THORACIC AND ABDOMINAL INJURIES

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<th>Thoracic</th>
<th>Therapy</th>
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<td><strong>penetrating</strong></td>
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<td>Abdominal</td>
<td>Diagnosis ?</td>
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- **Thoracic**
  - Therapy
  - blunt
  - penetrating

- **Abdominal**
  - Diagnosis ?
  - Exploratory laparotomy

- **Image**: X-ray showing heart, vascular, and transdiaphragmatic.
THORACIC TRAUMA IS A SIGNIFICANT CAUSE OF MORTALITY

LESS THAN 10% OF BLUNT INJURIES AND ONLY ABOUT 15-30% OF PENETRATING INJURIES NEED THORACOTOMY
RIB FRACTURE

less than 3 ribs - children, old!

Lower ribs: SPLEEN? liver?
TREATMENT

BED REST? - NO
HALF SITTING POSITION
EXpectorants
ANALGESICS

ORAL ADMINISTRATION: NSAID
( INTERCOSTAL BLOCKADE )
EPIDURAL ADMIN.

PHYSIOTHERAPY

NO PREVENTIV ANTIBIOTICS
FRACTURE OF THE STERNUM

CARDIAC CONTUSION?

Hyperflexion mechanism:
FRACTURE OF THE TH. VI.-VII VERTEBRA?

NO SPECIFIC THERAPY
LIFE THREATENING INJURIES

A. INJURIES TO THE AIRWAYS (OBSTRUCTION)

B. TENSION PTX
   OPEN (SUCKING) CHEST WOUND
   MASSIVE HEMOTHORAX
   FLAIL CHEST
   PULMONARY CONTUSION

C. CARDIAC TAMPONADE
   BLUNT CARDIAC INJURY
   AORTIC RUPTURE

D. DIAPHRAGMATIC RUPTURE
   ESOPHAGEAL PERFORATION
FLAIL CHEST

2 OR MORE RIBS FRACTURED IN 2 OR MORE PLACES

PARADOXICAL MOTION OF THE CHEST WALL

COMPLICATIONS: HTX, PTX, PULMONARY CONTUSION

USUALLY INTUBATION AND RESPIRATORY TR.
Surgical stabilisation of ribs

- Metall loosening..
- If thoracotomy is indicated...
- New implants...
PNEUMOTHORAX

AIR BETWEEN THE PARIETAL AND VISCERAL PLEURA

RIB FRACTURES
INJURIES TO THE LUNG
INJURIES TO THE AIRWAYS
BULLAS
IATROGENIC

FROM THE RETROPERITONEUM
S.C. EMPHYSEMA
PNEUMOTHORAX

1.

2.
TENSION PNEUMOTHORAX

ONE WAY VALVE – AIR FROM THE LUNG OR THROUGH THE CHEST WALL INTO THE THORACIC CAVITY
CONSEQUENCE: HYPOXIA, BLOCKING OF THE VENOUS INFLOW
CHEST PAIN, AIR HUNGER, HYPOTENSION, NECK VEIN DISTENSION, TACHYCARDIA

CARDIAC TAMPONADE – NO BREATH SOUNDS

IMMEDIATE TREATMENT
TENSION PNEUMOTHORAX
HEMOTHORAX

BLOOD IN THE THORACIC CAVITY

LUNG LACERATION
RIB FRACTURE
INTERCOSTAL VESSEL INJURY
ART. MAMMARY INJURY
PENETRATING OR BLUNT INJURY
HEMOTHORAX

1. ?

2. !
HEMOTHORAX
PNEUMOTHORAX AND HEMOTHORAX
HEMOTHORAX

TREATMENT :
CHEST TUBE – THORACOTOMY IS RARELY INDICATED

INDICATION OF THORACOTOMY:

1500 ML / DRAINAGE

OR

200 ML/ HOUR FOR 2- 4 HOURS
HTX
HTX
HTX
1. 30 cm of water
2. Up to 80-100
PULMONARY CONTUSION

Symptoms: BLEEDING FROM THE TUBE
BAD SATURATION

DIAGNOSIS: CT
CHEST X RAY acutely NOT RELEVANT

IN YOUNG PATIENTS WITHOUT RIB FRACTURE!

RESPIRATORY TREATMENT
BAD OUTCOME - ARDS
CARDIAC TAMPONADE

BECK ‘S TRIAD
VENOUS PRESSURE ELEVATION
ARTERIAL PRESSURE DECLINATION
MUFFLED HEART SOUNDS

ECG
CARDIAC TAMPONADE
PERICARDIOCENTESIS
TRAUMATIC AORTIC RUPTURE

DECELERATION INJURY

USUALLY LETHAL

DG: X-ray signs

Aortography

CT

TREATMENT: P. stable or unstable /

systolic BP under 100mmHg

Interventional radiology - Surgery

mort: 10%  mort: 90%
AORTIC RUPTURE
Aortic stent graft
CARDIAC CONTUSION

HIGH ENERGY INJURY

ENZYMES?
ECG - ARRYTHMIAS
ULTRASOUND

NO SPECIFIC THERAPY
MEDIASTINAL AIR

TRACHEOBRONCHIAL TREE INJURY

OESOPHAGUS INJURY

TRAVERSING WOUNDS

SEVERE INJURIES
DIAPHRAGMATIC INJURY

USUALLY ON THE LEFT SIDE
LIVER IS BLOCKING
DIAGNOSIS SOMETIMES IS NOT EASY
LEFT SIDE: NASOGASTRIC TUBE
+ CONTRAST MATERIAL
RIGHT SIDE: CT?

TREATMENT: THORACOTOMY
DIAPHRAGMATIC RUPTURE
Penetrating injuries

ER thoracotomy ???
ABDOMINAL INJURIES

BLUNT or PENETRATING

PARENCHYMAL ORGAN - BLEEDING
  SPLEEN
  LIVER
  MESENTERIUM
  RETROPERITONEAL ORGANS
HOLLOW ORGAN RUPTURE
  INTESTINES
  STOMACH
PENETRATING INJURIES

WOUND REVISION IN THE OPERATING ROOM

IF THE PERITONEUM IS INJURED
LAPARATOMY IS OBLIGATORY

USUALLY THE STANDARD LAPARATOMIES ARE INDICATED
ABDOMINAL INJURIES

MECHANISM OF INJURY
BLUNT TRAUMA
WOUNDS

PHYSICAL EXAMINATION
RECTUM, VAGINA?
FAST - ULTRASOUND
X RAY – FREE AIR
CT SCAN
LAVAGE

ANGIOGRAPHY?
BLUNT INJURIES

LIVER
  CONSERVATIVE TREATMENT
SPLEEN
  SURGERY
MESENTERIUM

SMALL INTESTINE
  ON FIXED PLACES: DUODENUM, FLEXURA
  DUOD. JEJUNALIS
LARGE INTESTINE
  ON FIXED PLACES: FLEXURAS

PANCREAS
KIDNEYS
LAVAGE
LAVAGE
INJURY SCALES FOR PARENCHYMAL RUPTURES

SPLEEN / LIVER RUPTURE

I. SUBCAPSULAR HAMATOMA < 10 %  SAME
   LACERATION < 1 CM  SAME

II. SUBCAPSULAR HAEMATOMA 10-50%  SAME
    LACERATION BETWEEN 2 AND 5 CM  <10CM
    INTRAPARENCYHMAL ø  <10CM

III. SUBCAPSULAR HEMATOMA > 50%  SAME
     LACERATION > 5 CM  >10CM

IV. LACERATION  25-75% OR 3 SEGMENTS

V. COMPLETE LACERATION  MORE THAN 75% OR 3 S.
   HILUS DAMAGED  MAJOR VENOUS INJURY
SPLEEN RUPTURE

Therapy: conservative to grade I-II  72 hours-21 days!
grade III
surgery for grade IV-V

SPLENORRAPHY BUT USUALLY SPLENECTOMY
CHILDREN?

PNEUMOCOCCUS INFECTION
ANTIBIOTICS
VACCINATION
SPLEEN II. GR. LACERATION BETWEEN 2 AND 5 CM
SPLEEN RUPTURE GR. III.
SPLEEN V. GRADE
LIVER GRADE II. INTRACAPS. LESS THAN 10 CM DIAMETER
LIVER GR. III.
LIVER GR. III.
LIVER GR.V. VENA CAVA INJURY
LIVER GR. IV.
RENAL INJURIES

DG: ULTRASOUND
CT
IV PYELOGRAPHY (One-shot IVP)
ARTERIOGRAPHY

TREATMENT: NONOPERATIVE
OPERATIVE

NEPHRECTOMY IS RARELY INDICATED
OTHER KIDNEY?
BLUNT TRAUMA!

- HOLLOW ORGAN RUPTURE
- INTESTINES:
  - SMALL INTESTINE:
  - ON FIXED PLACES: DUODENUM, FLEXURA
  - DOUD. JEJUNALIS…
  - LARGE INTESTINE
  - ON FIXED PLACES: FLEXURAS…

- COMPLICATIONS AFTER DELAYED DIAGNOSIS!
HAVE A NICE DAY

😊