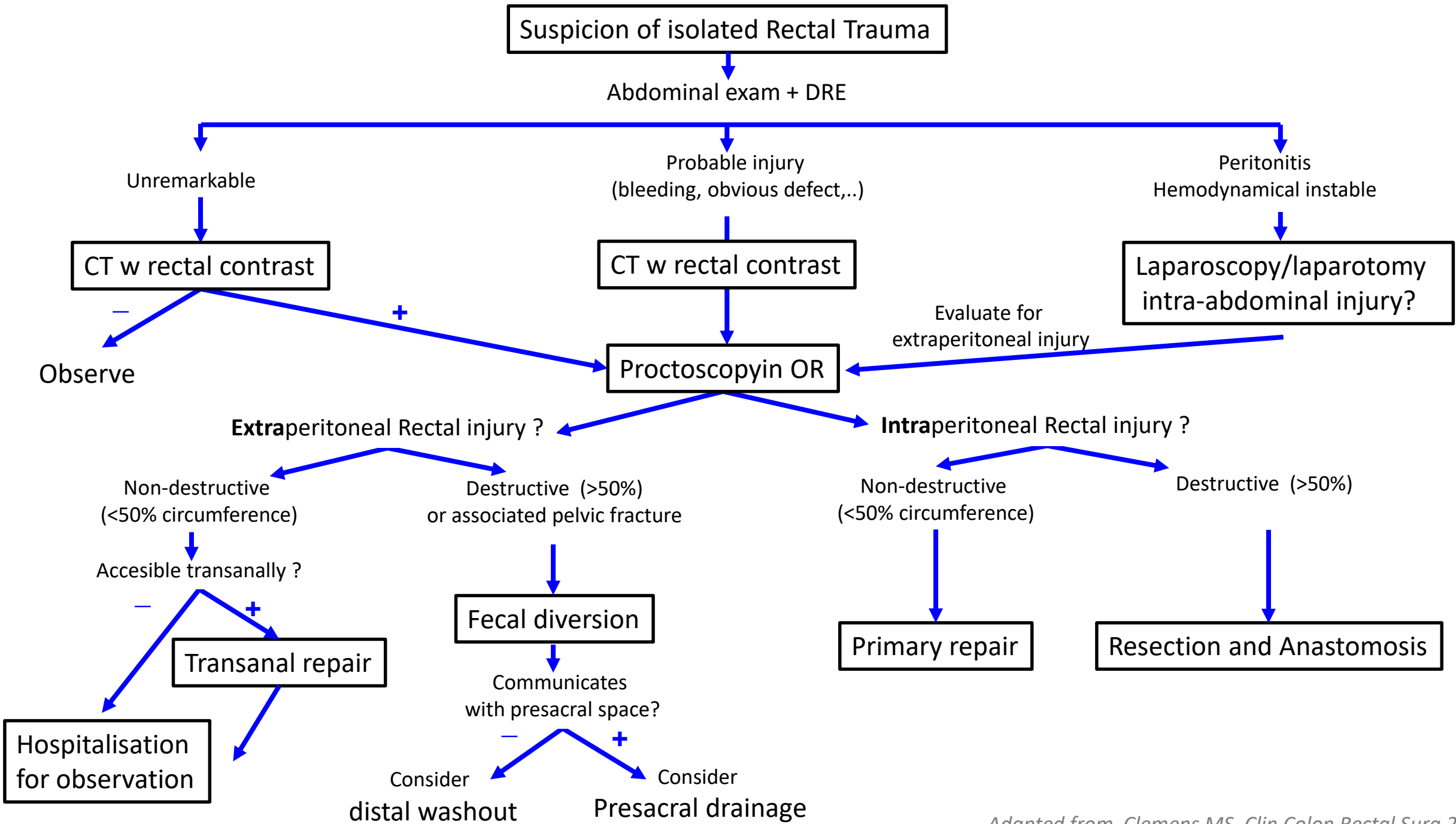
EXTRA-peritoneal

■ stoma □ no stoma



→ Presacral drain and rectal wash out of no benefit

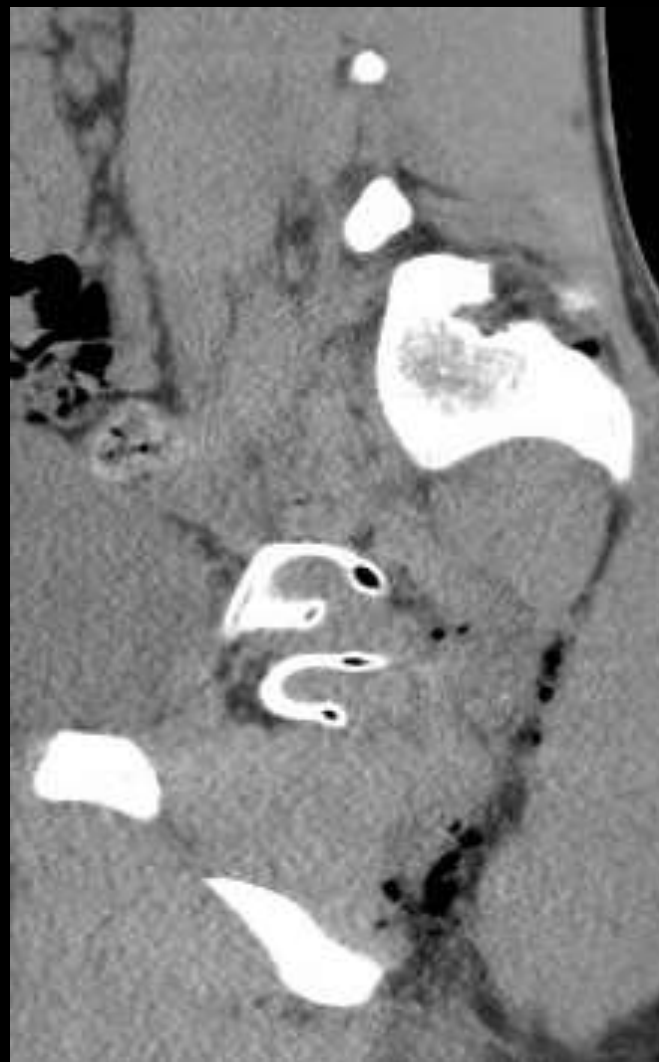
Abdominal complications OR 3.4 OR 2.6



Rectal Injury

- Examination of the abdomen + DER
- CT with rectal contrast (early detection of any visceral injury)
- Intraperitoneal lesions : treat similar to colon lesions
- Extraperitoneal lesions
 - Upper 2 thirds + accessible lower third: primary repair +/- stoma
 - Lower inaccessible lesions: presacral drainage + stoma

23yrs, farmer
- Fell off tractor





22nd **ALPINE** **COLORECTAL MEETING**

24th-26th January 2021

Video Session

State of the Art Lectures

Trial updates

Debate

www.alpinecolorectal.org