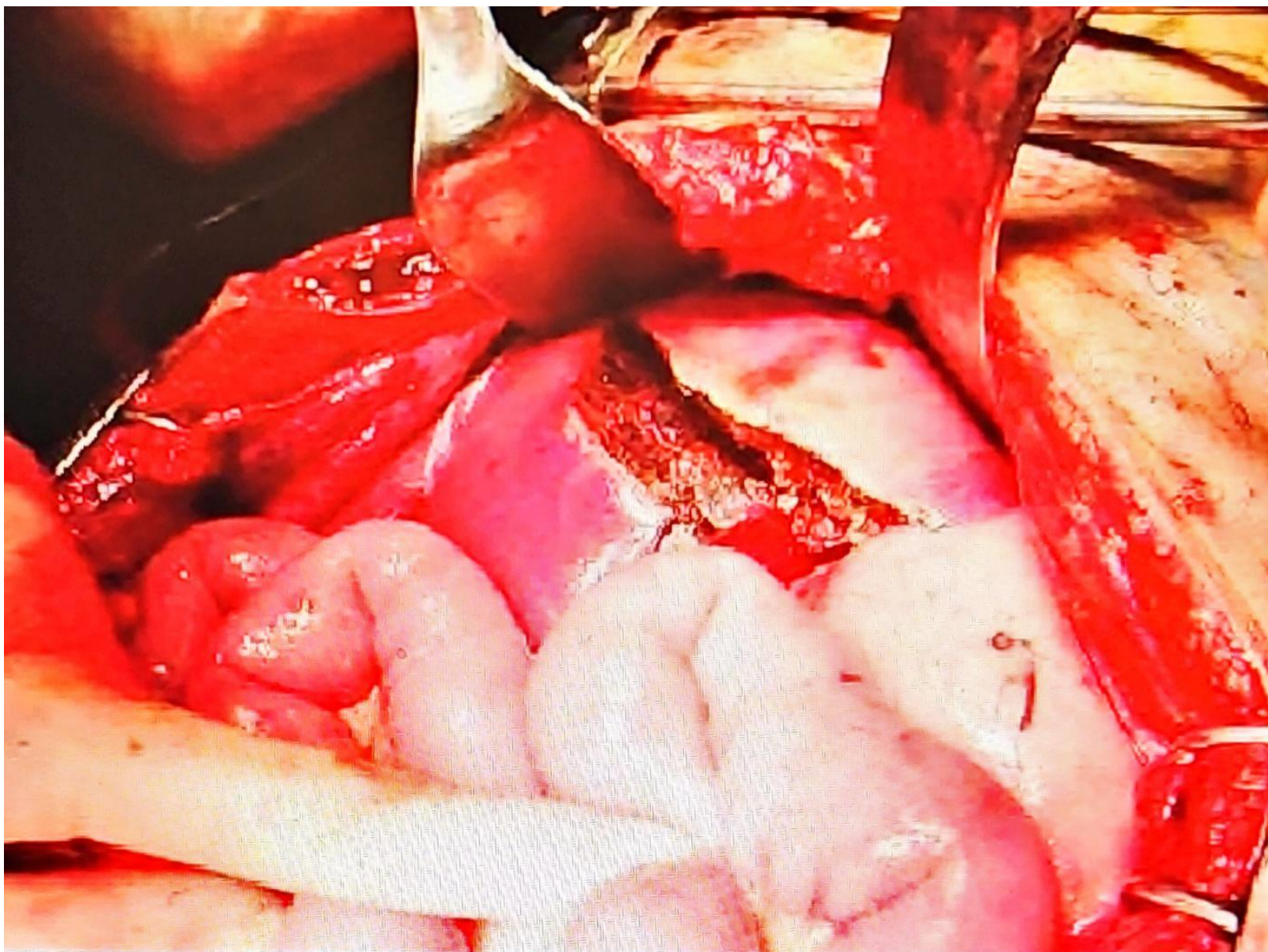


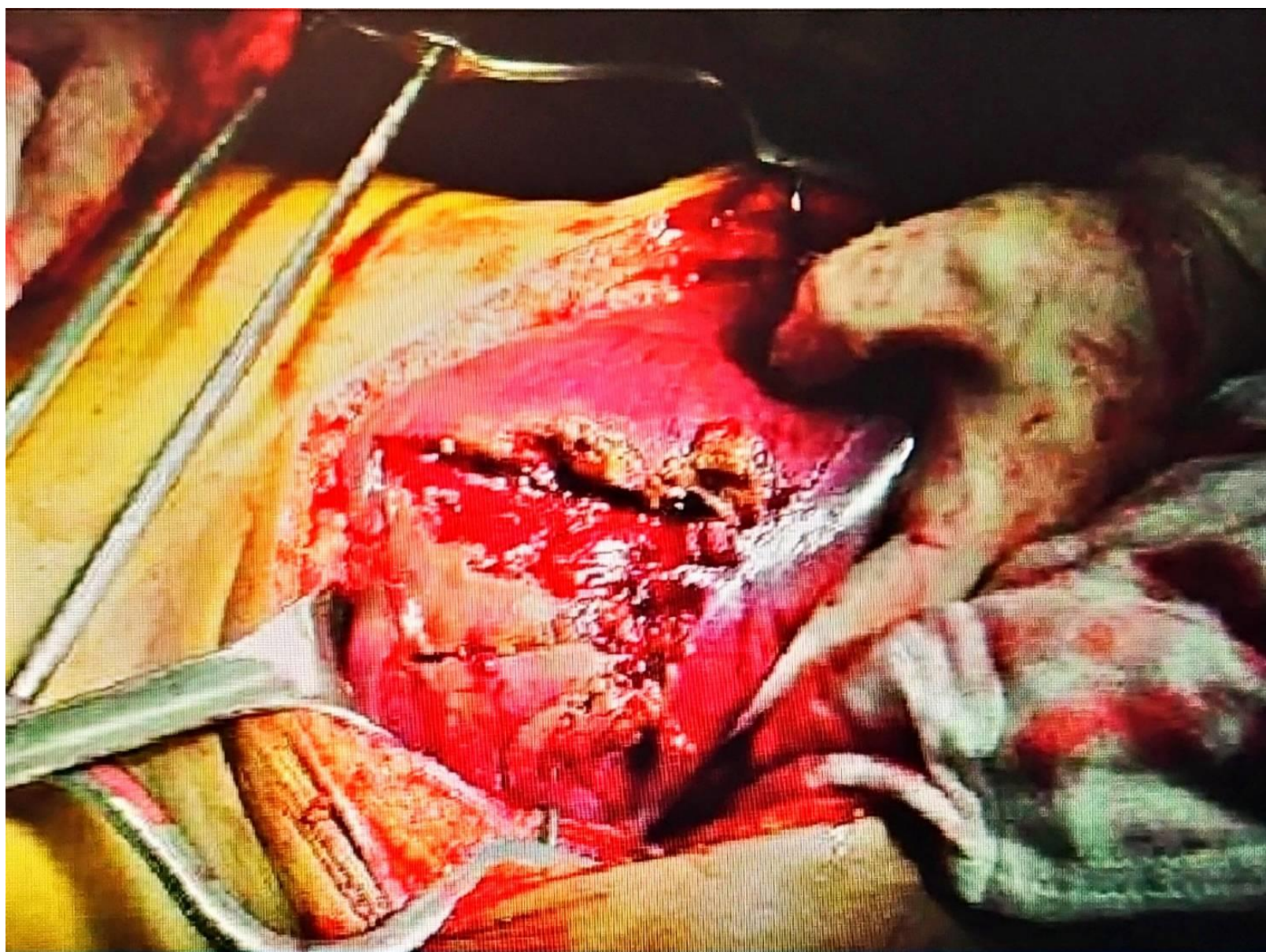
Non-Surgical Management of Liver Injury

ผศ.นพ.รัฐพลี ภาคอรรธ
ภาควิร่ากัฒศาสตร
จุฬาลงครรณมหาวิทยาลัย

Prometheus





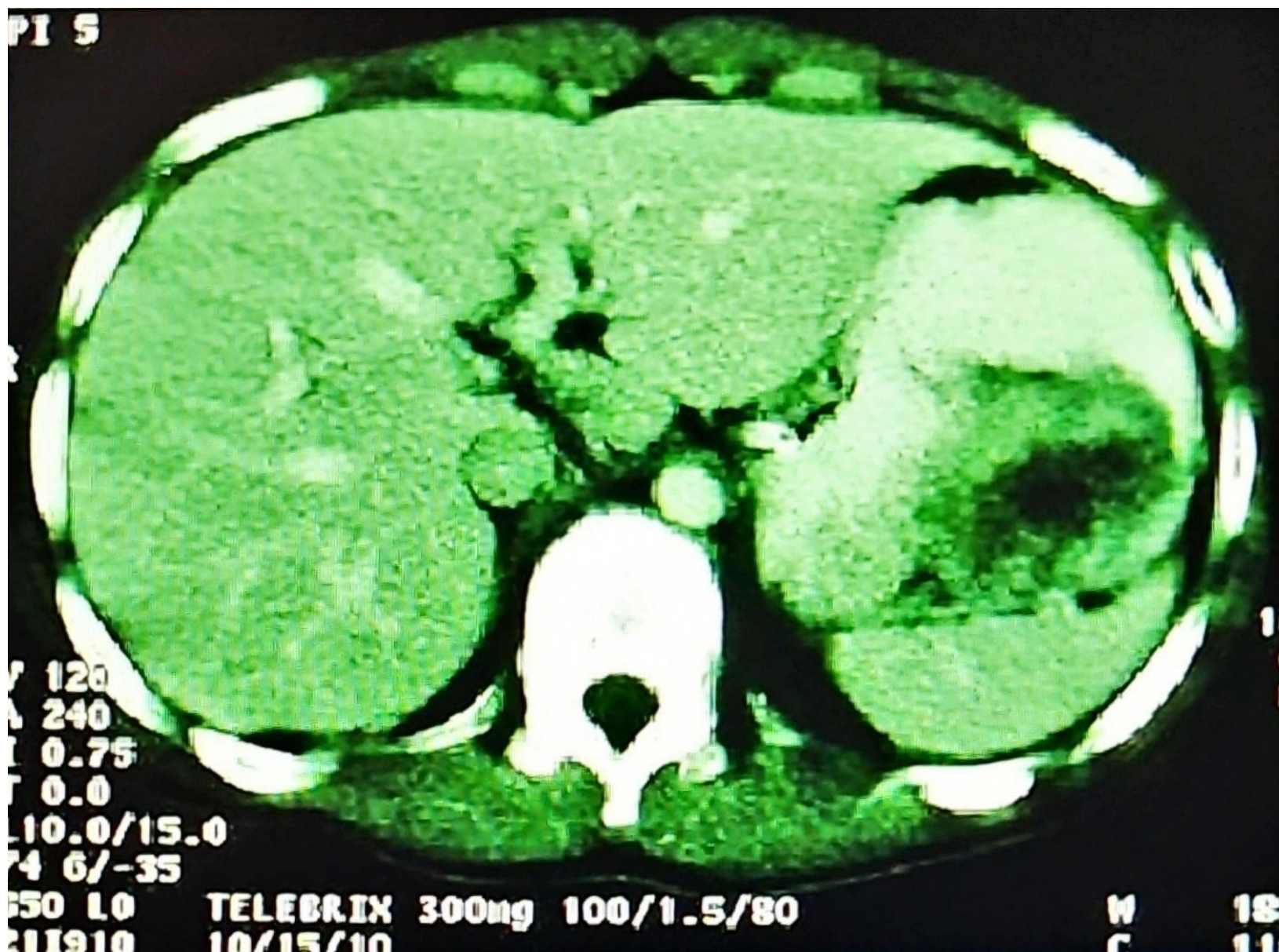


Investigations

- FAST
- DPL / DPA
- CT

CT scan

- Hemodynamically stable
- Helpful for non-operative management
- High sensitivity and specificity
- Identify other injuries
- Time consuming
- Contrast exposure



ART CHAIYACHAN M/43Y.

CHOLALONGKORN HOSP.

23165/44

SOMATOM PLUS 4

VE40D

27-FEB-2001

II-SP-CR

3:56:50.75

TP -340.5

SP1 6

L/U -1024/ 3071

Mean 1 59.4

SD 1 6.3

Area 1 0.14

E 1 67/ 76

Mean 2 63.2

SD 2 7.0

Area 2 0.08

E 2 52/ 78

Mean 3 66.8

SD 3 7.0

Area 3 0.14

E 3 64/ 111

MF 1.40

AV 120

MA 240

TI 0.75

CT 0.0

SL10.0/15.0

341 28/-35

ABSO LO

ULTRAVIST 100/1.5/80

N

148

Management

- Non-operative
- Operative

Operative management

- Unstable
- Peritonitis
- Massive hemoperitoneum
 - FAST
 - CT scan
 - DPL
- Failed conservative management

Non-operative management

Fear factors

- ?Bleeding and Laparotomy
- ?Bile leakage
- ?Missed intraabdominal injuries

Non-operative management

- Success 50-85%
 - Hemodynamically stable pts.
- Decreased
 - Abdominal infection
 - Transfusion
 - Hospital stay
- No increase in mortality

Success factors

- Hemodynamic stability
- Liver injury grading
- Amount of hemoperitoneum

**Status of nonoperative management
of blunt hepatic injuries in 1995:
a multicenter experience with 404 pts.**

Pachter Trauma. 1996 Jan;40(1):31-8.

■ Candidate	47%	
■ Mortality	0.4%	
■ Complications	5%	
■ Rebleeding	3.5%	
■ Required surgical intervention	0.7%	
■ Bilomas and perihepatic abscesses	1.2%	
■ Missed injuries	0.5%	
■ Success rate	98.5%	

**Nonoperative management of
liver injuries is safe and
effective regardless of the grade
of liver injury.**

Velmahos

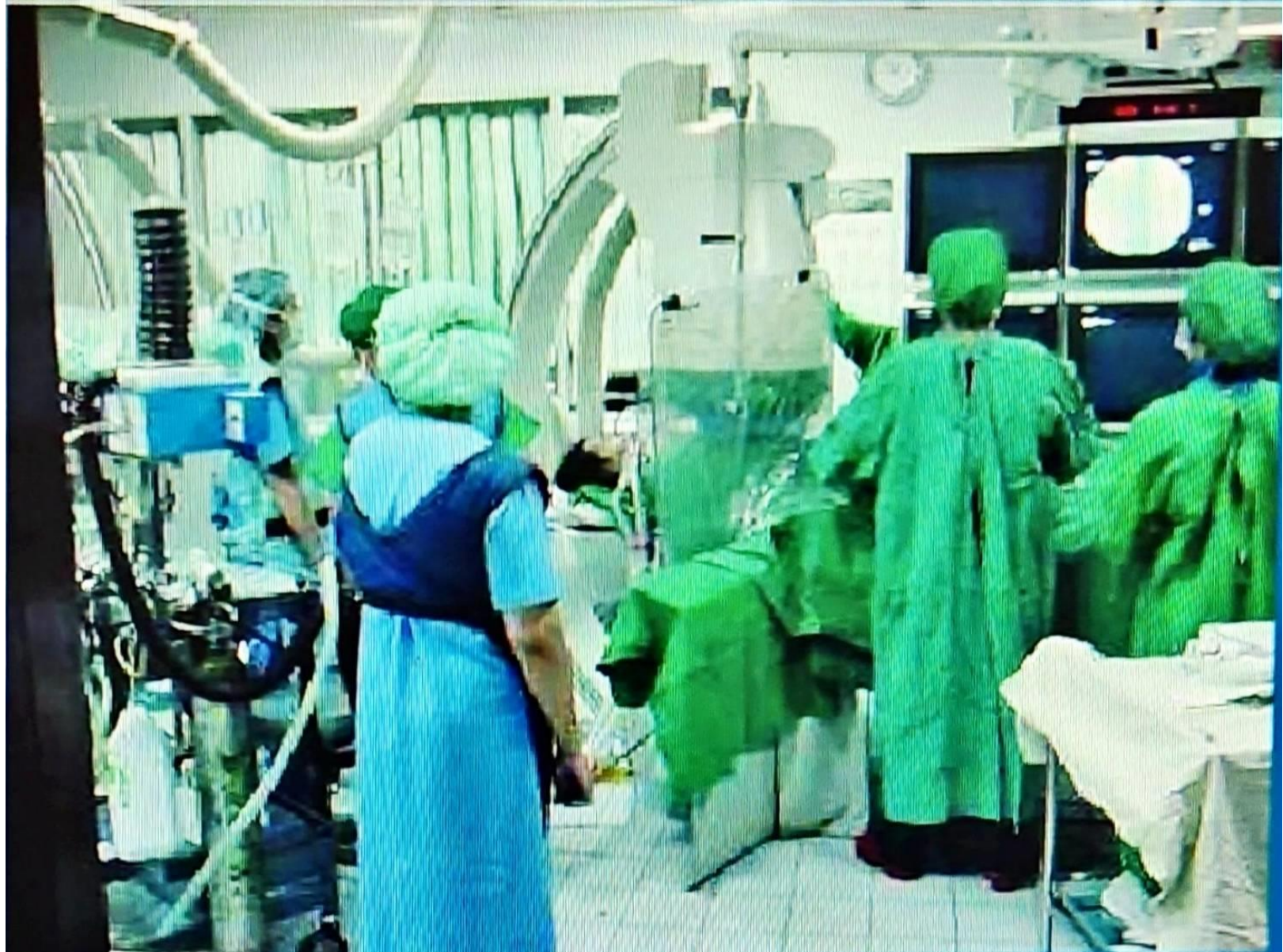
Arch Surg. 2003 May;138(5):475-80

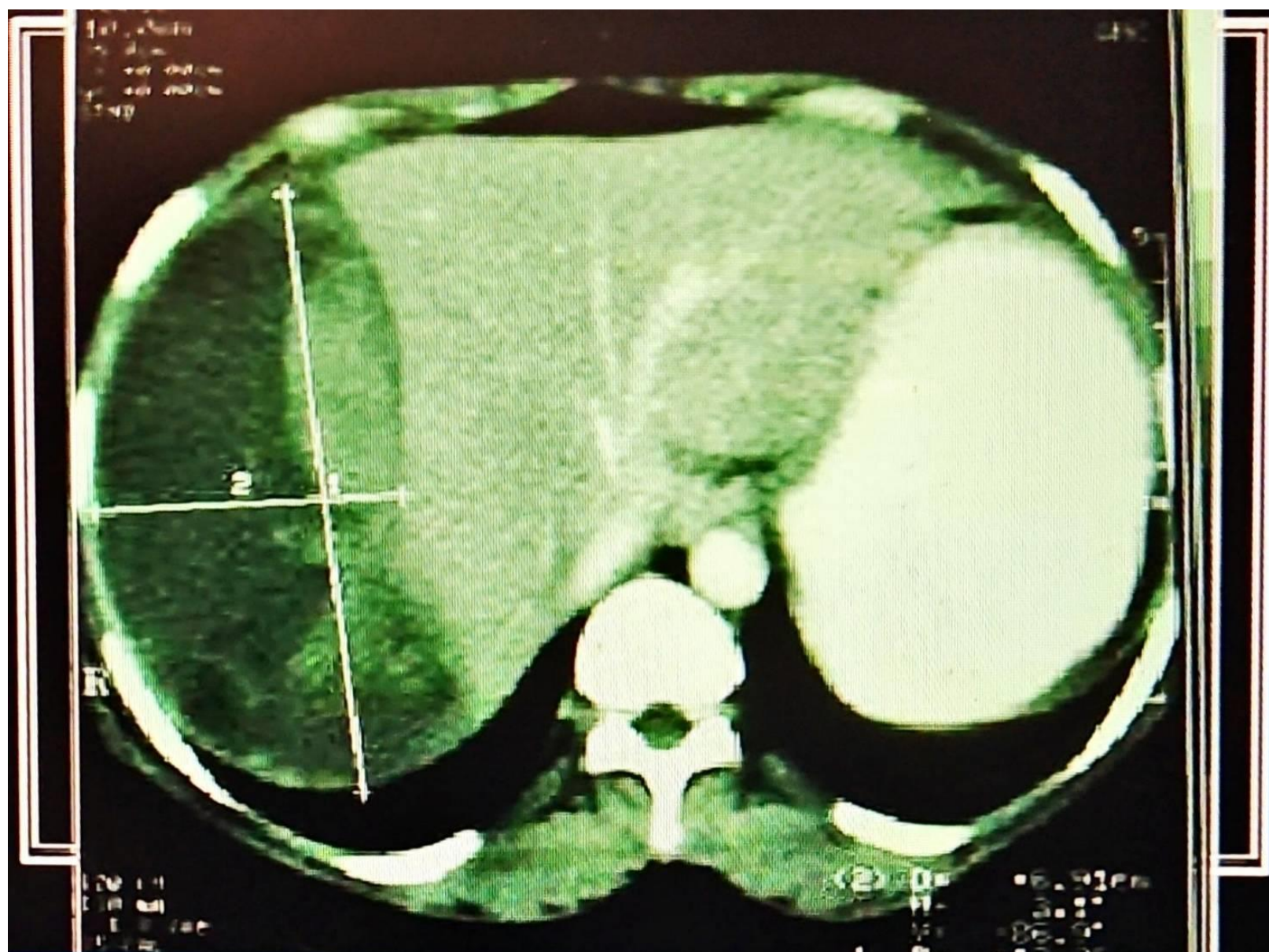
Failure of Nonoperative management

- Vital signs
- Peritonitis
- Blood transfusion > 4-6 u

Angiography +/- Embolization

- Contrast leakage
- False aneurysm
- High grade injury (IV-V from CT scan)
- Failed pack removal
- Hemobilia
- ? After packing





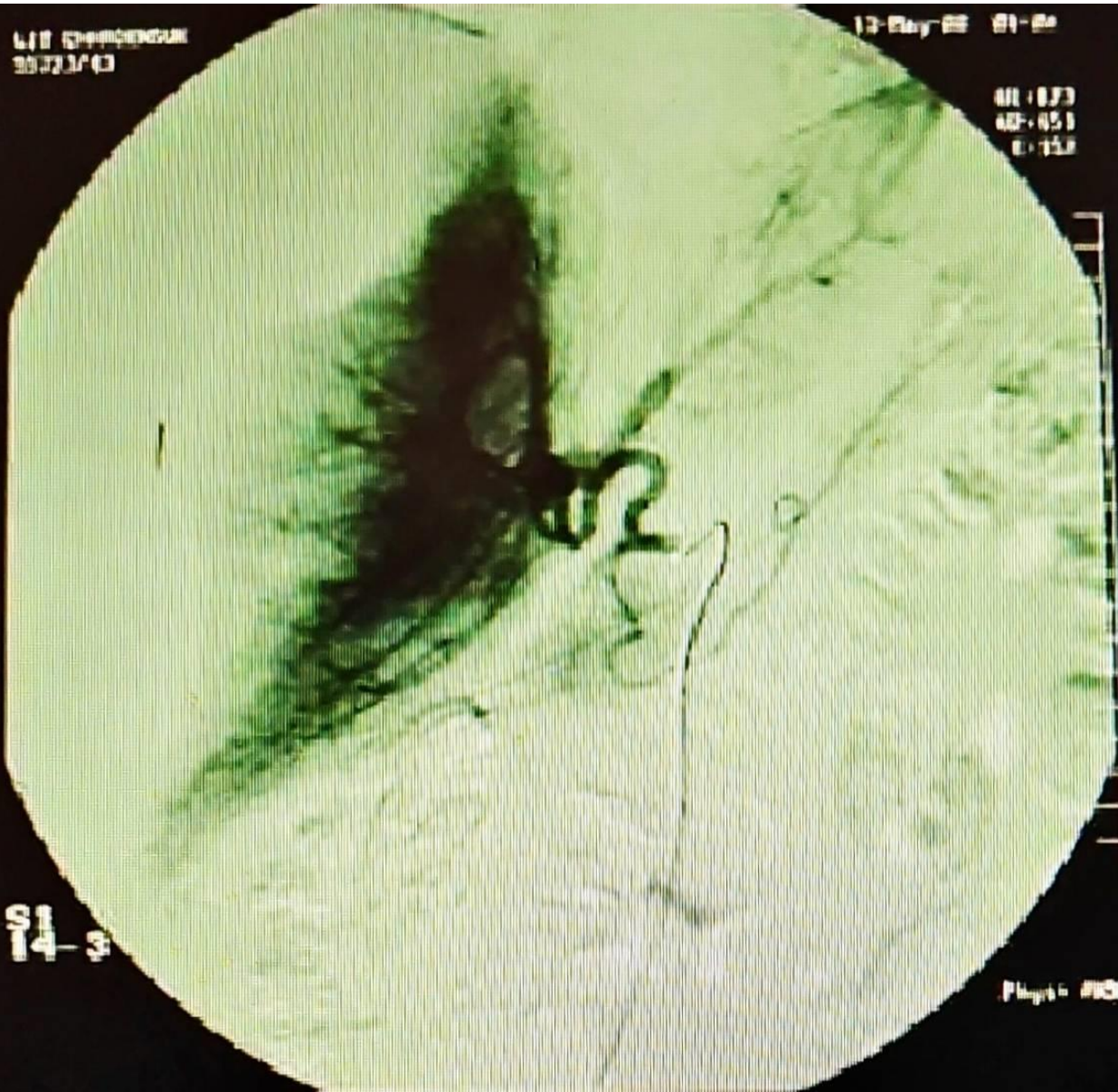
418 5-10-00
2007.11.03

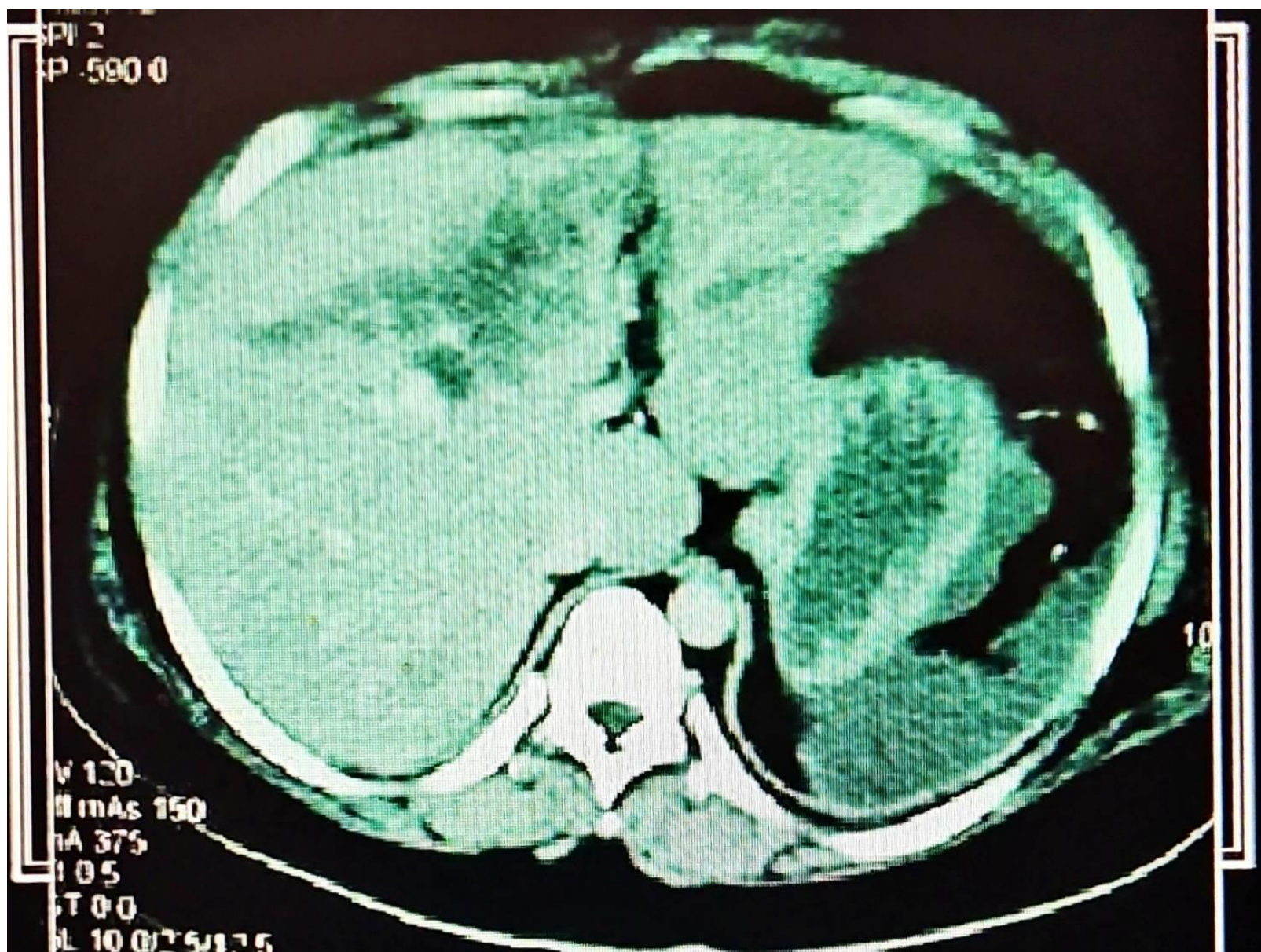
12-May-00 01-00

001:073
002:051
003:150

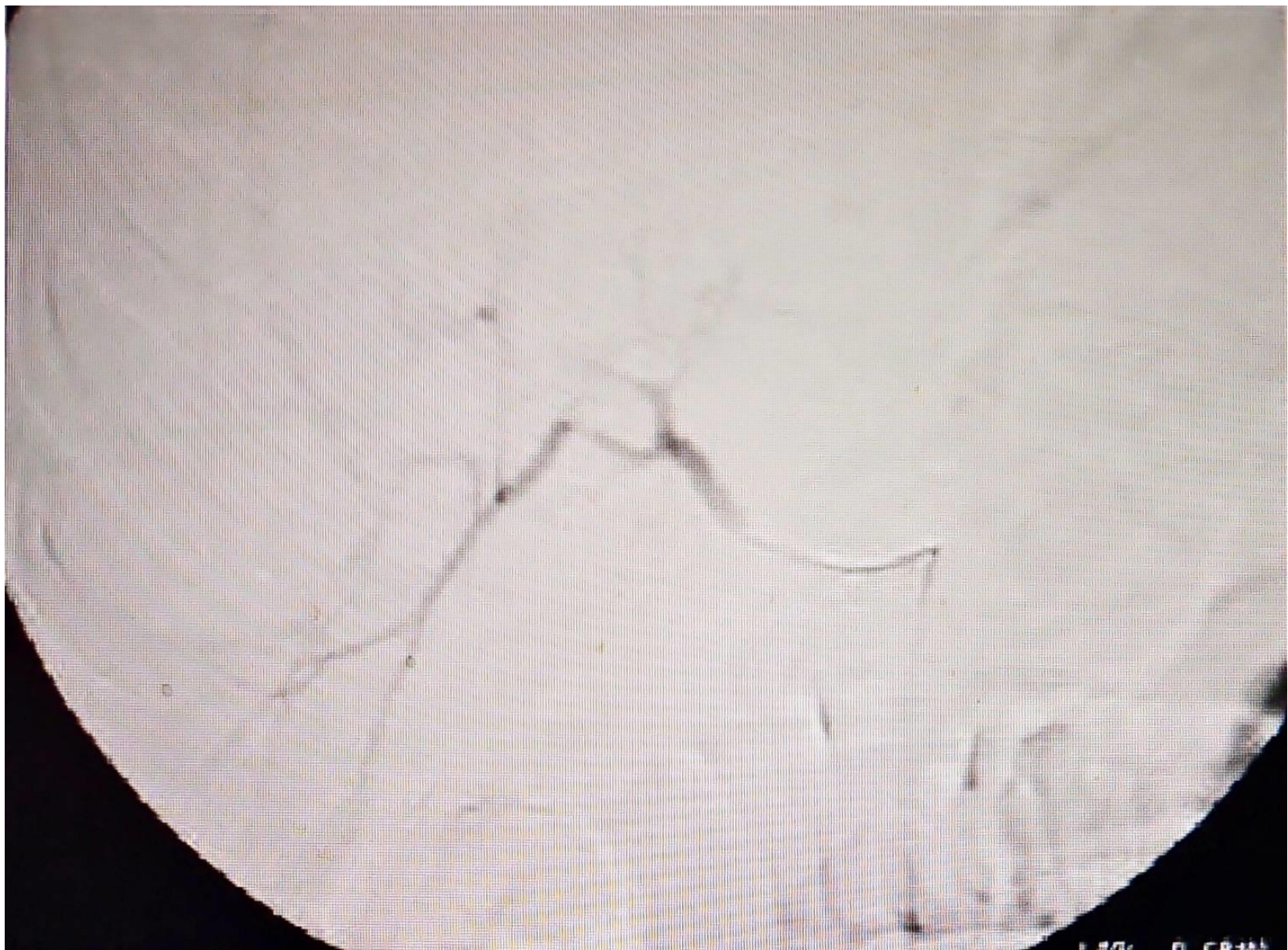
51-4

Play 1/100













ALUMINUM

105/16

10-1-54

10-1-54

10-1-54

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10-1-54

10-1-54

11-3

10-1-54

10-1-54



Failure for nonoperative management

spleen injury	34%
kidney injury	18%
liver	17%

Nonoperative treatment of blunt injury to solid abdominal organs: a prospective study.

Velmahos Arch Surg. 2003 Aug;138(8):844-51.

4 independent risk factors :
nonliver (splenic or renal) injury
positive FAST
amount of free fluid on CT of > 300 mL
need for blood transfusion

Nonoperative treatment of blunt injury to solid abdominal organs: a prospective study.

Velmahos Arch Surg. 2003 Aug;138(8):844-51.

Blunt trauma patients with concomitant injury to liver and spleen have higher Injury Severity Score, mortality, lengths of stay, and transfusion requirements

Multiplicity of solid organ injury: influence on management and outcomes after blunt abdominal trauma.

Malhotra J Trauma. 2003 May;54(5):925-9



**19.5%(17/87) were successfully
managed non-operatively**

**A multidisciplinary approach in the management
of hepatic injuries.**

**Sriussadaporn S, Pak-art R, Tharavej C,
Sirichindakul B, Chiamanantthapong S.**

Injury 2002 May;33(4):309-15

There was no difference in the nonoperative failure rate between patients with normal mental status and those with mild to moderate or severe head injuries.

Shapiro MB

Am Surg. 2001 Aug;67(8):793-6.

Non-operative management for penetrating liver injury

- Stable patients without peritonitis
- Fully conscious
- Frequent re-evaluation
- Gold standard: Laparotomy

Follow-up abdominal CT after non-operative management ?

**Follow-up abdominal CT scans
are not routinely necessary in
patients with liver injuries treated
nonoperatively**

Cuff RF

Am Surg. 2000 Apr;66(4):332-6.

Treatment of complication

Rebleeding

Angiogram

?CT

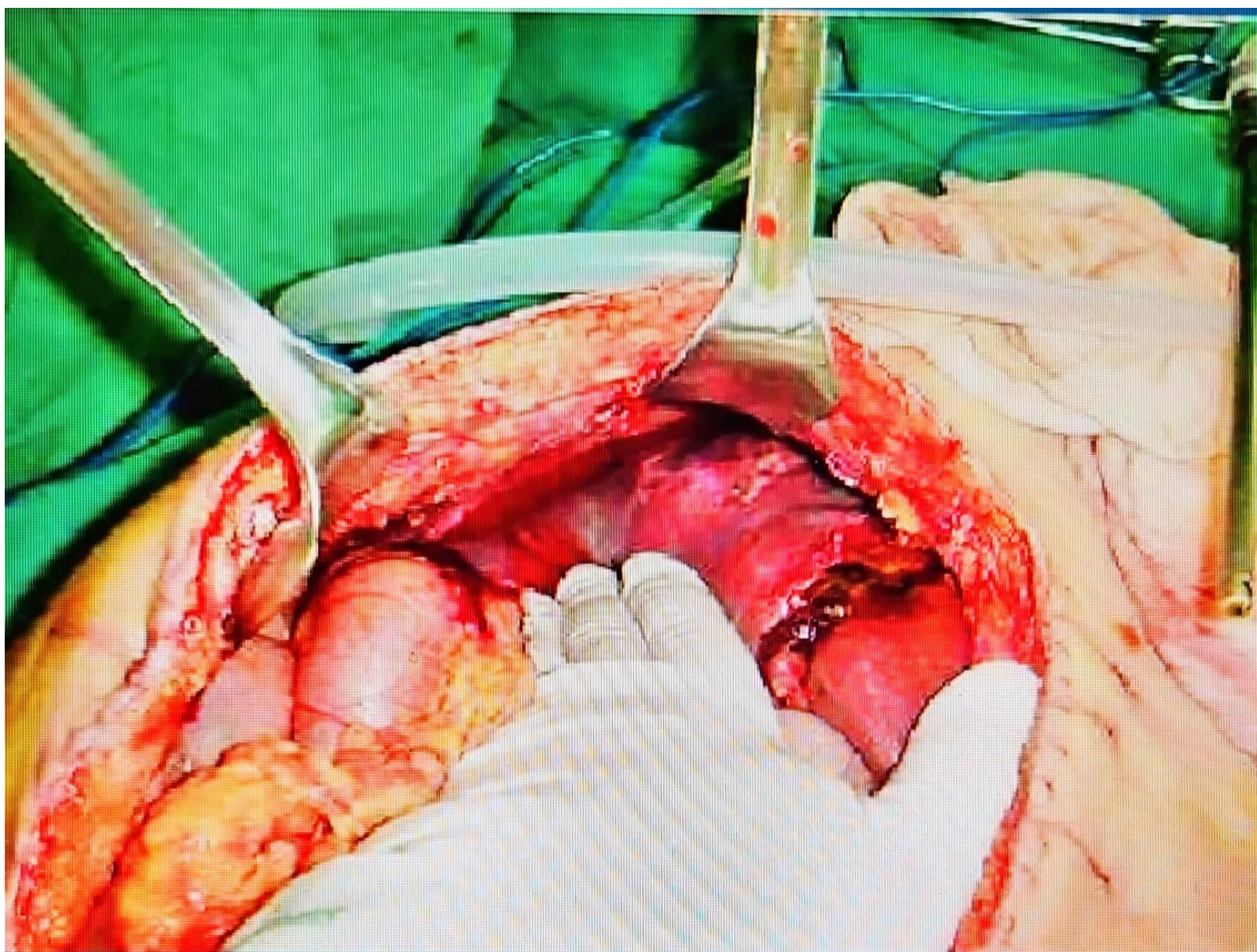
?OR

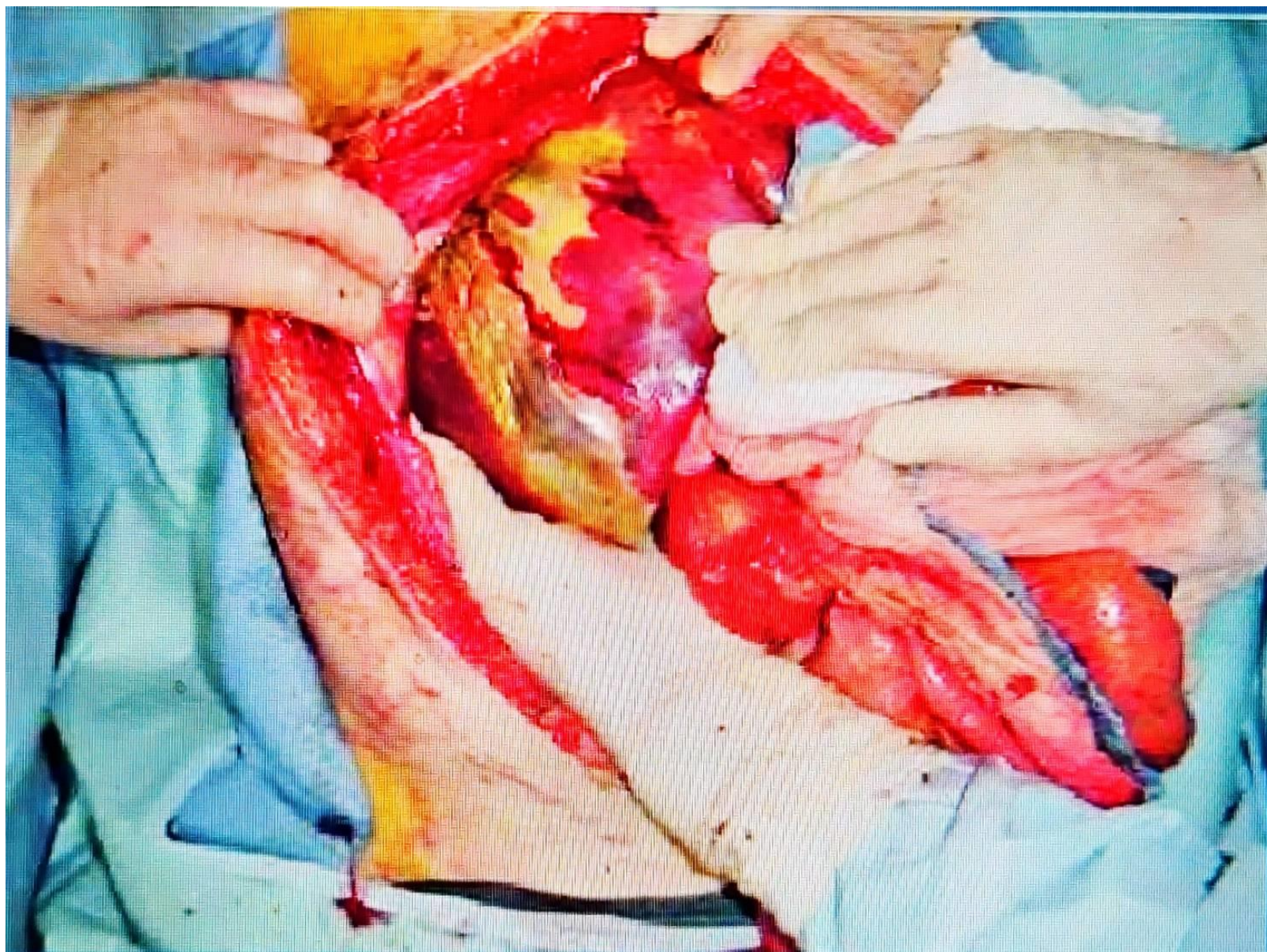
Bile leakage

- Supportive care
- Non-operative management
 - PCD
 - ERCP with stent

Liver necrosis

- Severe injury
- Post embolization
- High infection rate
- Rx: Non-anatomical resection



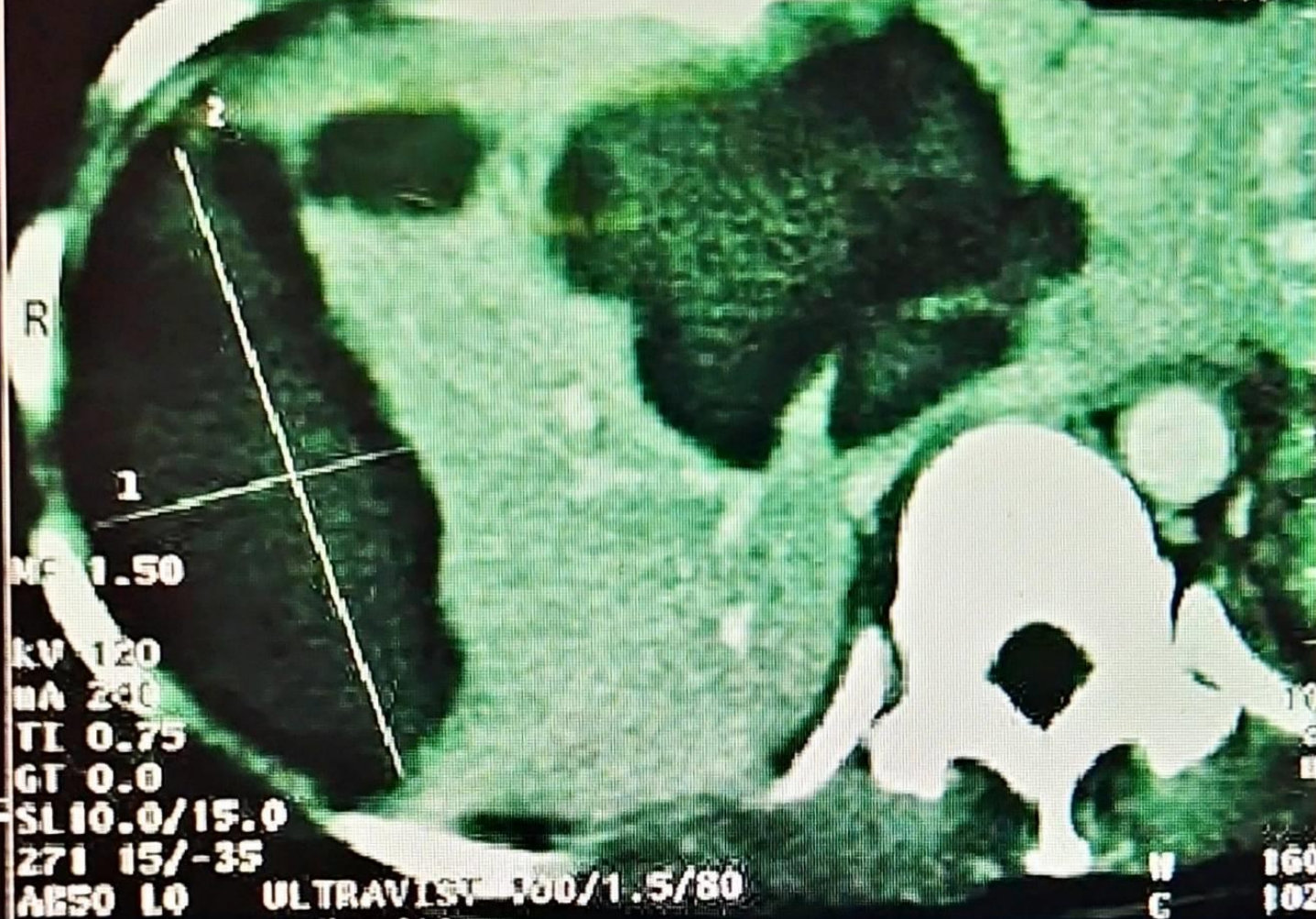


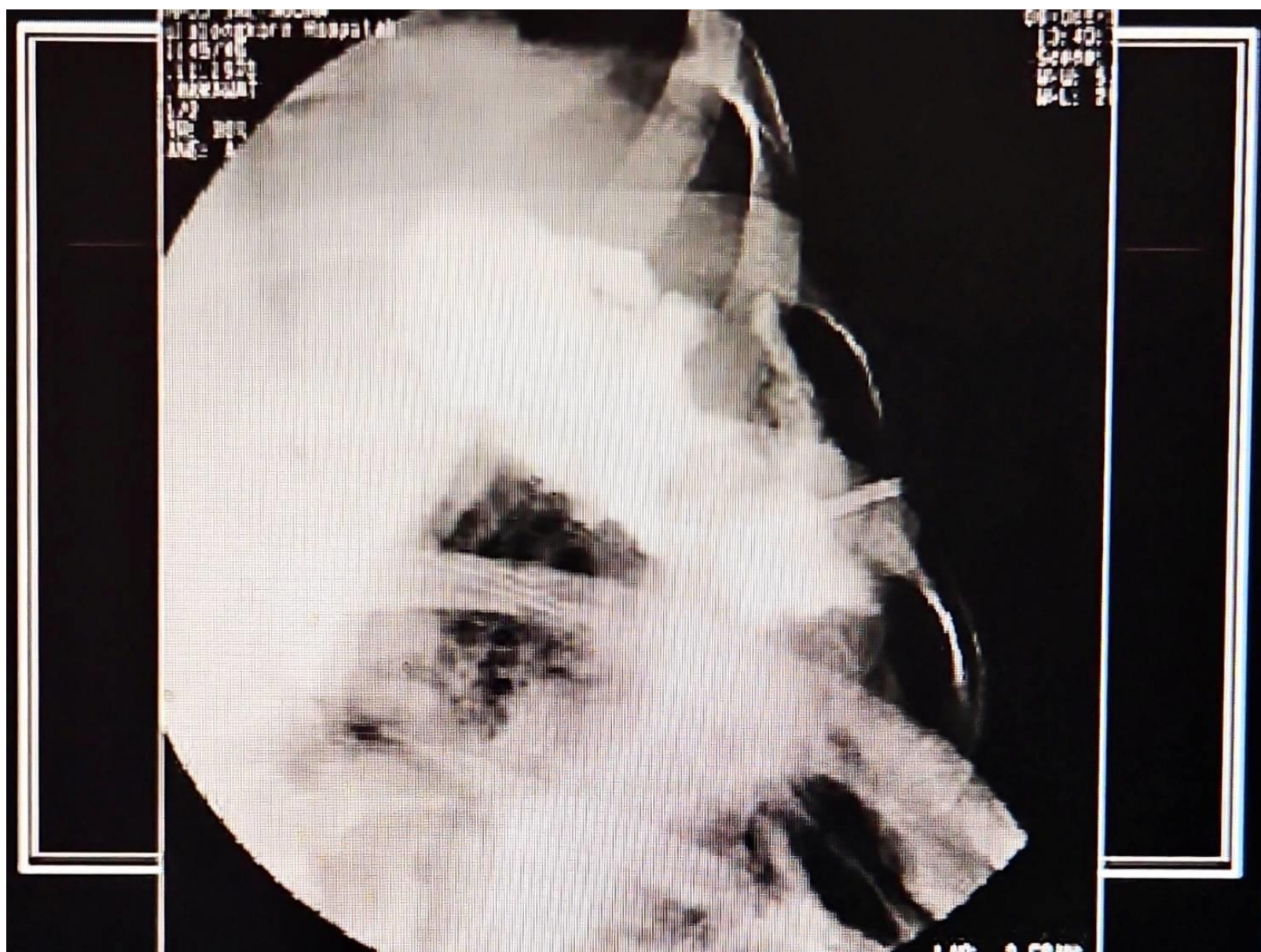
Percutaneous drainage

15:20:02.11
TP -304.0

SPI 4

Di 1 4.2
An 1 14
Di 2 8.0
An 2 109

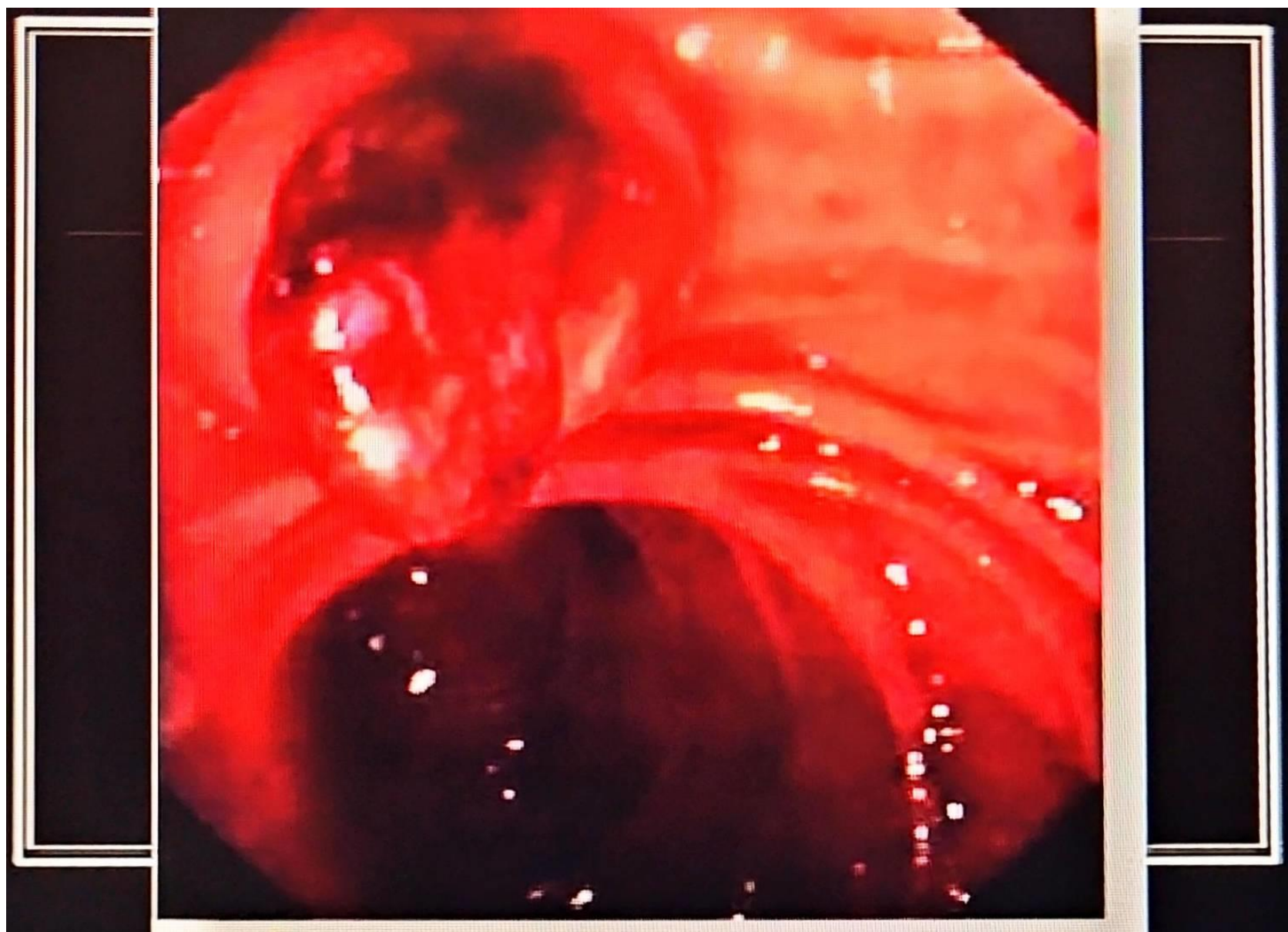


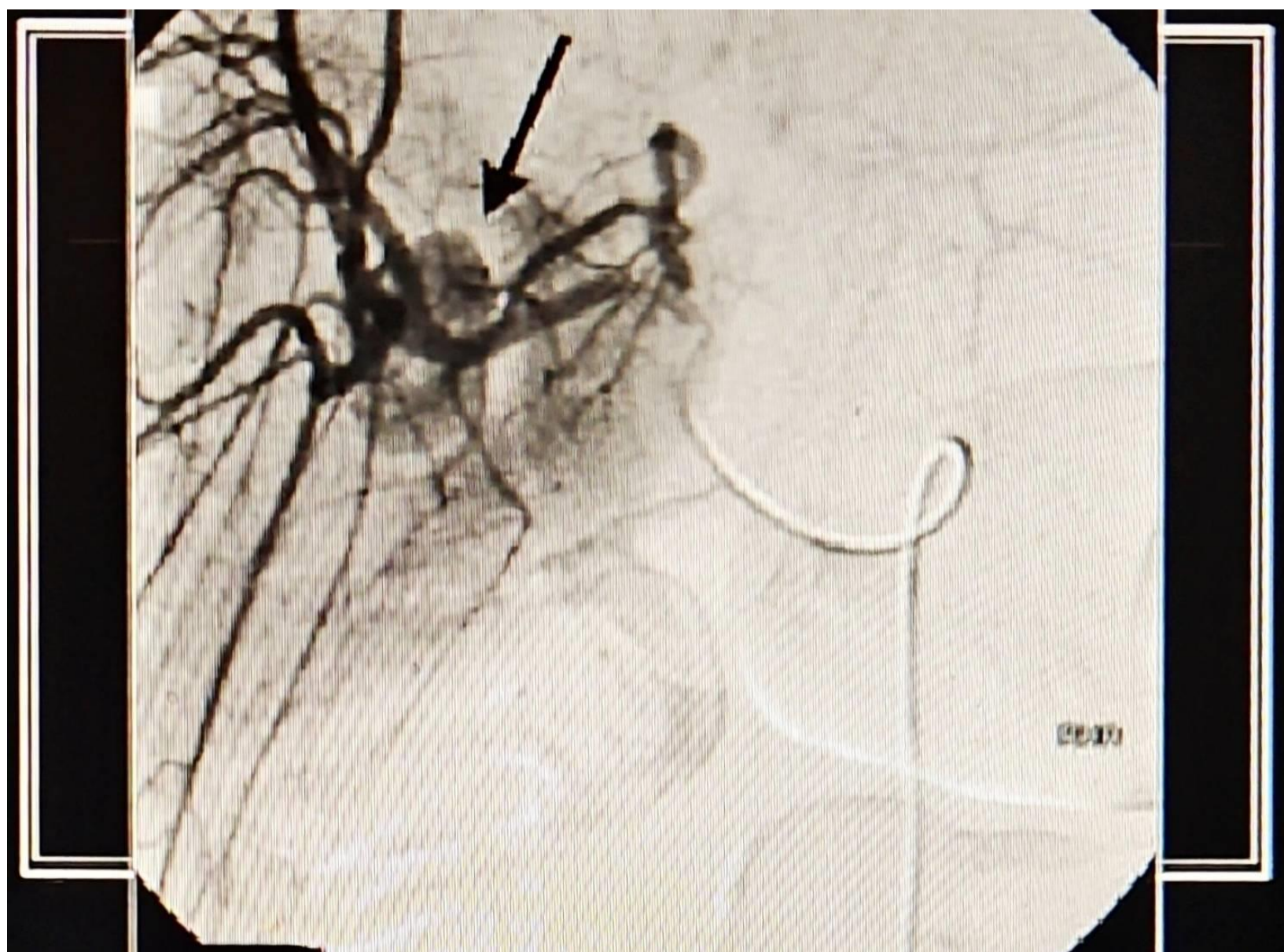




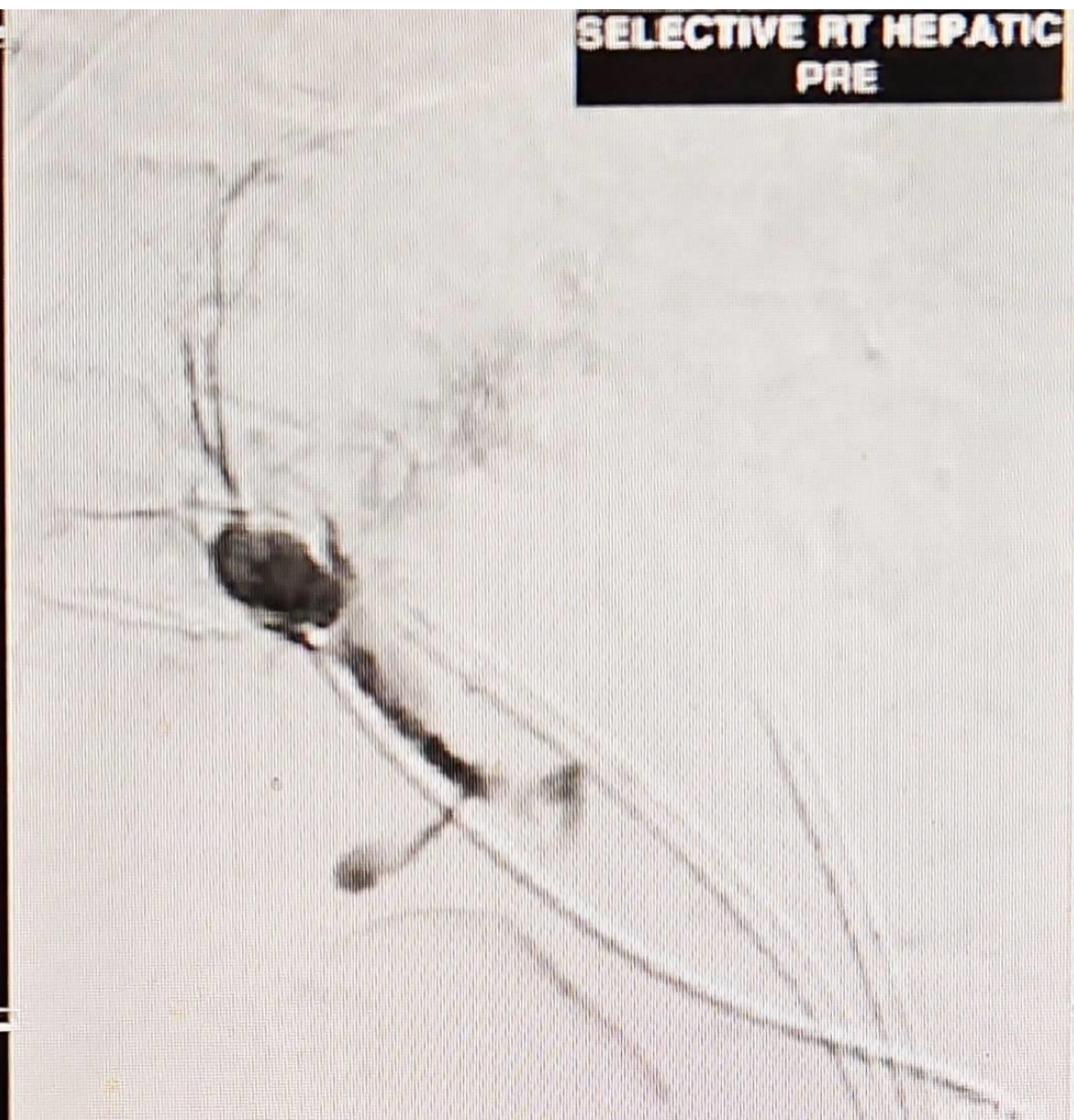
Hemobilia

- After blunt or penetrating liver injury
- Classic triad
 - Colicky pain
 - Jaundice
 - Upper GI bleeding
- Dx: Angiography
- Rx: Embolization





**SELECTIVE RT HEPATIC
PRE**



Bilhemia

- Bile duct : Hepatic v.
- High mortality
- Jaundice with elevated liver enzyme
- Dx: ERCP
- Rx: Endoscopic management



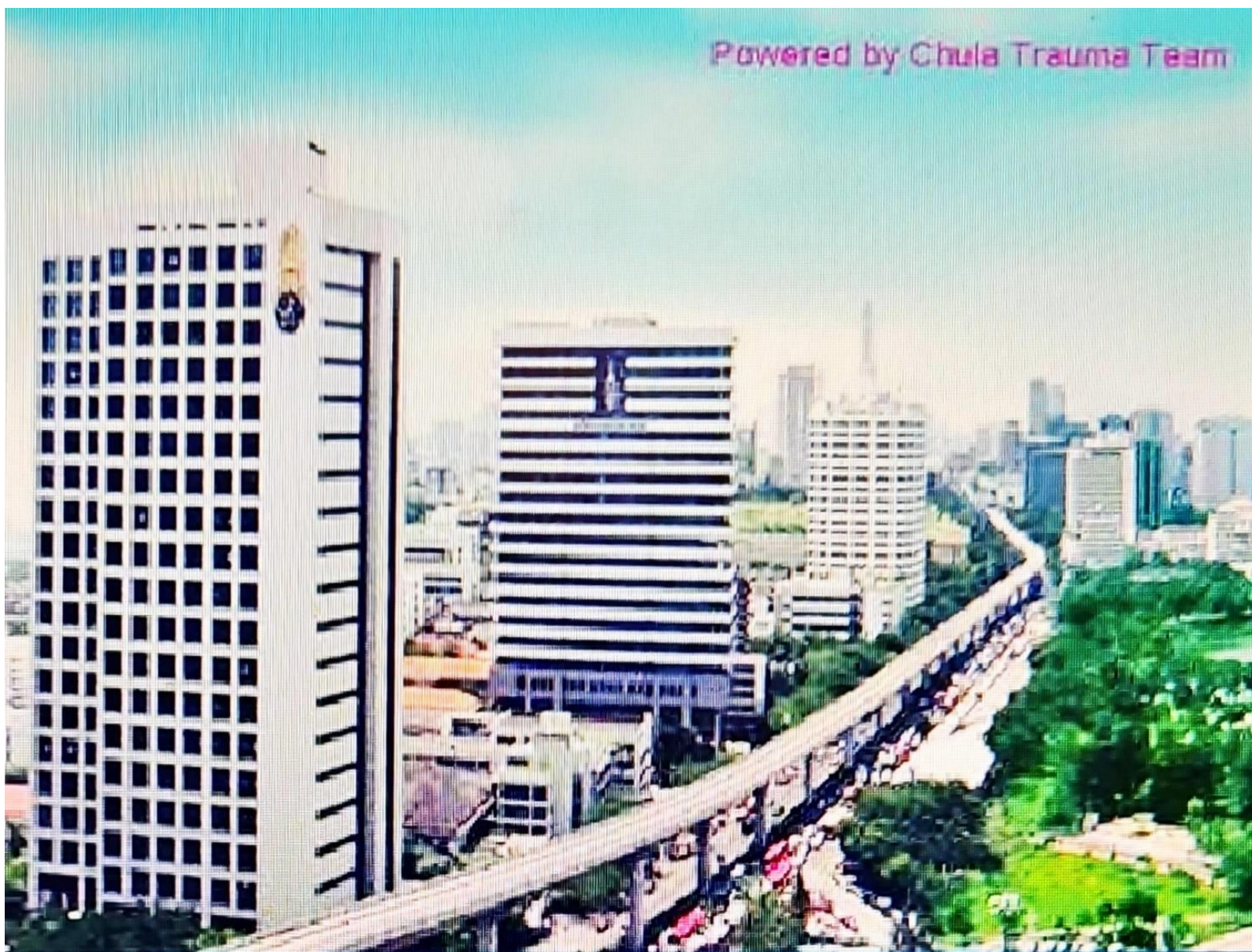
Future

- Recombinant activated factor VII
- Genome
- Modern equipment
- Minimally invasive surgery

Conclusion

- Non-operative management of liver injuries is the treatment of choice in hemodynamically stable patients.
- Grade of injury / degree of hemoperitoneum is not a major factor.

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Rattaplee.P@Chula.ac.th