INJURIES TO THE TRUNK

THROACIC AND ABDOMINAL INJURIES
INITIAL ASSESSMENT

1. PRIMARY SURVEY  (1. MIN)
2. VITAL FUNCTIONS
   TREAT LIFE THREATENING FIRST
3. SECONDARY SURVEY
4. DEFINITIVE CARE

A.B.C.D.E.
LIFE THREATENING INJURIES

A. INJURIES TO THE AIRWAYS

B. TENSION PTX
   SUCKING CHEST WOUND
   MASSIVE HEMOTHORAX
   FLAIL CHEST

C. CARDIAC TAMPONADE
   MASSIVE HEMOTHORAX
LIFE THREATENING CHEST INJURIES

- PNEUMOTHORAX
- HEMOTHORAX
- PULMONARY CONTUSION
- TRACHEBRONCHIAL TREE INJURY
- BLUNT CARDIAC INJURY
- TRAUMATIC AORTIC INJURY
- TRAUMATIC DIAPHRAGMATIG INJURY
- MEDIASTINAL TRANSVERSING WOUNDS
PNEUMOTHORAX

AIR BETWEEN THE PARIETAL AND VISCERAL PLEURA

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

FROM THE RETROPERITONEUM
1. PNEUMOTHORAX

2. PNEUMOTHORAX
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
TENSION PTX NEEDLE
THORACOCENTESIS
HEMOTHORAX

BLOOD IN THE THORACIC CAVITY

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

1. ?

2. !

[Image of chest X-ray with annotations]
HEMOTHORAX

TREATMENT:
CHEST TUBE – THORACOTOMY IS RARELY INDICATED

THORACOTOMY:
1500 ML / DRAINAGE

OR

200 ML / HOUR FOR 2-4 HOURS
PULMONARY CONTUSION

BLEEDING FROM THE TUBE
BAD SATURATION
CHEST X RAY SOMETIMES NOT RELEVANT
DIAGNOSIS SOMETIMES DAYS LATER
IN YOUNG PATIENTS WITHOUT RIB FRACTURE
CT ?

RESPIRATORY TREATMENT
BAD OUTCOME - ARDS
MEDIASTINAL AIR

TRACHEOBRONCIAL 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
CARDIAC TAMPONADE

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

ECG
AORTIC RUPTURE

DECELERATION INJURY
USUALLY LETHAL
TREATMENT: SURGERY
EXPERIENCED CARDIAC SURGEON,
EXTRACORPORAL CIRCULATION
SURGERY IS USUALLY NOT IMMINENT
AORTIC RUPTURE
CARDIAC CONTUSION

HIGH ENERGY INJURY

ENZYMES?
ECG - ARRYTHMIAS
ULTRASOUND

NO SPECIFIC THERAPY
RIB FRACTURE

SPLEEN?
TREATMENT

BED REST?
HALF SITTING POSITION
EXpectorants
Analgesics
INTERcostal blockade
ORAL ADMINISTRATION
EPIDural ADMIN.
PHYSIOTHERAPY
NO ANTIBIOTICS
FLAIL CHEST

2 OR MORE RIBS FRACTURED IN 2 OR MORE PLACES

DISRUPTION IF THE CHEST WALL

PULMONARY CONTUSION

PARADIOXICAL MOTION OF THE CHEST WALL

USUALLY INTUBATION AND RESPIRATORY TR.
FRACTURE OF THE STERNUM

CARDIAC CONTUSION?

FRACTURE OF THE TH. VI.-VII VERTEBRA?

NO SPECIFIC THERAPY
WOUNDS

1

2

3
ABDOMINAL INJURIES

RULE OUT

BLEEDING
  SPLEEN
  LIVER
  MESENTERIUM

HOLLOW ORGAN RUPTURE
  INTESTINES
  STOMACH
BLUNT INJURIES

DIAGNOSIS SOMETIMES DIFFICULT

RETROPERITONEAL INJURIES OFTEN LETHAL

SURGERY SOMETIMES DIFFICULT

RECONSTRUCTION OR ANUS PRAE?
LAVAGE
WOUND REVISION IN THE OPERATING ROOM

IF THE PERITONEUM IS INJURED LAPARATOMY IS OBLIGATORY

USUALLY THE STANDARD LAPARATOMIES ARE INDICATED
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

USUALLY SPLENECTOMY
CHILDREN?

PNEUMOCOCCUS INFECTION
ANTIBIOTICS
VACCINATION
SPLEEN II.GR. LACERATION BETWEEN 2 AND 5 CM
SPL3
LIVER GRADE II. INTRACAPS. LESS THAN 10 CM DIAMETER
LIVER GR. III.
ARTERIA HEPATICA INJURY (RIGHT)
ABDOMINAL COMPARTEMENT SYNDROME

THE RISE OF THE INTRAABDOMINAL PRESSURE

CAUSE: USUALLY RETRO – INFRAPERITONEAL BLEEDING
CONSEQUENCE: DETERIORATION OF THE ABDOMINAL BLOOD FLOW
CONSEQUENCE: INTESTINAL BARRIER FUNCTION DETERIORATED
CONSEQUENCE: TOXINEMIA, SIRS, MOF.
KIDNEY