

Das Polytrauma Behandlung nach dem diagnostischen und therapeutischen Stufenplan

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Definition

Gleichzeitig entstandene Verletzung mehrerer Körperregionen oder Organsysteme, wobei wenigstens eine Verletzung oder die Kombination mehrerer Verletzungen lebensbedrohlich ist.



- **Standardisierte Diagnostik**
- **Erstversorgung**
- **Entscheidung über Priorität bei Therapie**



Therapeutischer und diagnostischer Stufenplan

diagnostische Stufen

- Stufe I Lebensrettende Sofortmaßnahmen
- Stufe II Stabilisierungsphase,
Diagnostikphase I
- Stufe IV Intensivmedizin,
Diagnostikphase II



Therapeutischer und diagnostischer Stufenplan

operative Stufen

- Stufe IA (lebensrettende Sofortmaßnahmen)
innerhalb von Minuten
- Stufe III (dringende Frühoperationen)
innerhalb Stunden
- Stufe V (elektive Spätoperationen)
innerhalb Tagen



A **Atemwege**

freimachen – Kopf überstrecken
Zungengrund!

B **Beatmung**

Mund zu Mund oder Mund zu Nase

C **Zirkulation**

Äußere Herzmassage

Beatmung : Massage = 2 : 4



$$\text{Schockindex} = \frac{\text{Puls}}{\text{Blutdruck}}$$

Normbereich = 0,5

Blutvolumenverlust bis 30% = 1,0
ab 1,5 Lebensgefahr!



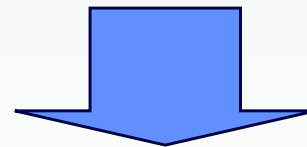
Erstuntersuchung

**klin.
Untersuchung**

Sono Abdomen

Röntgen Thorax

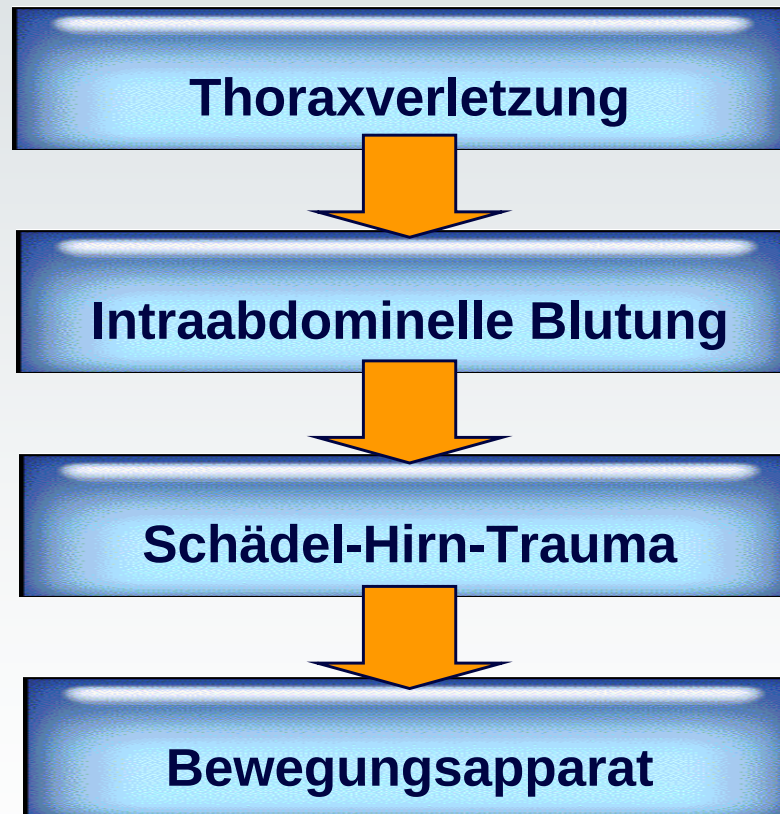
**Oxygenierung?
Lungenverletzung?
intraabdominelle Blutung?**



Weiteres Vorgehen nach Befund



Hierarchie der Versorgung verletzter Organsysteme



Blutuntersuchung

- Hb
 - Hämatokrit
 - Elektrolyte (Na, K, Amylas, BZ, Krea)
 - Gerinnung (Quick, PTT, TZ)
 - Blutgruppe

 - Blutgasanalyse
 - engmaschige Kontrolle der Laborparameter
- ➡ **initiale Volumenverschiebung**



Optimalparameter nach Stabilisierung

● RR	100 mmHg
● Puls	100 / min
● ZVD	10 cm H ² O
● PaO ²	70 mmHg
● SaO ²	90%
● Urinausscheidung	25 ml / 15 min
● Hb	10 g/dl
● Quick	70%
● PTT	40 Sek
● Thrombozyten	100.000

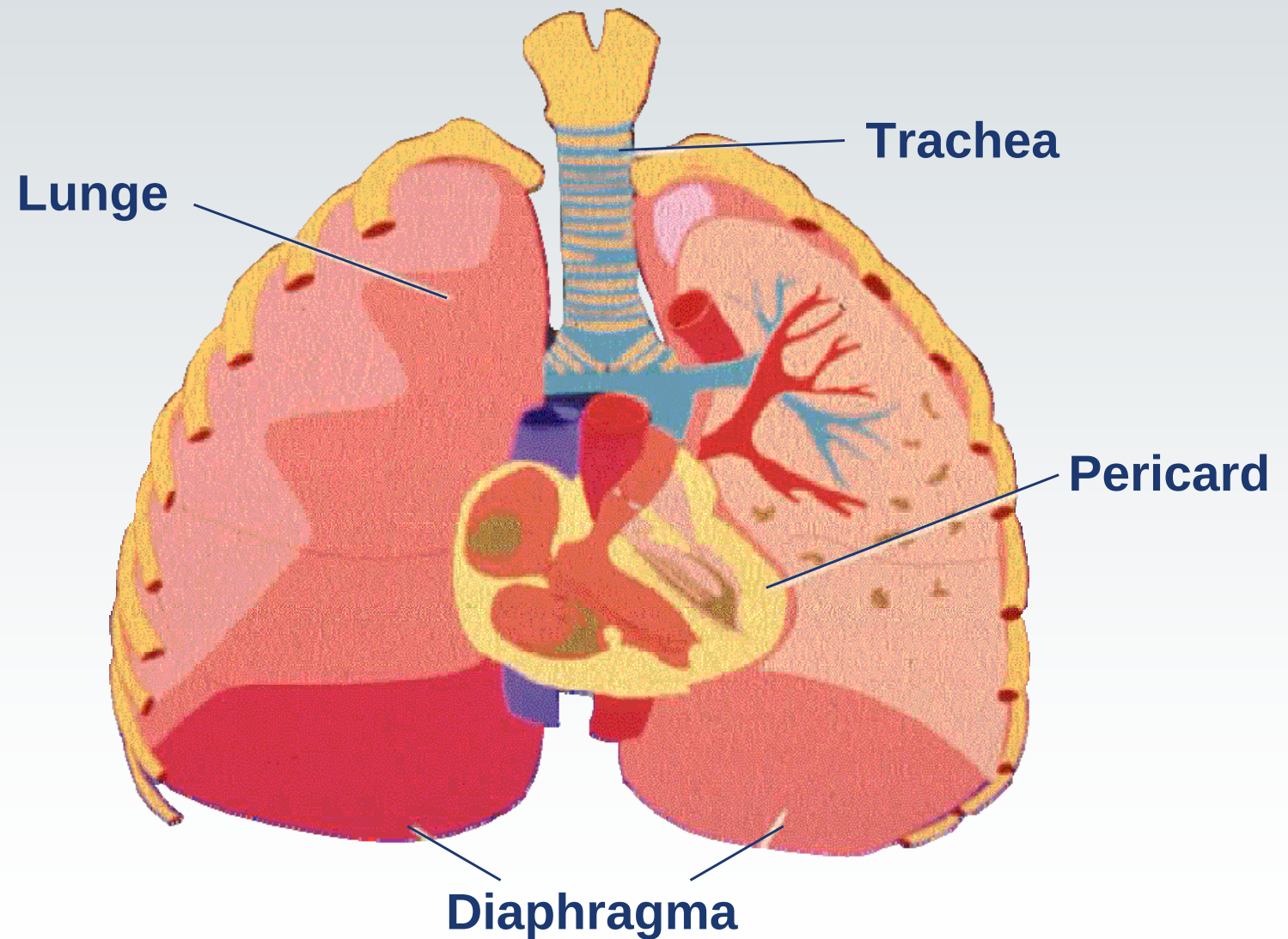


Obligate Röntgendiagnostik bei Polytrauma

- **Thorax**
- **Becken**
- **Schädel in 2 Ebenen**
- **HWS in 2 Ebenen**
- **Dens spezial**
- **BWS in 2 Ebenen**
- **LWS in 2 Ebenen**



Thoraxverletzungen



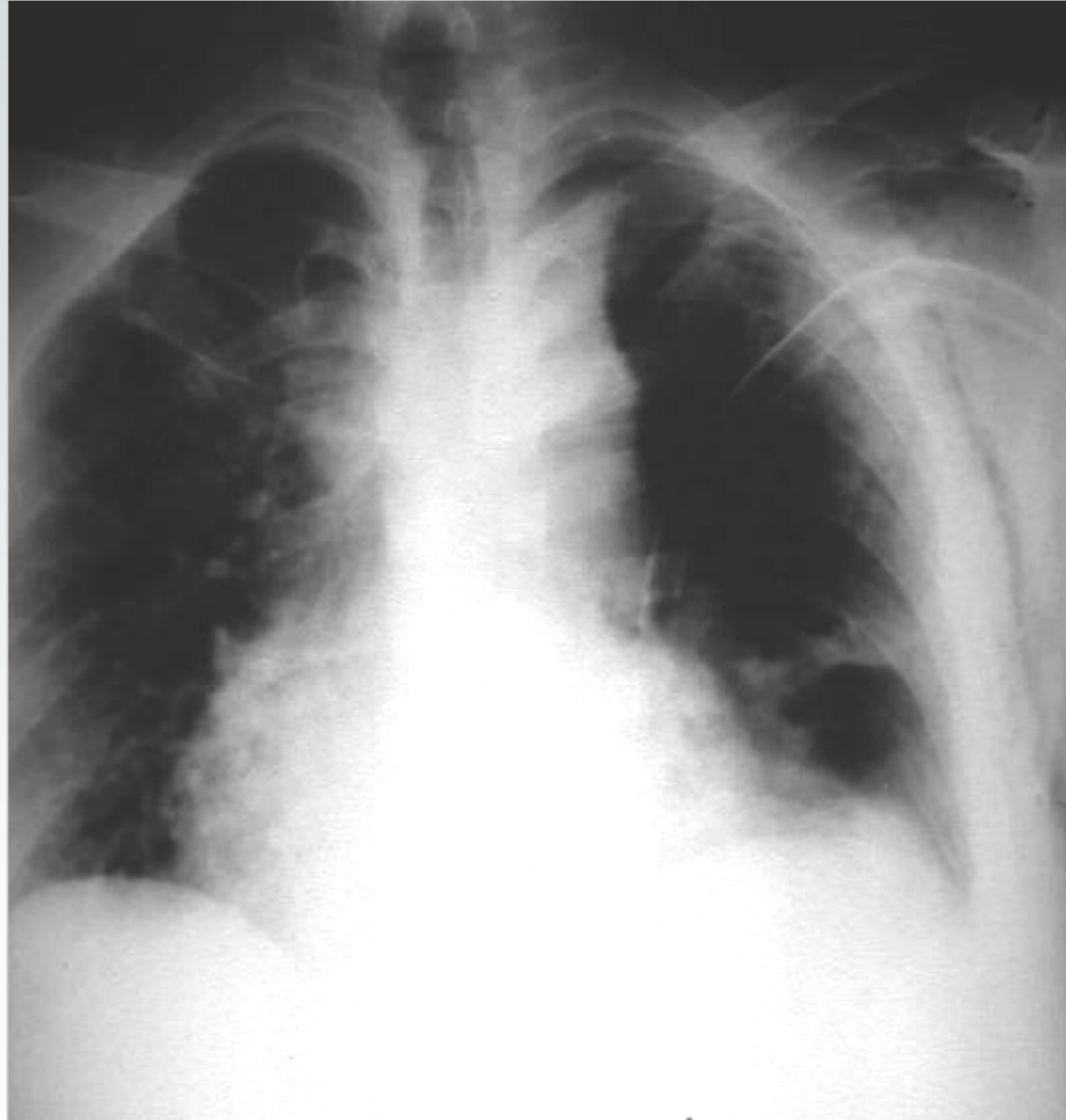
Polytrauma



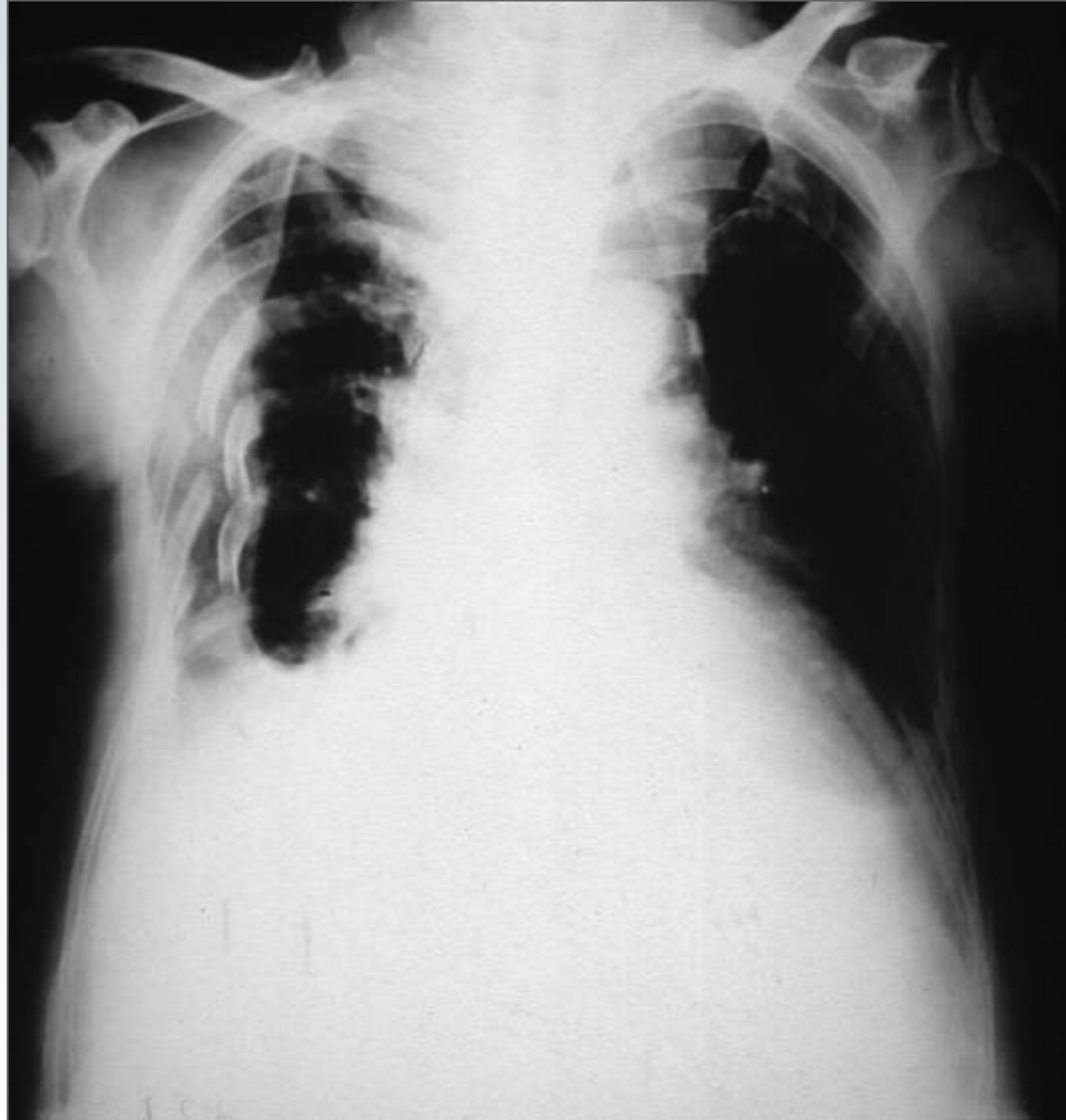
I. Schneider 29.06.04











Stumpfes Thoraxtrauma: 10 Fragen

- Hypovolämie ?
 - Respiratorische Insuffizienz ?
 - Spannungspneumothorax ?
 - Herztamponade ?
-
- Rippen-Serienfrakturen ? (paradoxe Atmung?)
 - Pneumothorax ? (Haut-, Mediastinal-Emphysem?)
 - Haematothorax ?
 - Zwerchfellruptur ?
 - Aortenruptur ?
 - Contusio Cordis ?

**Unmittelbar
Lebensbedrohlich !
Diagnose und Therapie
vor Röntgenbild !**



Lebens- und organerhaltende Frühoperationen

● Schädel

- Epi- und subdurale Blutungen
- perforierende Augenverletzungen

● Thorax

- anhaltende intrapleurale Blutungen >200 ml/h
- akute Herzbeuteltamponade
- dissezierende Aortenruptur
- Bronchusabriß

● Abdomen

- Intraabdominelle Blutungen
- Hohlorganruptur



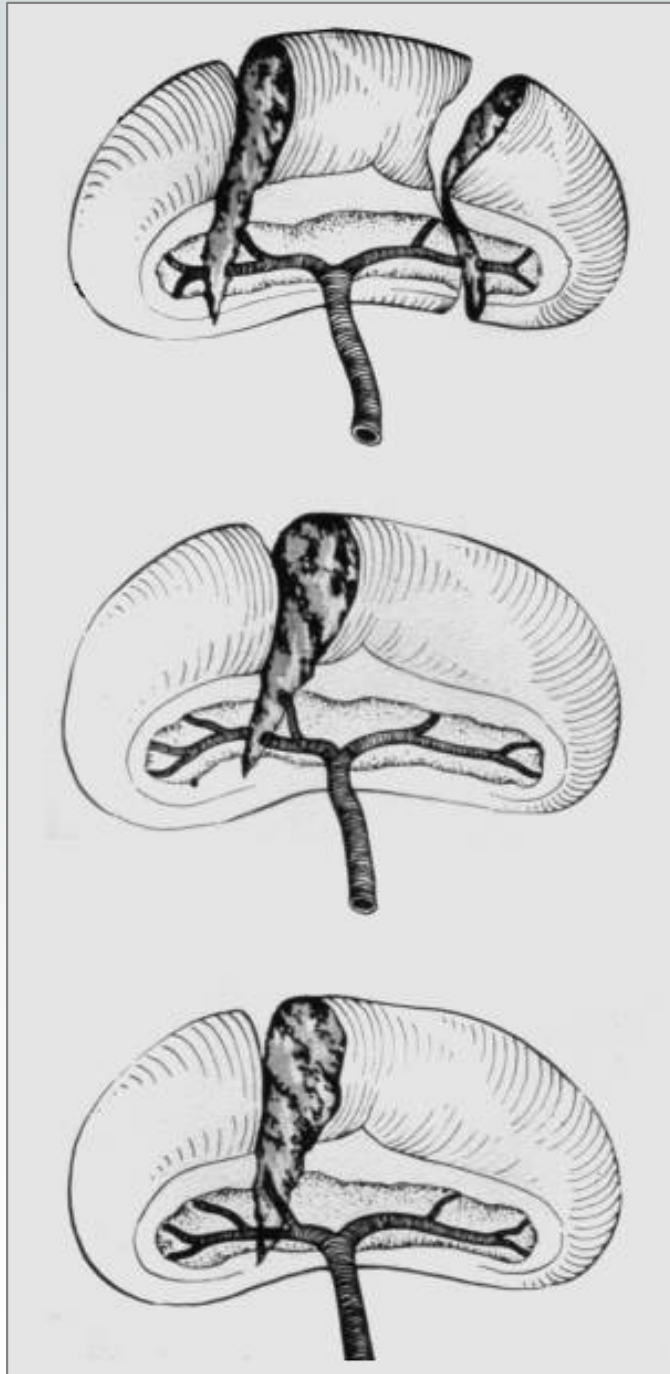


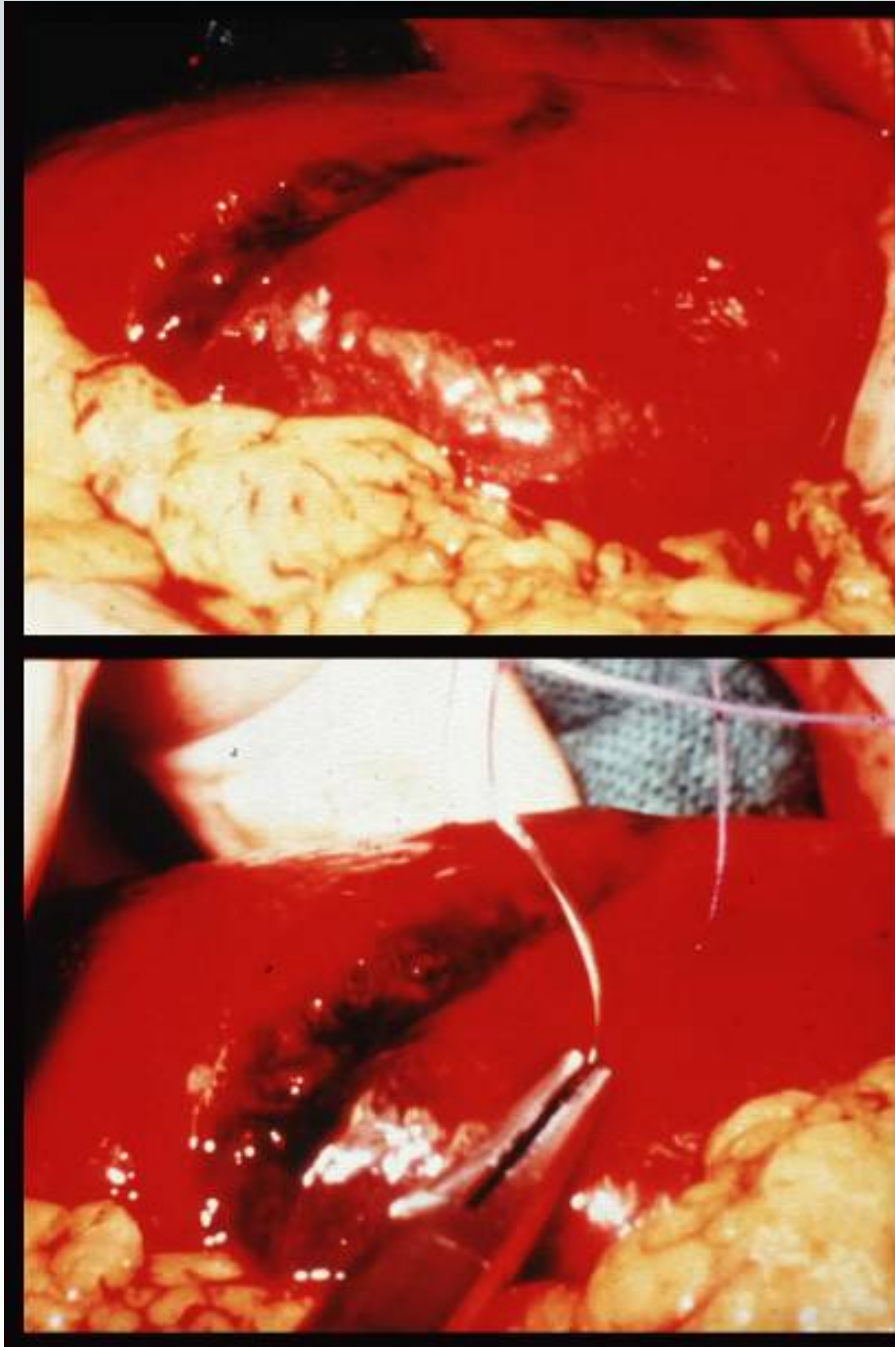


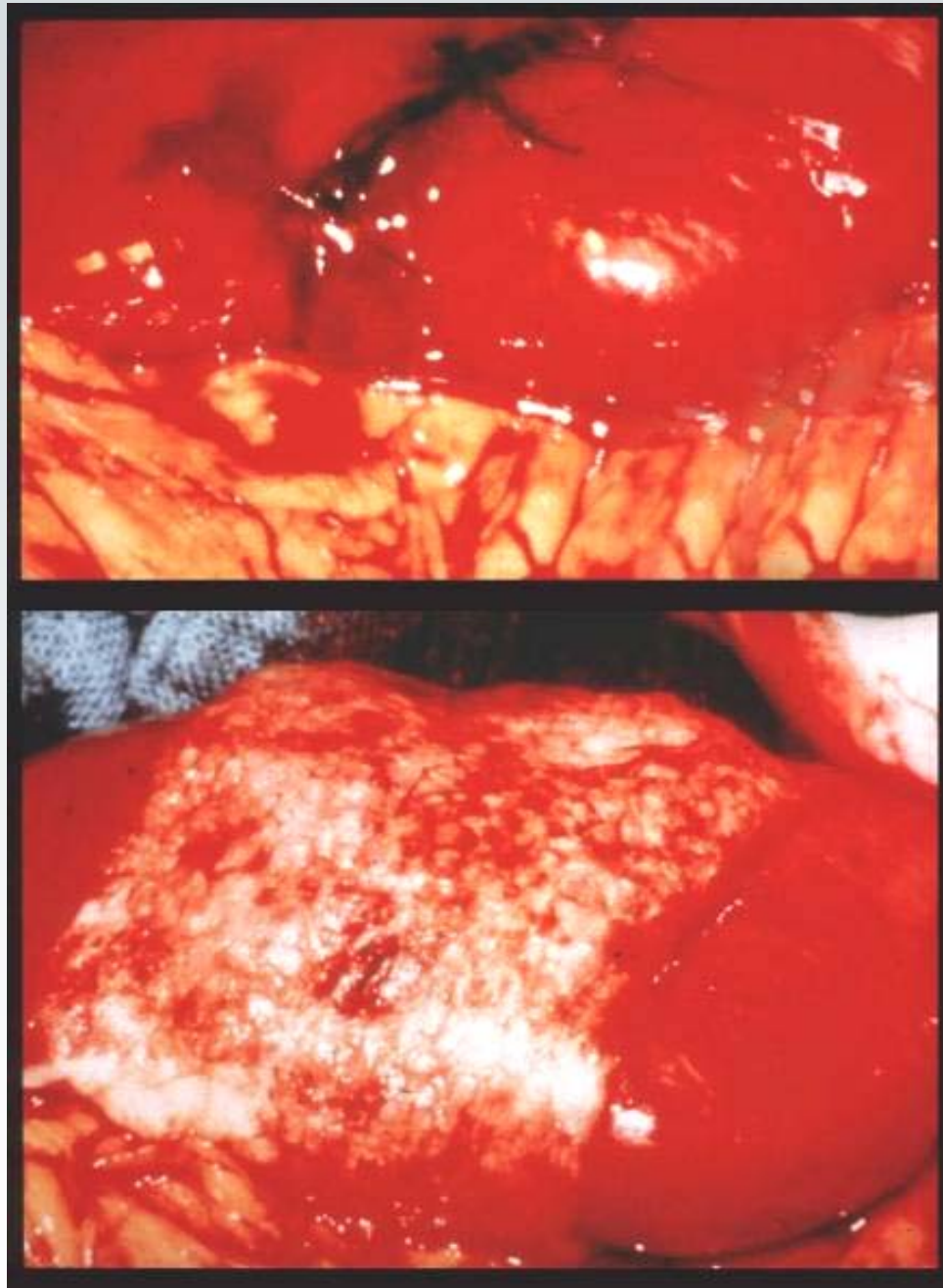
Traumatic splenic injury - surgical management

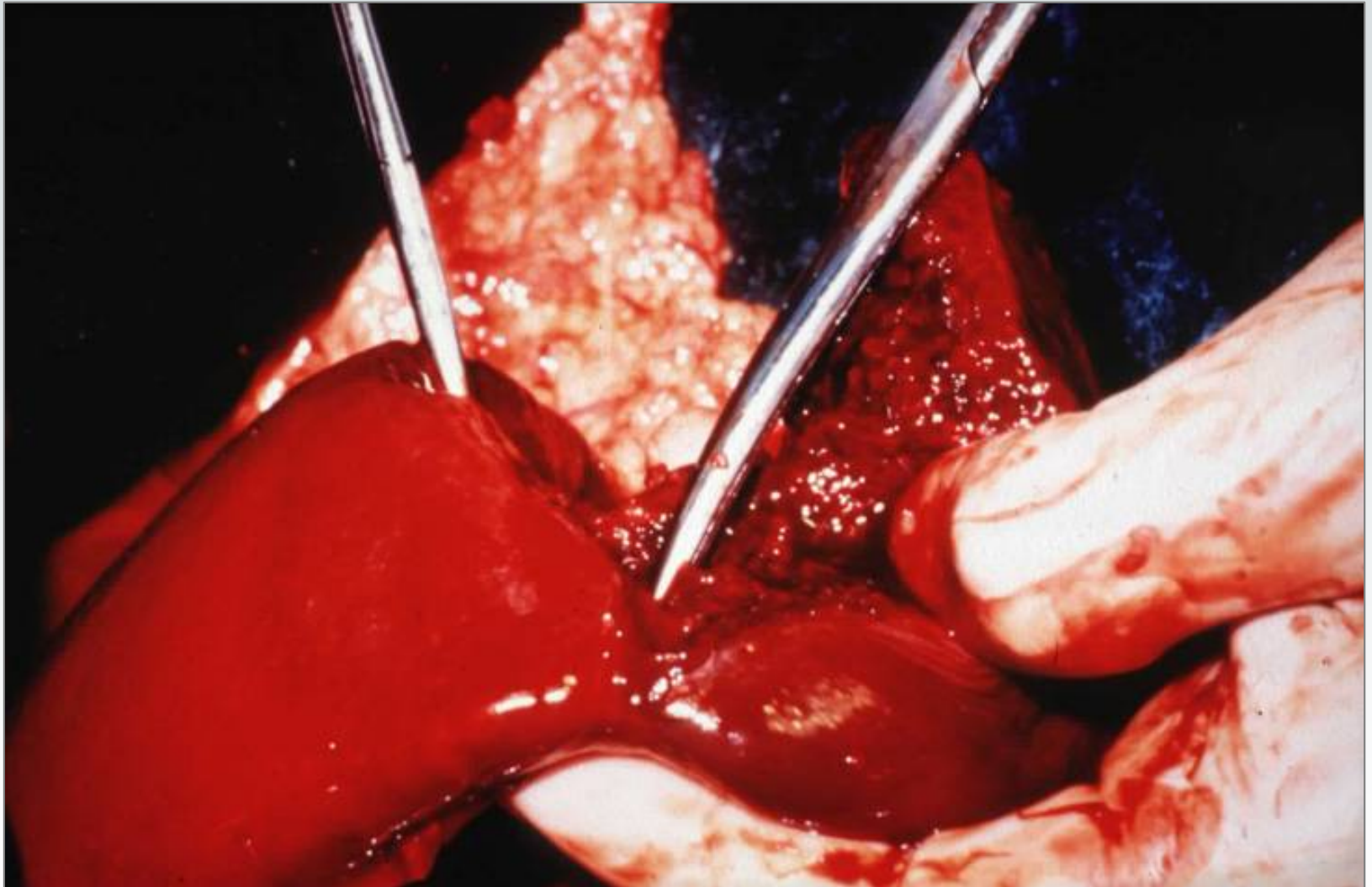
- | | | |
|------------|---|---|
| I | capsular defect/
subcaps. hematoma | infrared contact
coagulation |
| II | splenic rupture without hilus | suture/fibrin sealing |
| III | deep splenic rupture with hilus | partial resection/
suture/fibrin sealing |
| IV | bursting injury with
severe damage | splenectomy |

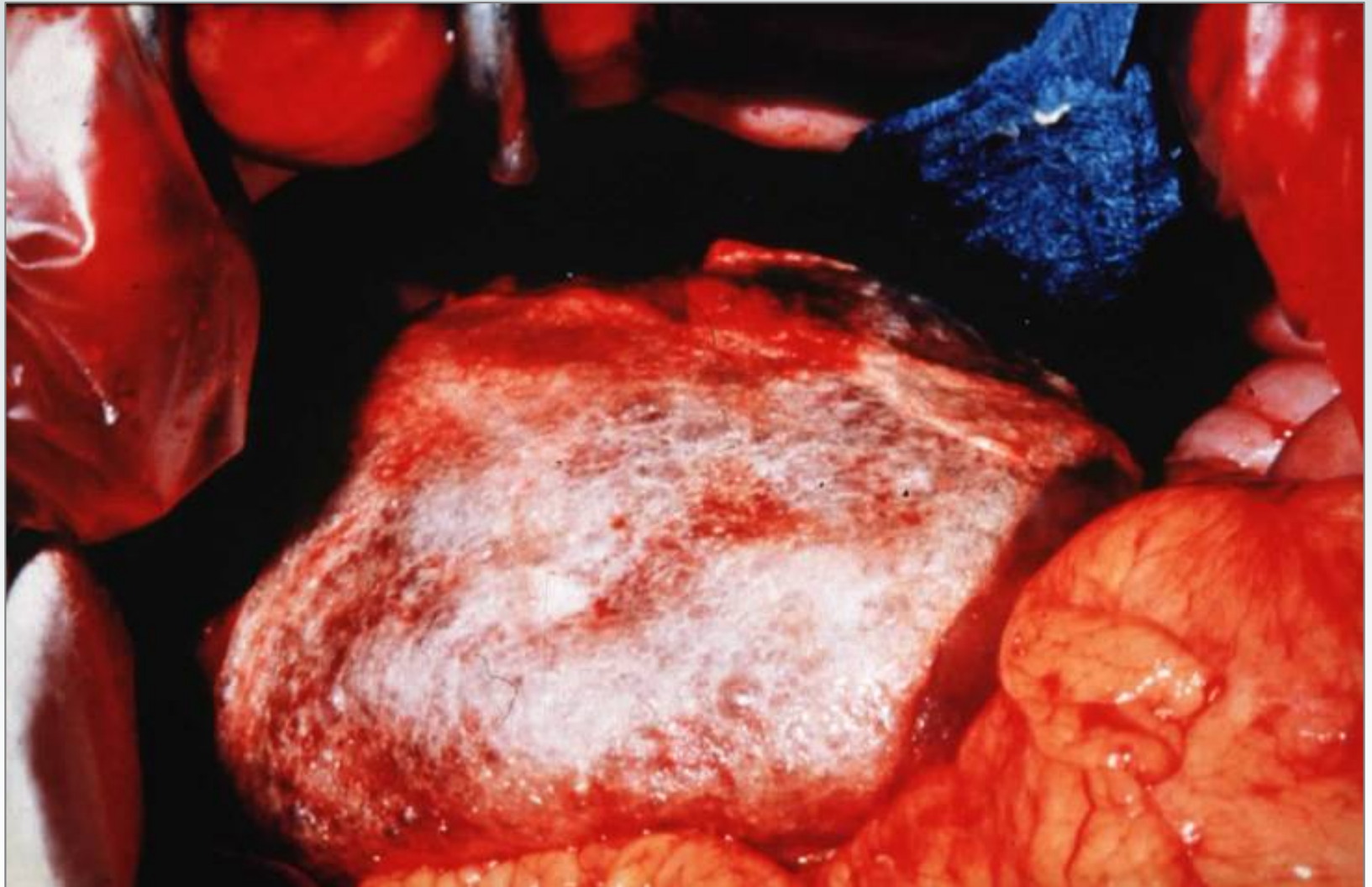












Management Classification for Hepatic Trauma

Class	Liver Injury	Management
I	Capsular avulsion Parenchymal fracture < 1cm deep	Fibrin Seeling Infrared Coagulation
II	Parenchymal fracture 1-3cm deep Subcapsular hematoma < 10cm diameter Parenchymal fracture < 1cm deep	Sutures Fibrin Seeling Infrared Coagulation
III	Parenchymal fracture > 3cm deep Subcapsular hematoma > 10cm diameter Central penetrating wound	Perihepatic Packing Individual Vessel Suturing Pringle Maneuver
IV	Lobar tissue destruction	Pringle Maneuver Perihepatic Packing Resectional Debridement Anatomical Resection
V	Retrohepatic Vena cava injury Extensive bilobar disruption	Total Vascular Exclusion Perihepatic Packing Individual Vessel Suturing Resectional Debridement Anatomical Resection
EE. Moore 1984 (Modified)		

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Management of Liver Injuries in Multiple Trauma

n = 113 (1982 – 1990)

Fibrin Sealing, Suture	n = 39	(34.5%)
Fibrin Sealing	n = 21	(18.5%)
Coagulation	n = 11	(9.7%)
Suture	n = 6	(6.2%)
Abdominal Packing	n = 14	(12.4%)
Abdominal Packing, Resection	n = 5	(4.4%)
Resection	n = 11	(9.7%)
Exitus	n = 6	(5.3%)



Management of Liver Injuries in Multiple Trauma

n = 113 (1982 – 1990)

Class			Mortality	
I	n = 21	(18.6%)	3	(14.3%)
II	n = 21	(18.6%)	2	(9.5%)
III	n = 42	(37.2%)	11	(26.2%)
IV	n = 25	(22.1%)	10	(40.0%)
V	n = 4	(3.5%)	4	(100%)



Incidence of Abdominal Organ Injuries in Multiple Trauma

n = 257 (1982 – 1990)

Spleen	n = 136	(52.9%)
Liver	n = 113	(44.0%)
Kidney	n = 57	(22.2%)
Small Bowel	n = 45	(17.5%)
Pancreas	n = 37	(14.4%)
Urinary bladder	n = 13	(5.1%)
Diaphragm	n = 11	(4.3%)
Greater Omentum	n = 4	(1.6%)
Stomach	n = 3	(1.2%)
Uterus	n = 1	(0.4%)



Number of Injured Abdominal Organs in Multiple Trauma

n = 257 (1982 – 1990)

One Organ	n = 108	(42.0%)
Two Organs	n = 77	(30.0%)
Three Organs	n = 48	(18.7%)
Four Organs	n = 17	(6.6%)
Five and More	n = 7	(2.7%)



Incidence of Blunt and Penetrating Abdominal Injuries in Multiple Trauma

n = 257 (1982 – 1990)

Blunt	n = 240	(93.4%)
Penetrating	n = 17	(6.6%)

