

Abdominal Injury with Shock

Jumping into abdomen.

Just do it ?

นพ.เอกกิตติ์ สุรการ

ศูนย์อุบัติเหตุกรุงเทพ

โรงพยาบาลกรุงเทพ สำนักงานใหญ่

What is it ?

Where is it ?

Exploratory Laparotomy

Case 1

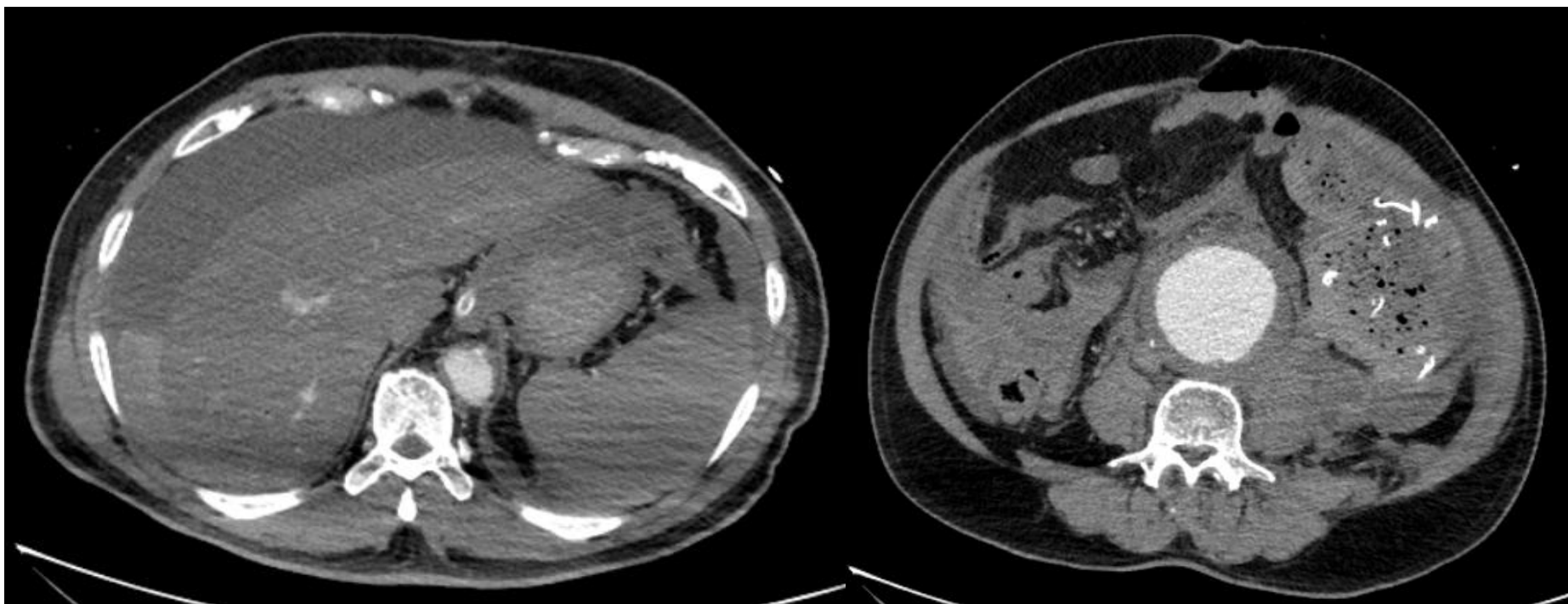
Old man, Underlying HT

Motorcycle accident: Slow ride, low impact

Alert and able to walk, then collapse.

At primary hospital

- Hypotensive
- Fast – Positive, Free peritoneal fluid





Emergency Radiodiagnosis

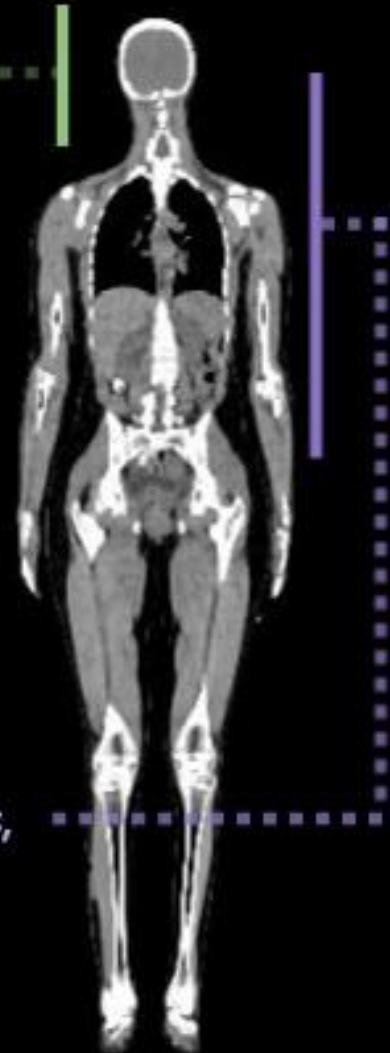
- X-Ray
- Ultrasound
- CT Scan

Whole Body CT (WBCT)

1. Non-contrast head, cervical spine

2. IV contrast enhanced imaging of the chest, abdomen and pelvis

3. 3D reconstructions of the cervical, thoracic, and lumbar spine







The CT scan, ATLS 9th

ASSESSMENT 131

PITFALL

Factors that compromise the utility of ultrasound are obesity, the presence of subcutaneous air, and previous abdominal operations.

Diagnostic Peritoneal Lavage DPL is another rapid study to identify hemorrhage. Although invasive, it also allows investigation of possible hollow viscus injury. DPL can significantly alter subsequent examinations of the patient and is considered 98% sensitive for intraperitoneal bleeding (see FIGURE 5-7). It should be performed by a surgical team caring for a patient with hemodynamic abnormalities and multiple blunt injuries, and may also be useful in penetrating trauma.

DPL also is indicated in hemodynamically normal patients with blunt injury when ultrasound or computed tomography (CT) is not available. In settings with either or both of these modalities available, DPL is rarely used, as it is invasive and requires some surgical expertise.

Relative contraindications to DPL include previous abdominal operations, morbid obesity, advanced cirrhosis, and preexisting coagulopathy. Either an open or closed (Seldinger) intraumbilical technique is acceptable in the hands of trained clinicians. In patients with pelvic fractures, an open supraumbilical approach is preferred to avoid entering a pelvic hematoma. In patients with advanced pregnancy, an open suprafundal approach should be used to avoid damaging the enlarged uterus. Free aspiration of blood, gastrointestinal contents, vegetable fibers, or bile through the lavage catheter in patients with hemodynamic abnormalities mandates laparotomy.

If gross blood (>10 mL) or gastrointestinal contents are not aspirated, lavage is performed with 1000 mL of warmed isotonic crystalloid solution (10 mL/kg in a child).

After ensuring adequate mixing of peritoneal contents with the lavage fluid by compressing the abdomen and moving the patient by logrolling or tilting him or her into head-down and head-up positions, the effluent is sent to the laboratory for quantitative analysis if gastrointestinal contents, vegetable fibers, or bile are not obviously present. A positive test is indicated by >100,000 red blood cells (RBC/mm³), 500 white blood cells (WBC/mm³), or a Gram stain with bacteria present. See Skill Station 8C: Diagnostic Peritoneal Lavage.

Computed Tomography CT is a diagnostic procedure that requires transport of the patient to the scanner, administration of contrast, and scanning of the upper and lower abdomen, as well as the lower chest



FIGURE 5-7 Diagnostic Peritoneal Lavage (DPL). DPL is a rapidly performed, invasive procedure that is considered 98% sensitive for intraperitoneal bleeding.

and pelvis. It is a time-consuming procedure that should be used only in hemodynamically normal patients in whom there is no apparent indication for an emergency laparotomy. The CT scan provides information relative to specific organ injury and its extent, and can diagnose retroperitoneal and pelvic organ injuries that are difficult to assess with a physical examination, FAST, and peritoneal lavage. Relative contraindications to the use of CT include delay until the scanner is available, an uncooperative patient who cannot be safely isolated, and allergy to the contrast agent when non-ionic contrast is not available. CT can miss some gastrointestinal, diaphragmatic, and pancreatic injuries. In the absence of hepatic or splenic injuries, the presence of free fluid in the abdominal cavity suggests an injury to the gastrointestinal tract and/or its mesentery, and many trauma surgeons find this to be an indication for early operative intervention.

Contrast Studies A number of contrast studies can aid in the diagnosis of specifically suspected injuries, but they should not delay the care of patients who are hemodynamically abnormal. These include:

- Urothorography
- Cystography
- Intravenous pyelogram
- Gastrointestinal contrast studies

Urothorography should be performed before inserting an indwelling urinary catheter when a ure-

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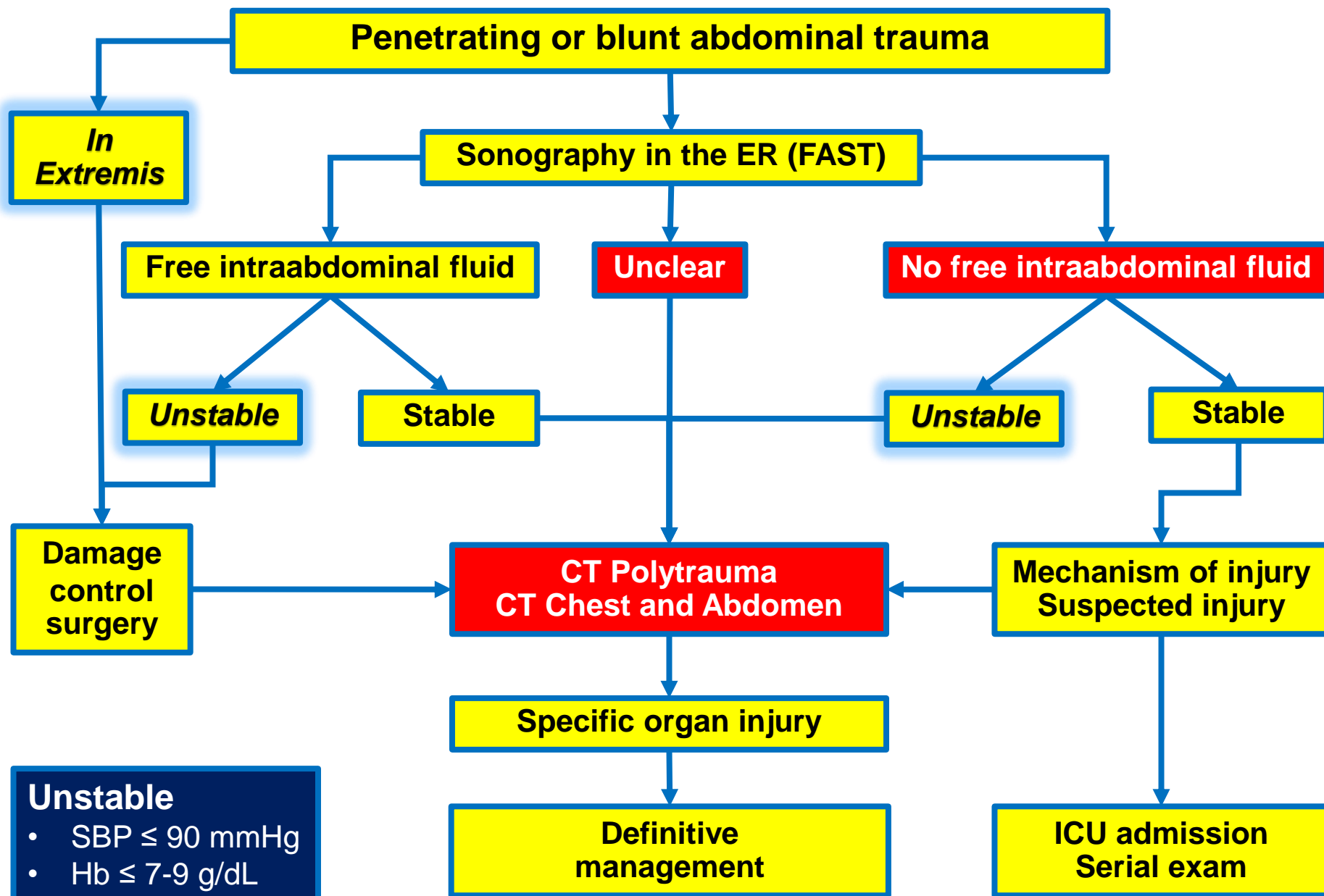
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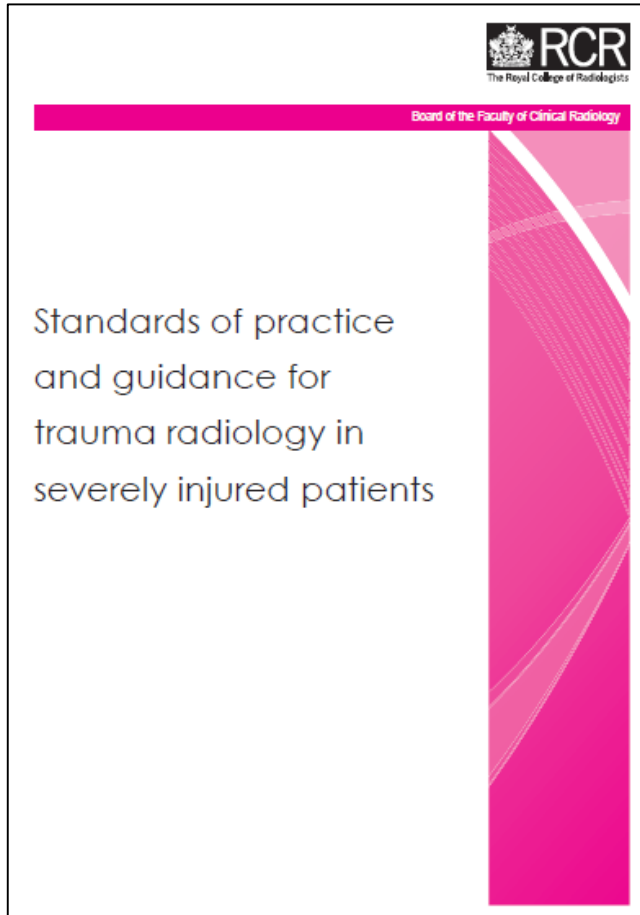
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- A time-consuming procedure
- That should be used *only in hemodynamically normal patients*
- In whom there is no apparent indication for an emergency laparotomy.



Modified from Interdisciplinary Emergency Room Protocol 2016, DGU

“Circumstance where imaging is inappropriate...”



- Profound shock
- Not responds to fluid resusc.
- Site of bleeding is clear by
 - *Mechanism of injury*
 - *Rapid assessment*

RCR and the NHS Clinical Advisory Groups
in Regional Trauma Networks, June 2011

Any unexpected findings ?

“Expect for unexpected in trauma.”

Blunt abdominal trauma with unexpected anaphylactic shock due to rupture of hepatic hydatid cysts

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Case 2

Young man, Sitting passenger

Car accident, Head on collision at 100 Km/hr

Rear passenger + Seat belt

Severe pain at

- Chest
- Back
- Abdomen

Triage <input type="checkbox"/> 1= Super Red <input checked="" type="checkbox"/> 2= Red <input type="checkbox"/> 3= Yellow <input type="checkbox"/> 4= Green <input type="checkbox"/> 5= White		BW.(kg) 65	HT.(cm) 171	T.(°C)	O2 Sat 100%	BP (mmHg) 110/79	PR. (/min) 110	RR. (/min) 24
Triage Nurse <i>Adrian</i> Time Arrival 18:23 Time to MD 18:24		Est. - Stated	Est. - Stated	T-O-A-R	RA-LA-RL-LL	Reg - Irreg	Norm - Ab	
Arrival Vehicle: <input checked="" type="checkbox"/> Walk-in <input type="checkbox"/> Refer <input type="checkbox"/> Ambulance <input type="checkbox"/> EMS <input type="checkbox"/> Other		Escort: <input type="checkbox"/> None <input type="checkbox"/> Doctor <input type="checkbox"/> Nurse		General Appearance: <input type="checkbox"/> Good <input checked="" type="checkbox"/> Sick <input type="checkbox"/> Bed Ridden				
Ambulation: <input checked="" type="checkbox"/> Walk <input type="checkbox"/> Walking Aid <input type="checkbox"/> Carried <input type="checkbox"/> Wheelchair <input type="checkbox"/> Stretcher <input type="checkbox"/> Other		Fall precaution: <input type="checkbox"/> Standard <input checked="" type="checkbox"/> Strict Precaution						

Pre-Hospital Care by _____ Treatment prior to arrival: _____

Airway	Breathing	Circulation	Disability
<input type="checkbox"/> NSF Obstruction: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Adjunct Airway <input type="checkbox"/> OPA <input type="checkbox"/> NPA <input type="checkbox"/> Other Definite Airway → Patency <input type="checkbox"/> Orotracheal <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Nasotracheal Confirmed by <input type="checkbox"/> Tracheostomy <input type="checkbox"/> CO2 Detector <input type="checkbox"/> Cricothyroidotomy <input type="checkbox"/> Et CO2 <input type="checkbox"/> LMA <input type="checkbox"/> Auscultation <input type="checkbox"/> LTA Size No. _____ Fix at _____	<input type="checkbox"/> NSF <input type="checkbox"/> Dyspnea <input type="checkbox"/> Trachea: <input type="checkbox"/> Midline <input type="checkbox"/> Deviated to <input type="checkbox"/> Tachypnea <input type="checkbox"/> Rt <u>Breath Sounds</u> Lt <input type="checkbox"/> Apnea <input type="checkbox"/> Clear <input type="checkbox"/> Creptitation <input type="checkbox"/> Rhonchi <input type="checkbox"/> Wheezing <input type="checkbox"/> Diminished <input type="checkbox"/> Absent <input type="checkbox"/> Percussion <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Dull	<input type="checkbox"/> NSF <input checked="" type="checkbox"/> Pale <input type="checkbox"/> Massive External Bleeding <input type="checkbox"/> Suspected Internal Bleeding	<input type="checkbox"/> NSF E 4 V 5 M 6 Rt <u>Pupil</u> Lt <input checked="" type="checkbox"/> Size 3 <input checked="" type="checkbox"/> <input type="checkbox"/> Reactive <input type="checkbox"/> <input type="checkbox"/> Sluggish <input type="checkbox"/> <input type="checkbox"/> Non-react <input type="checkbox"/> <u>Motor Power</u> Rt Lt <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Babinski <input type="checkbox"/>

C-spine ☐ NSF ☐ Pain ☐ No protection ☐ Hard collar ☐ Manual

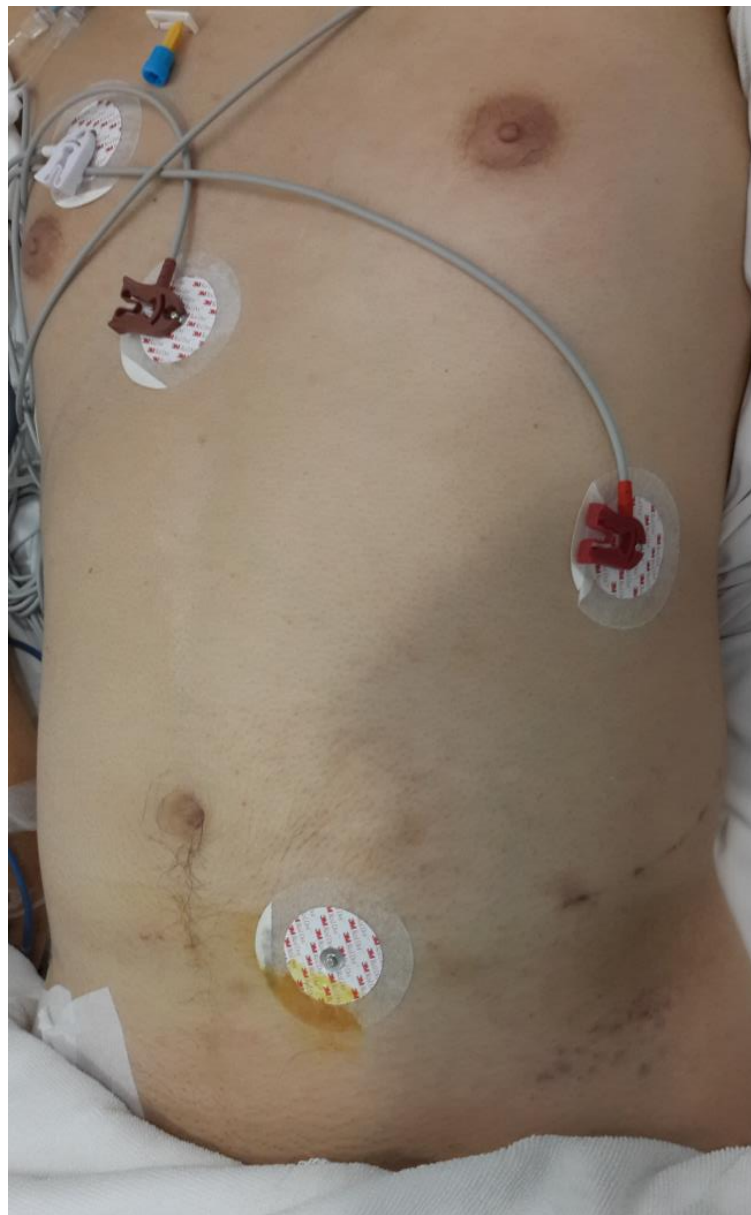
History ☐ See in refer report

*gasing arlor, blaso, bl vinda, bl mco
 isunon a, bl asin, bl asin, bl asin
 bl asin*

Exposure ☐ NSF ☐ Cold ☐ Heat ☐ Smoke ☐ Hazmat

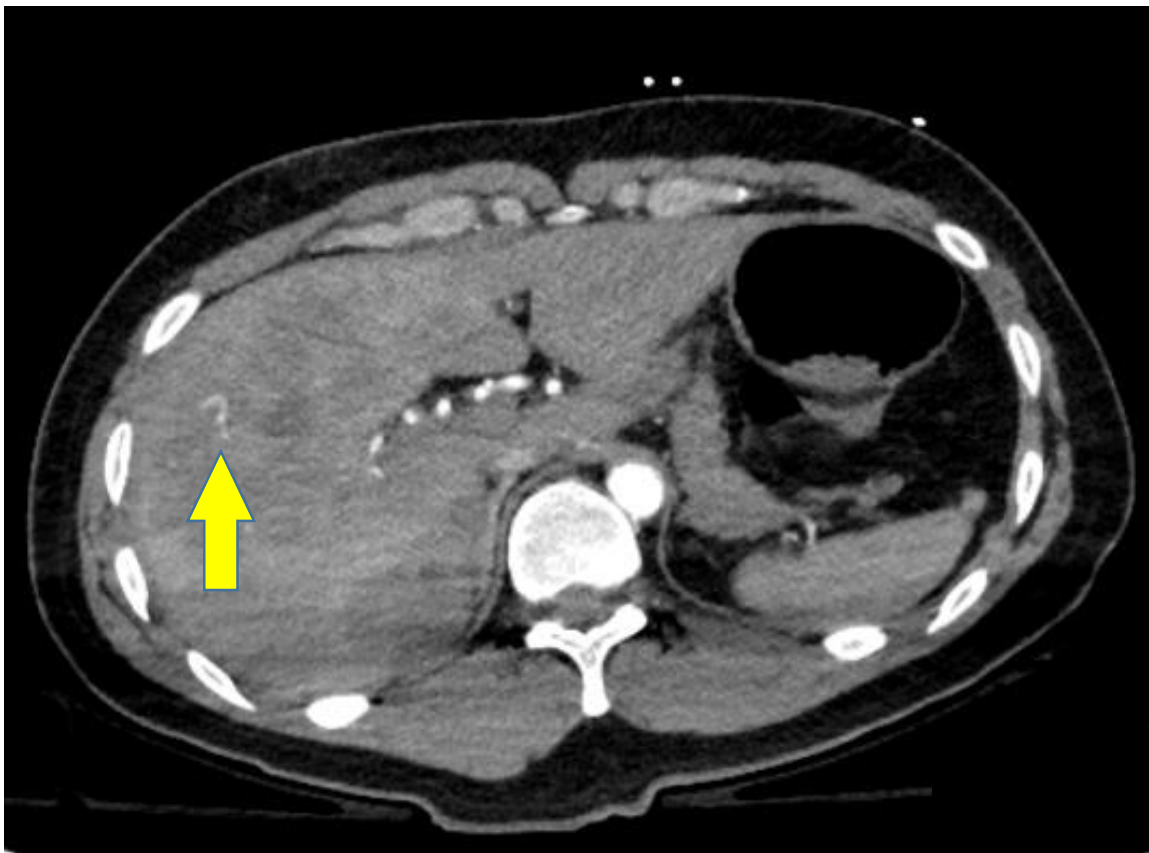
AMPLE	Adjunct and Findings
Allergy <input checked="" type="checkbox"/> Not known Medication <input checked="" type="checkbox"/> None Past history <input type="checkbox"/> Unremarkable <i>none</i>	<input checked="" type="checkbox"/> NG Tube <input checked="" type="checkbox"/> Foley cath <input checked="" type="checkbox"/> CXR <i>3 off</i> <input checked="" type="checkbox"/> Film Pelvis <input type="checkbox"/> Film C-Spine <input type="checkbox"/> DPL <input checked="" type="checkbox"/> EKG <input type="checkbox"/> EtCO2 <input checked="" type="checkbox"/> FAST : 4PS

<input type="checkbox"/> LTA Size No. Fix at		<input checked="" type="checkbox"/> <u>Percussion</u> <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Dull		<input type="checkbox"/> Babinski <input type="checkbox"/>	
C-spine <input type="checkbox"/> NSF <input type="checkbox"/> Pain <input type="checkbox"/> No protection <input type="checkbox"/> Hard collar <input type="checkbox"/> Manual		Exposure <input type="checkbox"/> NSF <input type="checkbox"/> Cold <input type="checkbox"/> Heat <input type="checkbox"/> Smoke <input type="checkbox"/> Hazmat		AMPLE	
History <input type="checkbox"/> See in refer report		Allergy <input checked="" type="checkbox"/> Not known		Adjunct and Findings	
95% lung expansion, bilateral, the breath, the mucus 100% clear, the mucus, the mucus the mucus		Medication <input checked="" type="checkbox"/> None		<input checked="" type="checkbox"/> NG Tube <input checked="" type="checkbox"/> Foley cath <input checked="" type="checkbox"/> CXR <input checked="" type="checkbox"/> Film Pelvis <input type="checkbox"/> Film C-Spine <input type="checkbox"/> DPL <input checked="" type="checkbox"/> EKG <input type="checkbox"/> ECG	
		Past history <input type="checkbox"/> Unremarkable none		<input checked="" type="checkbox"/> FAST : 4pg 10pg : slightly dsm (+) 3L	
		LMP		Last meal at 17:00h	
EENT		Respiratory <input checked="" type="checkbox"/> NSF		Abdomen <input type="checkbox"/> NSF	
<input checked="" type="checkbox"/> NSF Rt Lt <input type="checkbox"/> Conjunct Hemorrhage <input type="checkbox"/> <input type="checkbox"/> Corneal Ulcer <input type="checkbox"/> <input type="checkbox"/> Hyphema <input type="checkbox"/> <input type="checkbox"/> Rupture <input type="checkbox"/> <input type="checkbox"/> Impaired vision <input type="checkbox"/> EOM :		<input type="checkbox"/> Normal Effort <input type="checkbox"/> Nasal Flaring <input type="checkbox"/> Retractions <input type="checkbox"/> Stridor		<input checked="" type="checkbox"/> Guarding <input type="checkbox"/> Rigidity <input checked="" type="checkbox"/> Tender	
<input checked="" type="checkbox"/> NSF Rt Lt <input type="checkbox"/> Blood <input type="checkbox"/> <input type="checkbox"/> CSF <input type="checkbox"/>		<input type="checkbox"/> Normal Effort <input type="checkbox"/> Nasal Flaring <input type="checkbox"/> Retractions <input type="checkbox"/> Stridor		<input type="checkbox"/> GU/GYN <input type="checkbox"/> NSF	
<input checked="" type="checkbox"/> NSF Rt Lt <input type="checkbox"/> Blood <input type="checkbox"/> <input type="checkbox"/> CSF <input type="checkbox"/>		<input checked="" type="checkbox"/> <u>Breath Sounds</u> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Clear <input checked="" type="checkbox"/> <input type="checkbox"/> Crepitation/Rales <input type="checkbox"/> <input type="checkbox"/> Rhonchi <input type="checkbox"/> <input type="checkbox"/> Wheezing <input type="checkbox"/> <input type="checkbox"/> Diminished <input type="checkbox"/> <input type="checkbox"/> Absent <input type="checkbox"/> <input checked="" type="checkbox"/> <u>Percussion</u> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Normal <input checked="" type="checkbox"/> <input type="checkbox"/> Dull <input type="checkbox"/>		<input type="checkbox"/> Dysuria <input type="checkbox"/> Flank Pain <input type="checkbox"/> Hematuria <input type="checkbox"/> Right <input type="checkbox"/> Blood at meatus <input type="checkbox"/> Left <input type="checkbox"/> Frequency <input type="checkbox"/> Incontinent PR <input type="checkbox"/> Not done <input type="checkbox"/> Blood in rectum <input type="checkbox"/> High lying prostate Rectal Tone: <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> NA Bulbocavernosus Reflex <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> NA	
Extremities <input checked="" type="checkbox"/> NSF		<input type="checkbox"/> Deformity - see in body diagram		Injured limb	
		<input type="checkbox"/> Sensory <input type="checkbox"/> Cap. refill Good Impair Good Slow		Right ARM Right LEG Left ARM Left LEG	
		Pelvis: <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Unstable		Back: <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Tender	

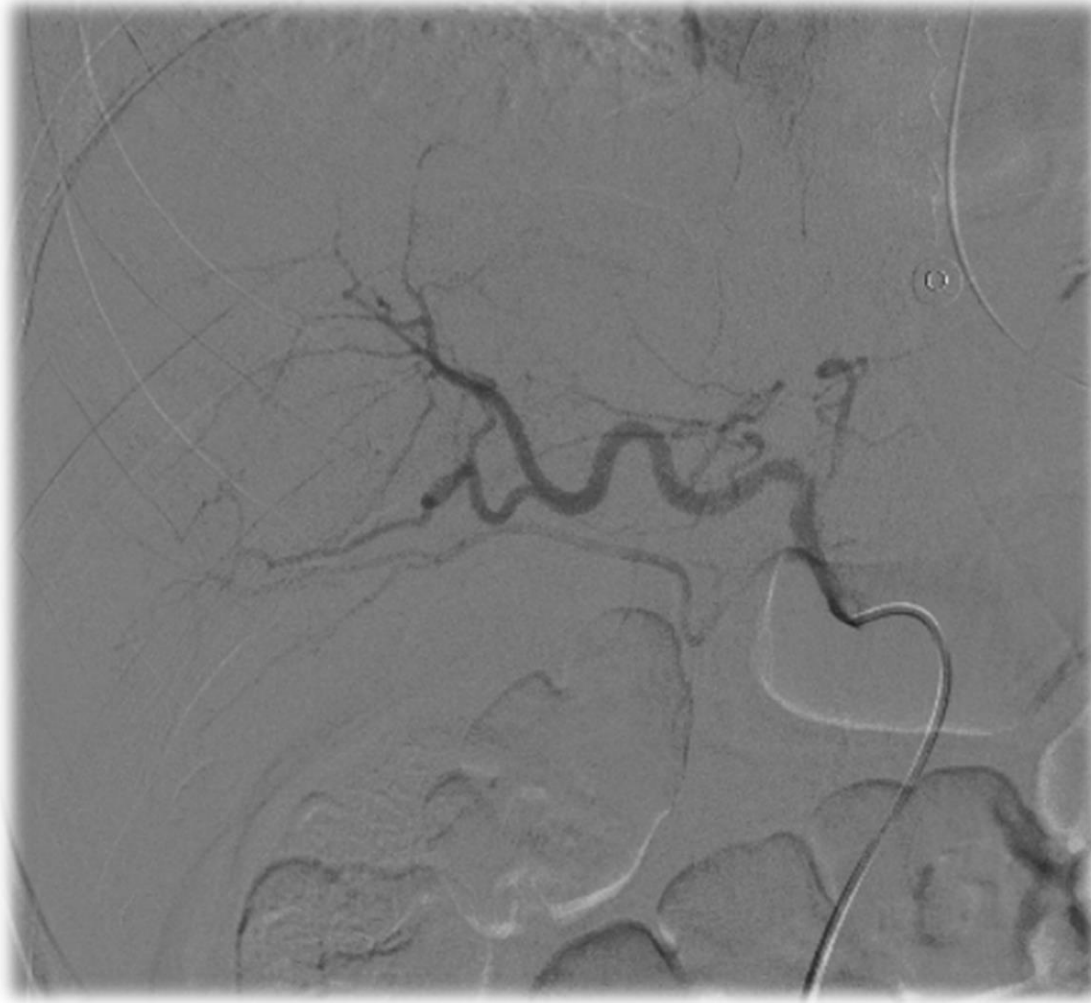












“No arterial bleeding, go packing.”

Abdominal Injury with Shock

- Trauma team activation
- Damage control resuscitation
 - *Controlled hypotension*
 - *Hemostatic resuscitation*
- Identify source of bleeding
- Damage control surgery
- Back up: Blood products, Radio intervention