ABDOMINAL TRAUMA

Lecture

Prof. Zbigniew Wlodarczyk

Epidemiology

2% of all traumas (4% amongst hospitalized patients)

75% M 25% F

Average age 35 years

80% close

20% penetrating

40% liver and spleen, 10% jejunum, 5 % colon

Dominant symptoms: 75% intraabdominal hemorrhage, 25% peritonitis

Mechanisms of trauma

Deceleration: tears, disruptions

Crashing: solid organs

External compression: hollowed organs: stomach, bowels, bladder

Low energy penetration: stab wounds

High energy (high velocity) penetrations: shot wounds, mechanism of cavitation

Action at the site of accident

1. Primary examination: open or close trauma
2. Patient's general condition – stable vs unstable hemodynamically
3. Venous access
4. Short-acting analgetics
5. Treatment of hypovolemia (rule of 100)
6. What about penetrating items ?
7. Wet dresing if evisceration (do not retract)
8. Every significant AT – transport to the hospital
9. Continous and repeated monitoring during transport
10. Warning to the target hospital

Accident and Emergency Room

Patient stable

1. Continous patient monitoring

2. Blood group and #match

3. Medical history
closed trauma
type of trauma, inensivity, place in the car,
position during accident, speed of the car

penetrating trauma
object (type, size, direction)
shot wounds (type of gun, distance, calliber)

Accident and Emergency Room

Patient stable

Wywiad (cd)
umiejscowienie bólu
nasilenie, zalezność od pozycji, ruchu
promieniowanie
krwiomocz

Badanie przedmiotowe
Chory rozebrany
Badanie ściany przedniej, bocznych, pleców i krocza
Zewnętrzne ślady urazów
Napięcie i bolesność powłok
Perystaltyka
Per rectum
Rany kłute – sondowanie niewskazane
Rany postrzałowe – na salę operacyjną

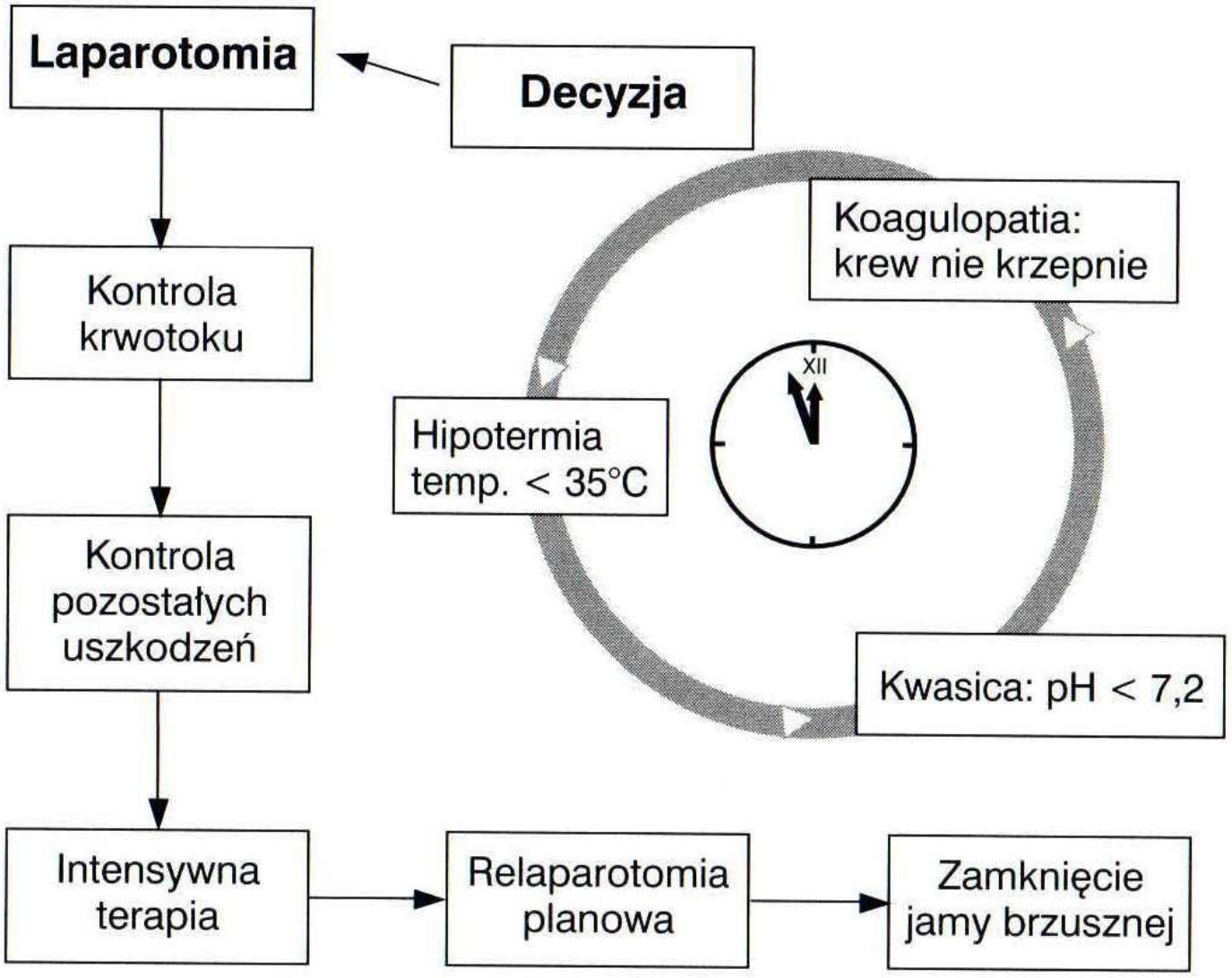
Accident and Emergency Room

Patient in deep shock

1. Combined trauma team
2. Intubation
3. Blod for blood group and #-match , possibly blood gasses.
   All ather lab tests – waste of time
4. Fast fluid transfusion

5. Diagnosis FAST (Focused Assesment with Sonography for Trauma
   -free fluid-injury to the solid organs in 80-90% cases
   -sensitivity 44-65% in diagnosis of the retroperitoneal injury
   -underestimates the extent of the injury

5. Damage Control



Kulig J, Nowak W, „Ostry Brzuch", PZWL 2009

Imaging

1. Chest X-ray

3. Abdominal X-ray - questionable usefulness

Imaging

1. Chest X-ray
2. Abdominal X-ray
3. FAST
4. CT with contrast or angio CT (vascular trauma)
5. DPL (Diagnostic Peritoneal Lavage)
6. GI Endoscopy

DECISION

conservative or operative treatment

Conservative – continous observation

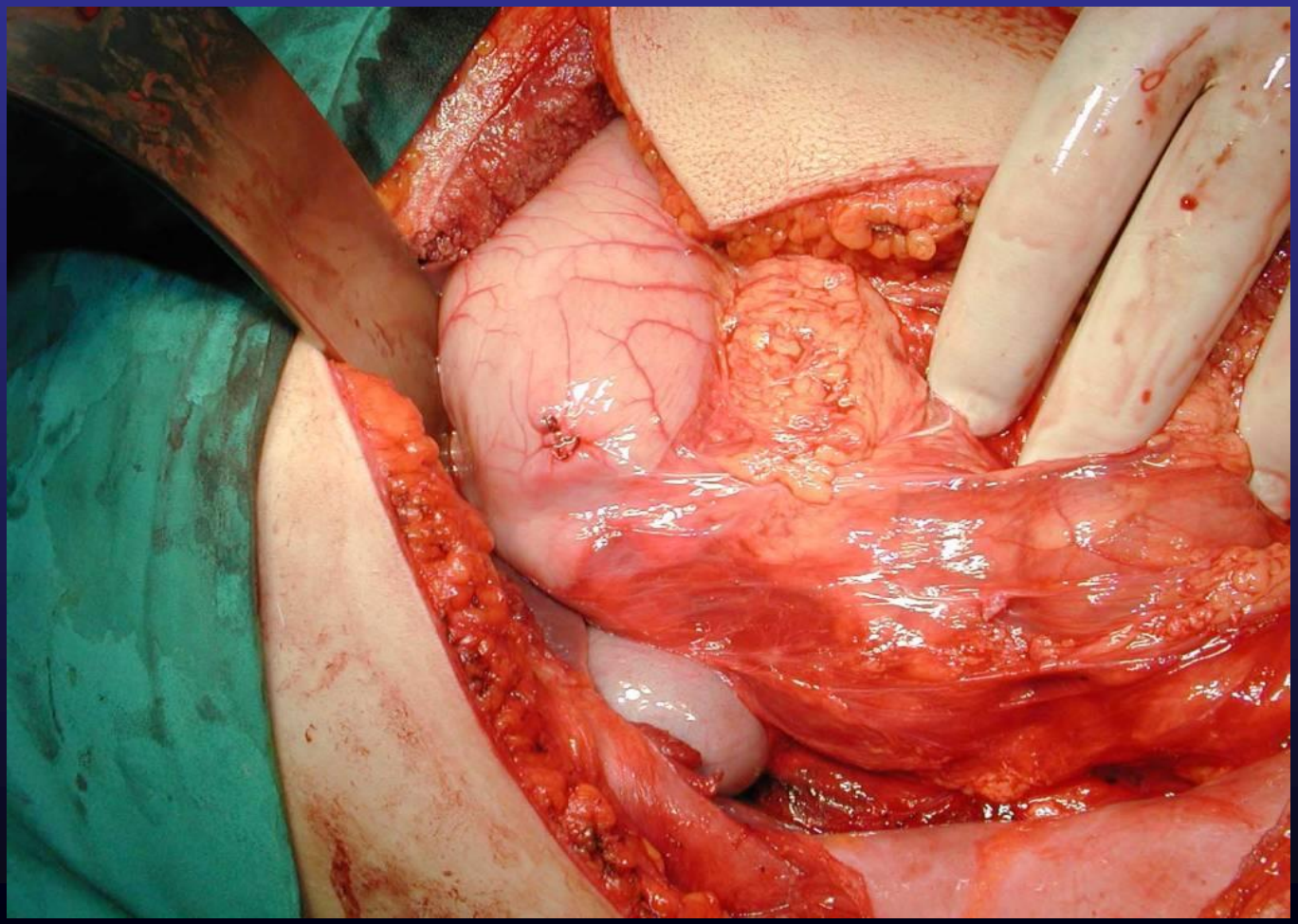
Operative – preparation for surgery

Stomach traumas

-Stab and shot wounds

-Rarely blunt trauma

-Operative treatment



Duodenal traumas

2-5% of all abdominal traumas

- stab and shot wounds – double wall penetration

-Blunt trauma –posterior wall, retroperitoneal leak

Symptoms

Operative treatment

difficult to repair

high mortality

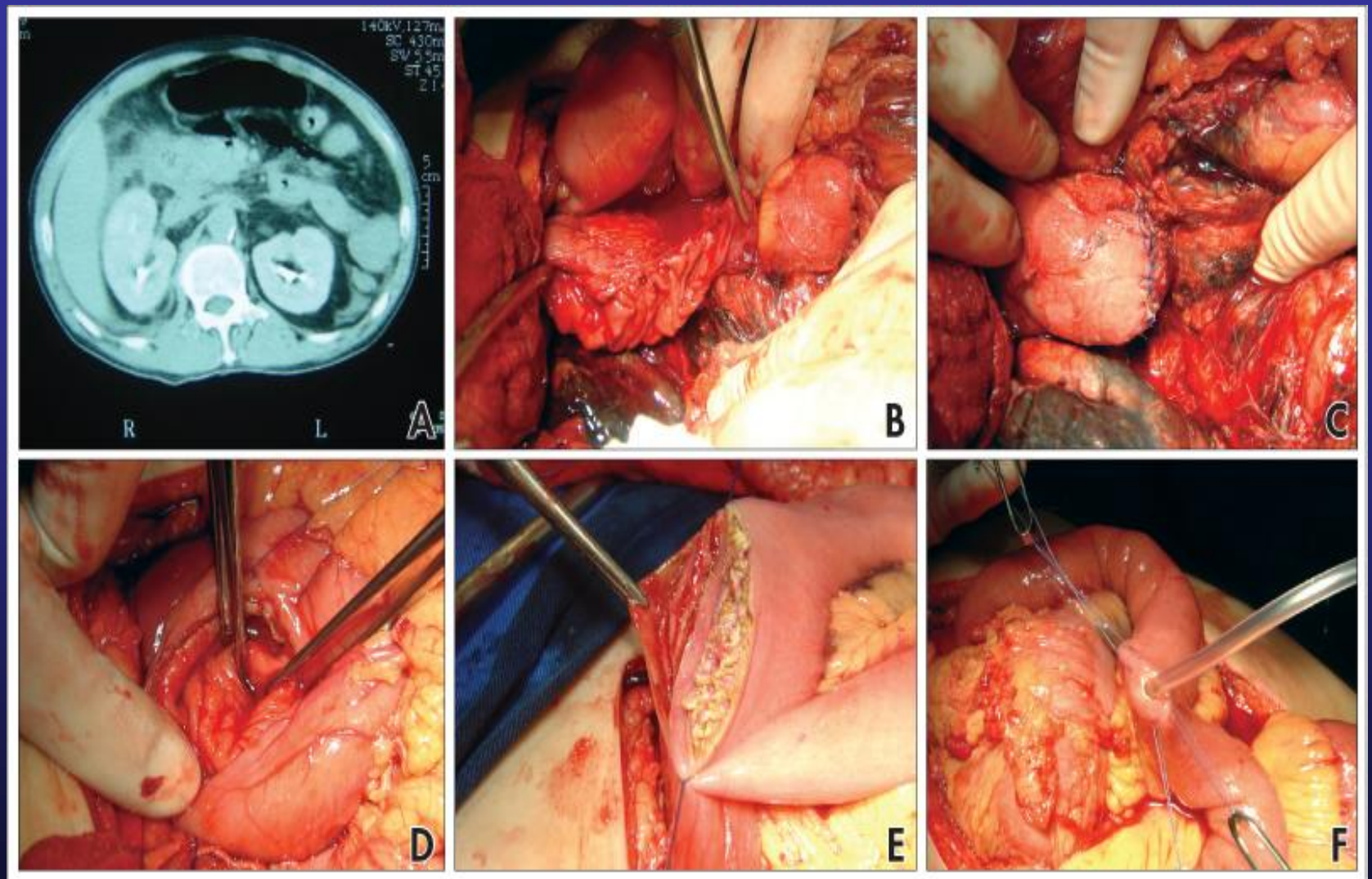


Figure 2. (A) Computed tomography showing air in retroperitoneum; (B) grade IV duodenal injury in third portion; (C) duodenal repair; (D) pylorus closed; (E) gastrojejunostomy; (F) feeding jejunostomy.

Small bowel traumas

grade	description
I	Wall contusion, haematona, no perforation
II	Full thickness wall damage <50% or multiple part thickness
III	Full thickness wall damage >50% , without desruption of the continuity
IV	desruption of the continuity
V	desruption of the continuity, ischaemia, segmental necrosis

Organ Injury Scaling wg Moore

Liver traumas

20% of all abdominal traumas

80% blunt

More frequently right lobe

grade	description
I	Subcapsular hematoma <10 cm, tear <1 cm
II	Subcapsular hematoma <50% surface, intralobar < 10 cm, tear <10 cm dł, <1 cm depth.
III	Subcapsular hematoma >50% surface, intralobar >10 cm, tear >3 cm depth.
IV	Damaged 25-75% of parenchyma, tear to 1-3 segments
V	Damaged >75% of parenchyma, tear to >3 segments
VI	Separation from large vessels

Organ Injury Scaling wg Moore

Liver traumas

Symptoms

- -pain
- -shock
- -peritoneal symptoms

Diagnosis

- -US

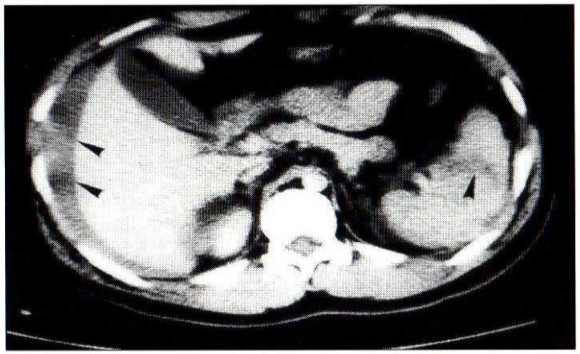
Ryc. 14.1. Krwiak śródwątrobowy widoczny w USG.

Ryc. 14.2. Rozerwanie miąższu wątroby i packing widoczne w USG.

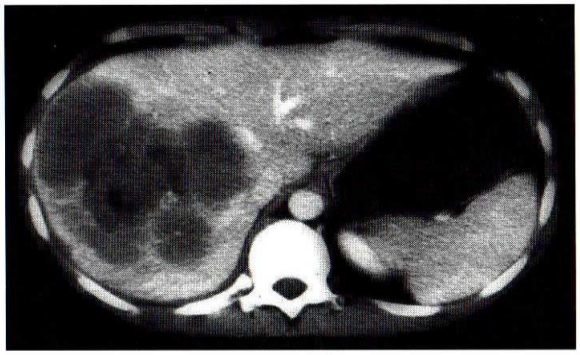
Kulig J, Nowak W, „Ostry Brzuch”, PZWL 2009

Diagnosis, cont.

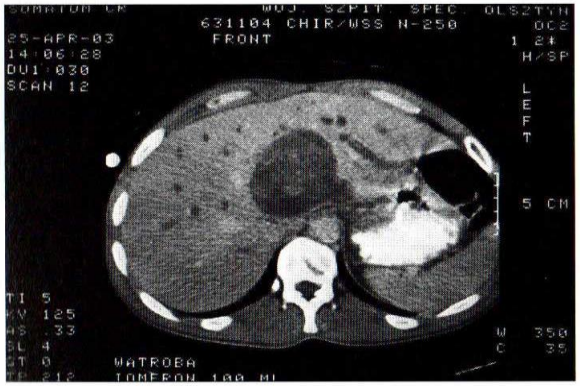
CT



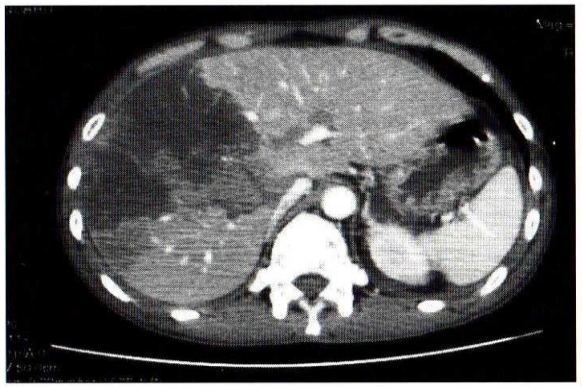
Ryc. 14.3. Krwiak podtorebkowy widoczny w tomografii komputerowej.



Ryc. 14.4. Krwiak śródwątrobowy widoczny w tomografii komputerowej.



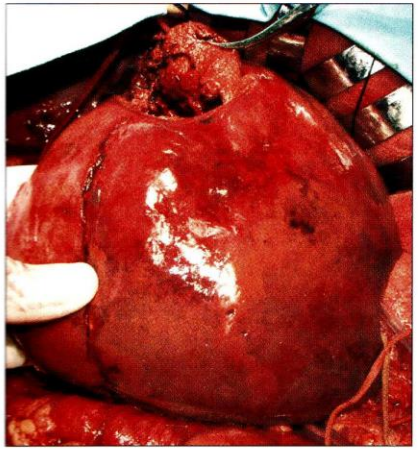
Ryc. 14.5. Inny krwiak śródwątrobowy widoczny w tomografii komputerowej.



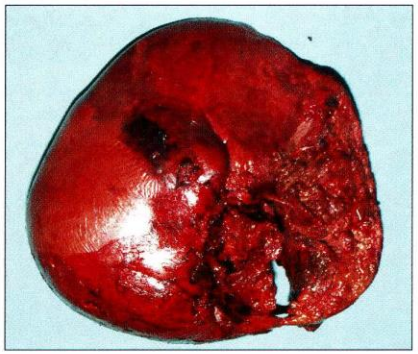
Ryc. 14.6. Krwiak z pęknięciem miąższu wątroby widoczny w tomografii komputerowej.

Kulig J, Nowak W, „Ostry Brzuch", PZWL 2009

Liver traumas - treatment

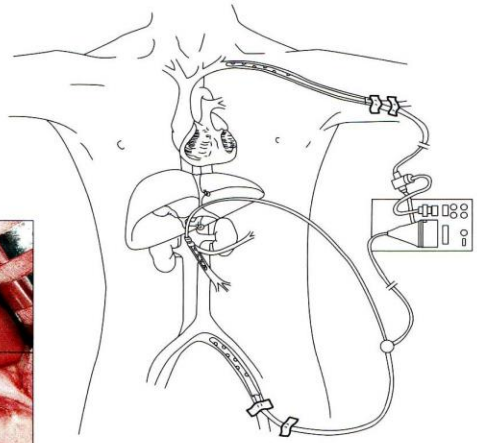


Ryc. 14.13. Urazowe pęknięcie prawego płata.



Ryc. 14.14. Inne urazowe pęknięcie prawego płata wątroby.

Ryc. 14.15. Stan po resekcji z powodu urazu wątroby.



Ryc. 14.16. Czasowy by-pass.

Kulig J, Nowak W, „Ostry Brzuch”, PZWL 2009

Spleen traumas

Mechanism

blunt trauma

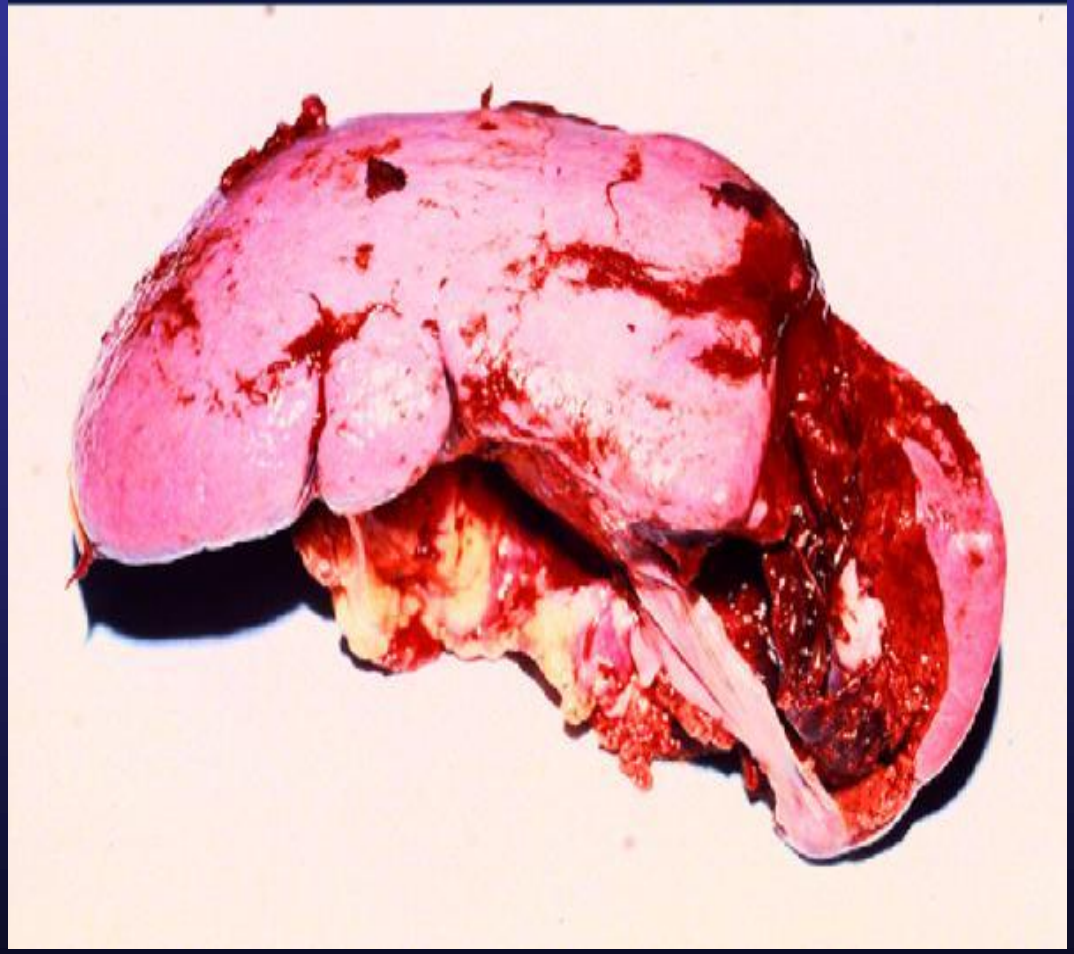
penetrating trauma

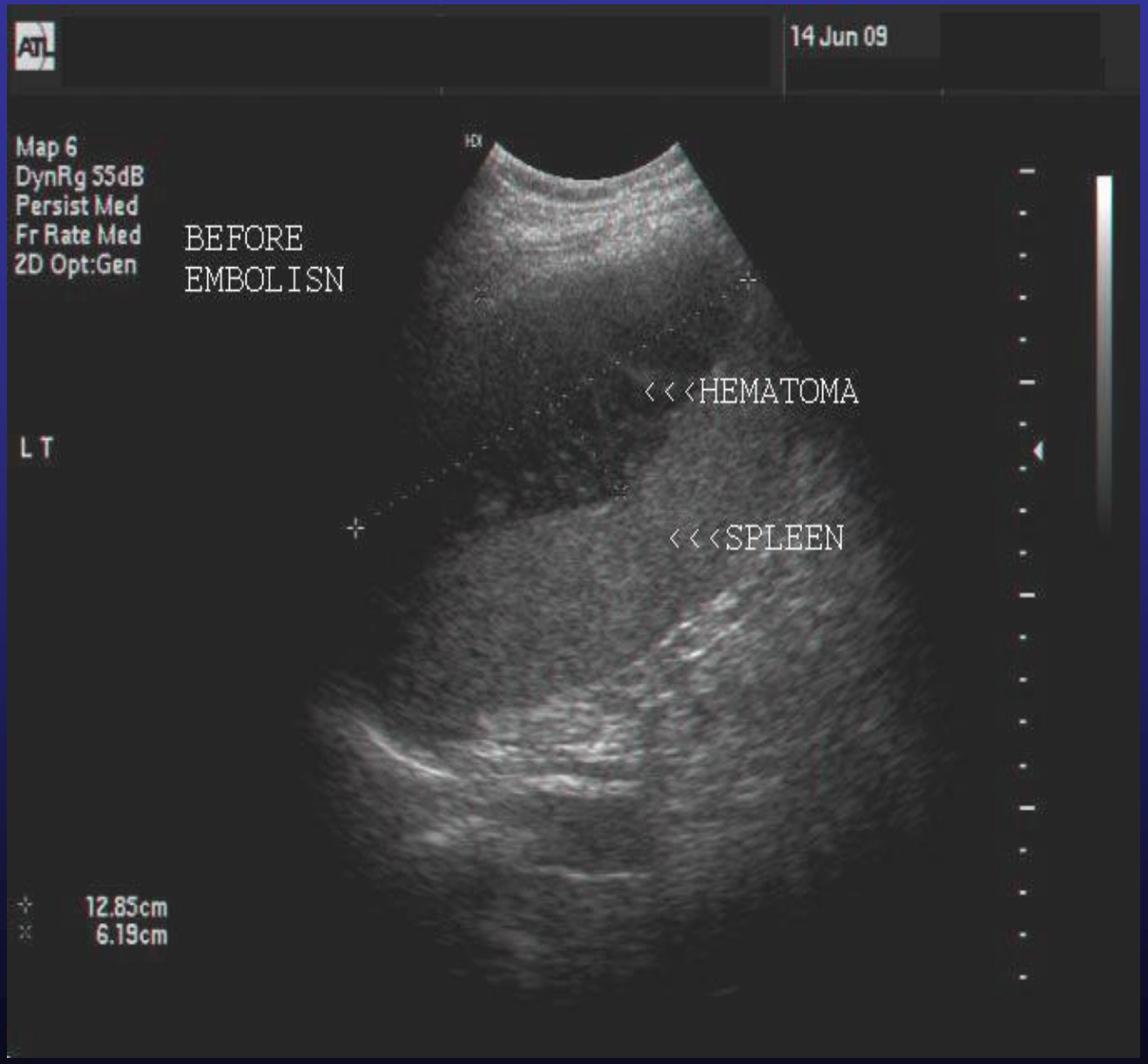
Grading

grade	description
I	Subcapsular hematoma <10 cm, tear <1 cm
II	Subcapsular hematoma <50% surface, intraparenchymal < 5 cm, tear <1 cm depth.
III	Subcapsular hematoma >50% surface, intraparenchymal > 5 cm, tear <3 cm depth.
IV	Damaged 25-75% of parenchyma
V	Disruption of parenchyma resulting in ischemia

Organ Injury Scaling wg Moore

SPLENIC TRAUMA




14 Jun 09
Map 6
DynRg 55dB
Persist Med
Fr Rate Med
2D Opt:Gen
BEFORE
EMBOLISN
<<<HEMATOMA
<<<SPLEEN
L T
12.85cm
6.19cm

Pancreatic traumas

<3% of all abdominal traumas

Mostly blunt trauma

Combined with injury to other organs

grade	description
I	Small hematoma, pancreatic duct intact
II	Large hematoma, pancreatic duct intact
III	Peripherial disruption of pancreas, pancreatic duct disrupted
IV	Head of the pancreas disrupted, pancreatic duct disrupted
V	Pancreas crushed into multiple fragments

Organ Injury Scaling wg Moore

Urinary tract traumas

-relatively common in abdominal traumas

-present in 3-10%

-mostly blunt traumas (80-90%) – car accidents

-deceleration mechanism

-penetrating traumas (ca 10%) – mostly iatrogenic

-isolated kidney injuries

-severe injuries combined with other intraabdominal organ injuries

-requires surgical treatment in 5-10% cases

Symptoms of kidney injury

- degree of hematuria and shok related to the severity of the trauma

- hematuria absent: disruption of the ureter, renal vessels torn off

- indications for CT

macroscopic hematuria

microscopic hematuria and shock (< 90 mmHg)

deceleration, fall, injury to the flank, fractions of the lower ribs or spine Th-L

Diagnostic imaging

Angiography

ia embolisation, stenting,

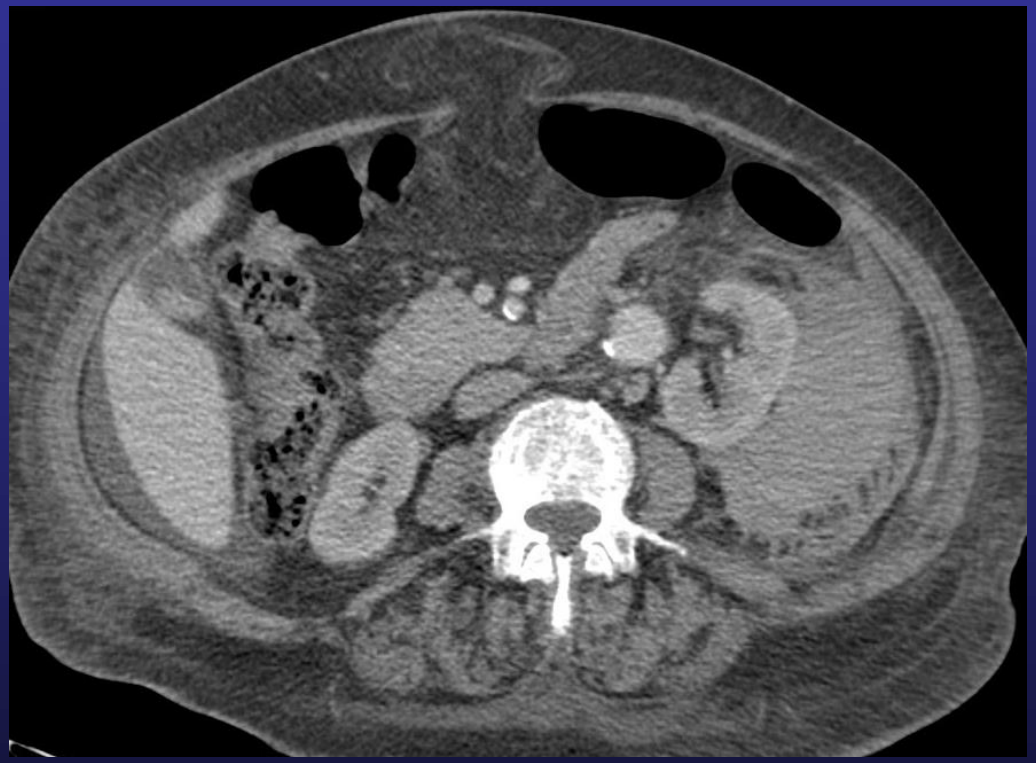
X-Ray

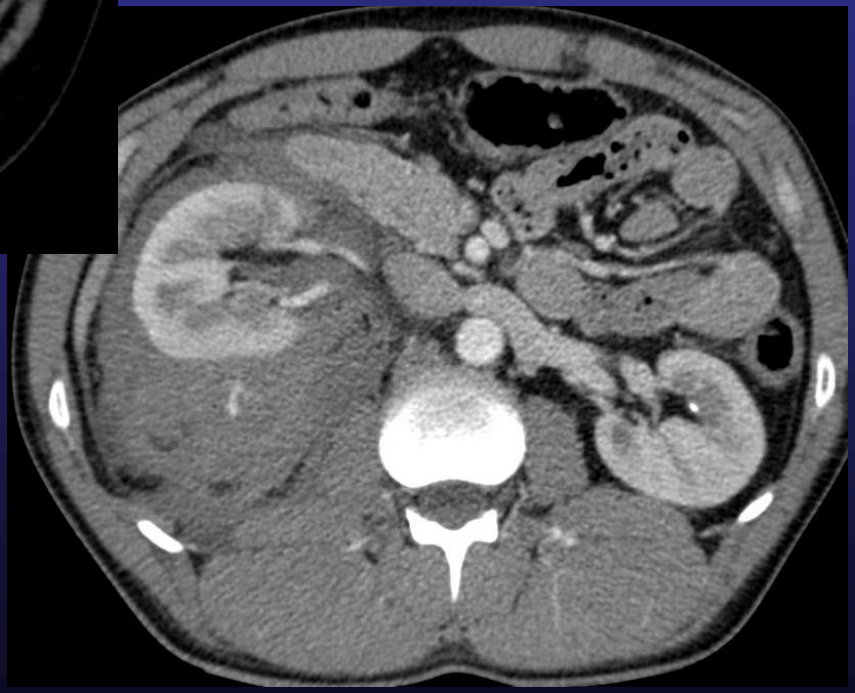
pelvic bones fractures, foreign bodies (objects)

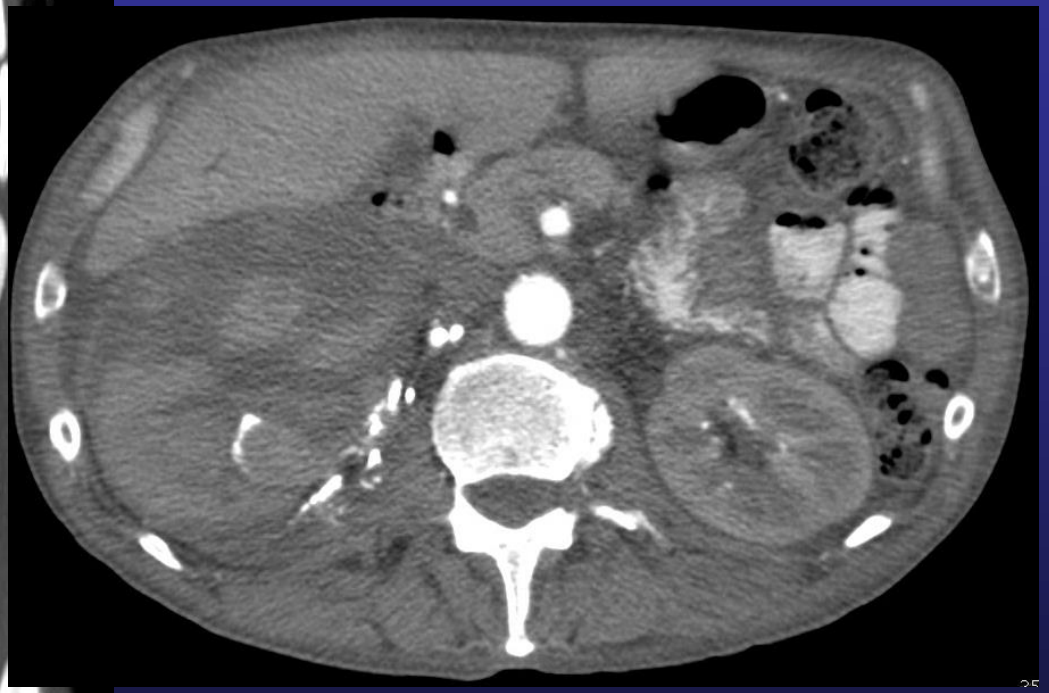
Urography

***one-shot intraoperative IVP* – if patient unstable**
2 ml/kg bw and one X-ray shot after 10 min.

grade	injury	Description
I	Contussion Hematoma	Macro/microhematuria Subcapsular hematoma
II	Hematoma Kidney disruption	Perirenal hematoma superficial kidney disruption < 1cm, collection system intact
III	Kidney disruption	Kidney disruption ≥1cm, collection system intact
IV	Kidney disruption Injury to the vessels	Kidney disruption,collection system disrupted Injury to the renal artery or vein with intrarenal hematoma, segmental infarct without kidney disruption
V	Kidney disruption Injury to the vessels	Kidney fragmented, ureter or renal vessels torn of Oderwanie szypuły lub zakrzepica z zawałem nerki
* grade I-III if affected bilaterally, increase the grade by 1.		







Urinary bladder traumas

-car accidents, falls, significant trauma to the lower abdomen

-in 60-90% combined with pelvic fractures

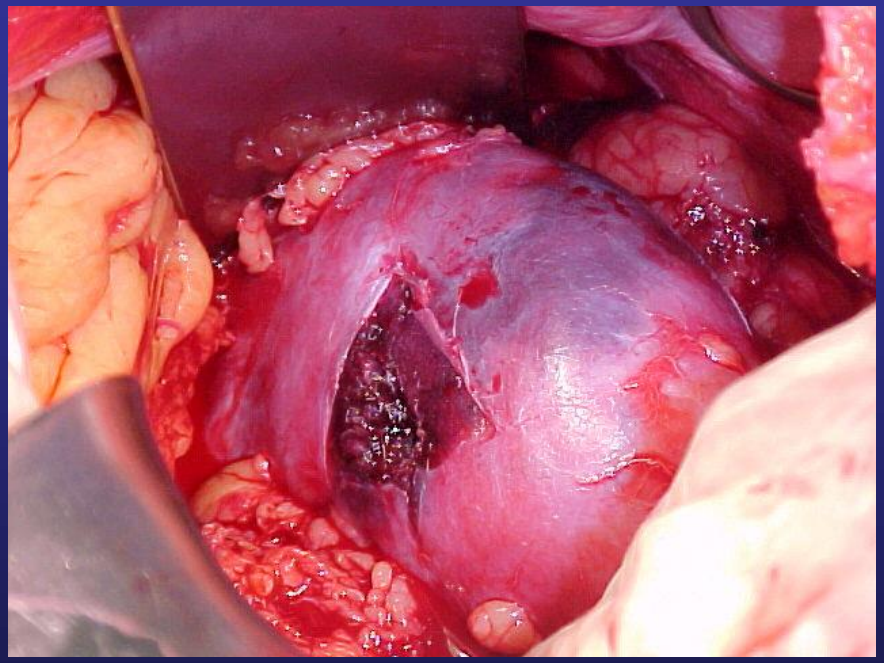
-in 3-4% pelvic fractures combined with bladder injury

-retroperitoneal perforation (80-90%) – treatment conservative possible

-intraperitoneal perforation (5-10%) – surgical treatment

-in 15% combined with urethral injury

-CT cystography (imaging of choice)



Thank you for your attention