MANAGEMENT OF BLUNT INJURIES

TO THE ABDOMEN

This is subitted in partial fulfilment for master degree of surgery.

By

Dr. Salah Eil Dien Fouad Amin Rostom.

(M.B.,B.ch., Aim Shams University)

Supervised by

PROF. DR. M. SAMEH ZAKI

Prof. of General surgery

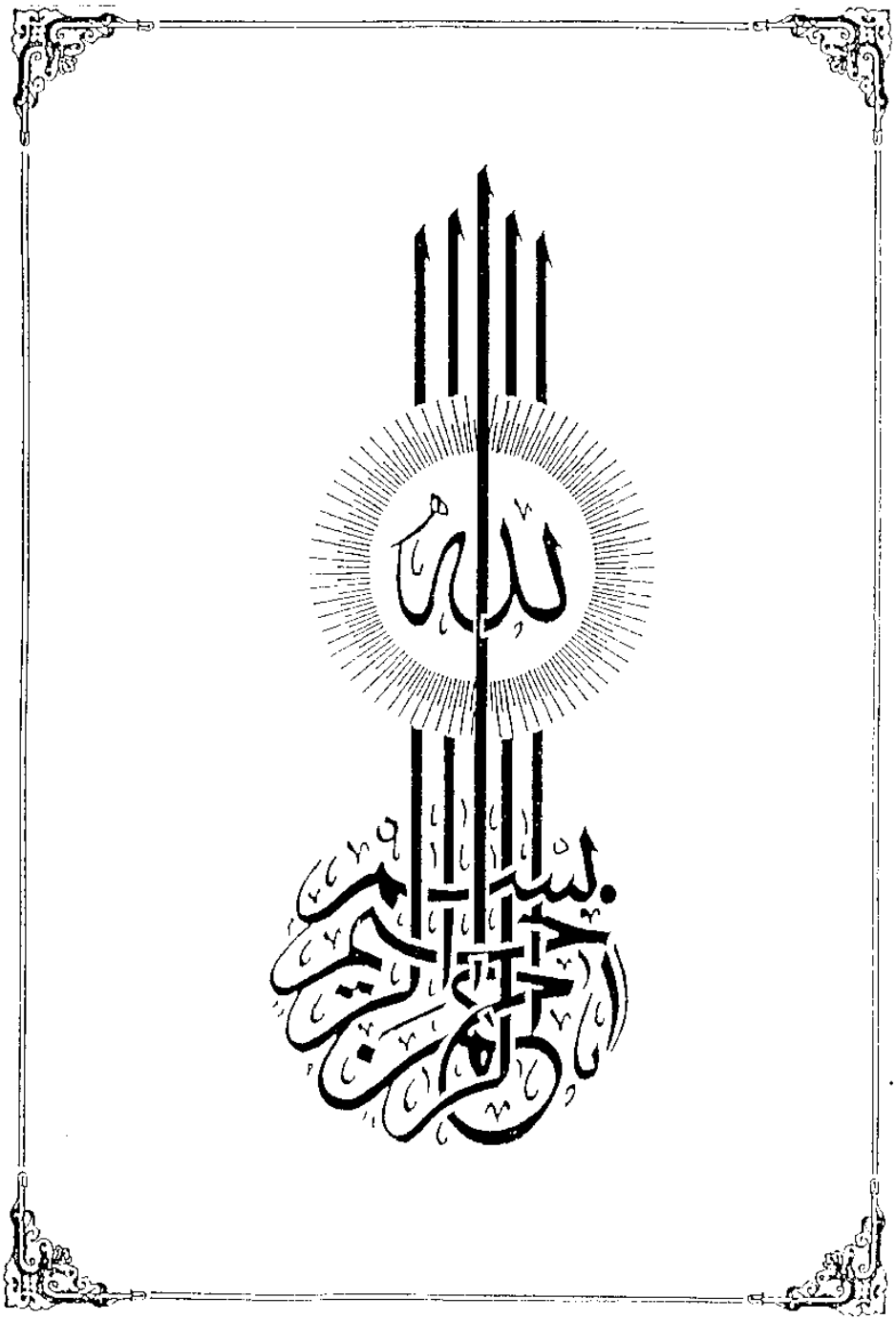
Faculty of Medicine

Ain Shams University

I994

ACKNOWLEDGMENTS

I would like to express my great thanks to Prof . Dr. M.S. zaki for his great work and undeniable efforts in helping me to prepare and write this subject. I would like also not tp forget the great help, I had recieved from Dr. Hussein Bechnak, who had gave me many advices during writting the subject.



CONTENTS

-oooOooo-

- I -

INTRODUCTION AND CLASSIFICATION

The traumatized person is a common daily presentation to any accident and emergency departement. The incidence of trauma is gradually increasing with the increasing mechanisation and the increasing Velocity of transport. (Darin, 1980).

This increase readhes in some localities an epidemic level. Trauma now is the third human Killer (5%) after the cardio vascular diseases (50%) and malignant diseases (25%)

Patients who die as a result of trauma are usually young people in the active stages of their lives. A large number is left with disabilities and this aggravates the effect of trauma on the human life. Trauma inflicted on the human body results in any combination of injuries in the various parts of the body, but we are concerned here with the blunt injuries to the abdomen (Trunkey, 1978)

Abdominal trauma can be classified according to the causative agent of the trauma, anatomical sit involved in the injury, and the presence or absence of associated injuries. (Darin, 1980).

Classification according to the causative agent of the trauma

The trauma inflicted on the abdomen can be penetrating injuries: e.g stab wounds or gunshot wounds, blunt injuries: e.g blast injuries, sport injuries or by motor-cars, and iatrogenic: (Those are caused as a result of use of Certain diagnostic procedures e.g endoscopy, paracentesis; or needle liver biopsy.)

Classification according to the anatomical sit involved in the injury

The abdominal cavity contains solid organs, hollow viscera and blood vessels. The volume of those structures is more than can be imagined from measuring the surface area of the anterior abdominal wall. This wall is the anterior boundary of the abdominal cavity, posteriorly there is the posterior abdominal wall, from above there is the diaphragm whic separates the abdominal and thoracic cavities, from below, the abdominal cavity continues into the pelvic cavity. The two cupola of the diaphragm arch upwards, that, some of the abdominal organs disappear under the doms of the diaphragm, hidden anteriorly by the lower ribs e.g the liver,

the spleen, part of the stomach , and the upper poles of the kidneys with the suprarenal glands. The spleen is in the upper left quadrant of the abdominal cavity. The liver is in the upper right quadrant. The pancrease is a retro peritoneal structure present transversally across the vertebral column. The duodenum and ileo caecal region are fixed to the posterior abdominal wall. The total length of the small intestin lies free on it's own mesentry, and a good volume of it is contained in the pelvic cavity. Ascending and descending colon are fixed to the posterior abdominal wall. Transverse and sigmoid colon are mobil on their mesentry. The rectum is present in the concavity of the sacrum. The Kidneys with their ureters and supra-renal glands lie behind the peritoneum of the pasterior abdominal wall. The aorta with it's great branches, and the vena cava with it's tributaries lie retro-peritonealy. (Darin, 1980) N.B Lack of Fixation of an organ in the abdomen, makes it difficult to be injured by blunt trauma (shires, 1980), especially by compression. To summarize, the abdominal organs may by solid or hollow:-

1- Solid organs : : Intra Peritoneal - spleen and liver.

- Extra peritoneal - supra renal glands and the pancrease & great vessels.

2- Hollow viscera: - gastro intestinal tract, genitourinary tract.

Classification according to the presence or absence of associated lesions

Most of the accidents result not only in abdominal injures, but usually the patient is presented with multiple injuries. So, we may find abdominal injuries with head injury, or abdominal injury with thoracic injuries or abdominal injury with limb fractures. Sometimes the abdominal injury may occur in a pregnant female, this type of patient needs special care. Abdominal injuries may occur in association with spinal shock.

Also, the abdominal injuries may be associated with physiological troubles e.g upper air way obstruction by secretions or blood, massive pneumothorax or haemo-thorax, tracheal injury, all those problems will affect the normal respiration, and need immediat interference to prevent sever hypoxia and then anoxia to the brain. (Darin, 1980).

MACHANISM OF BLUNT TRAUMA TO THE ABDOMEN

Blunt abdominal trauma generally leads to higher mortality rates than penetrating wounds, and presents greater problems in diagnosis. This blunt trauma can be caused by different mechanisms. (Dickerman and Dunn, 1981)

1- Sudden deceleration of the body:-

When the body is travelling forward at a high speed and then he stops suddenly, the loosely attached viscera will continue to travel forward at the same speed resulting in sever injury, especially to the renal or splenic pedicles. The root of the mesentry may be torn resulting in rupture to one or more of the mesentric vessels. (Baylis et al., 1962)

Sometimes, sudden stretch of an intra-abdominal artery may occur resulting in laceration of the intimal lining (Perdue and Smith, 1968). This laceration may be minimal, where it will be healed, or followed by thrombosis and ischaemic manifestation, then necrosis of the affected part of the body. The laceration may be major and extends to all layers of the artery, that complete cut of the artery will occur, leading to fatal internal haemorrhage if it is a great artery. (Patman et al., 1964).

2- Compression of the abdomen:-

This is very commonly produced dfter motor vechiles accidents, or after sudden blow to the abdomen.

Compression of the abdomen can affect the anterior abdominal wall, the solid organs or the hollow viscera. The blow which rupture the very powerful muscles of the anterior abdominal wall, is likely to affect the viscera, but not the reverse e.g A trauma is very likely to affect intra abdominal viscera without any effect on the anterior abdominal wall. This is produced when the person receives sudden blow with relaxed anterior abdominal wall muscles, where extensive visceral injury is produced, and nothing happen to the anterior abdominal wall. But if the person take guard of this blow, minimal visceral injury will be produced and there may be traumatic hernia from rupture of the rectus abdominis. (Elerding and Moore, 1980)

3- Blast injuries:-

Those injuries can be produced by Military blast injuries e.g from bombs., industrial accidents., household explosions, and personnel submerging in water.

The injury produced depends on the blast space proximity and also on the detonation size. (Thomas and paul, 1977).

Lung alveolar damage and air embolism followed by death can be produced by large explosions, Which can also produce abrasions, lacerations, or bruises. (Thomas and paul, 1977).

PATHOLOGY OF THE INJURED ORGAN

The incidence of abdominal trauma increases each year. Any intra abdominal organ is likely to be traumatized, but the spleen liver, kidneys, and bowel are the most frequently injured abdominal viscera. The frequency of injury is as follows (McClelland et al., 1982) :

Injured viscera	Frequency %
spleen	26.2
Kidneys	24.2
Intestines	16.2
Liver	15.6
abdominal wall	3.6
Retroperitoneal haematoma	2.7
Mesentry	2.5
Pancrease	1.4
Diaphragm	1.7

The spleen is the commonest organ affected by blunt trauma to the abdomen (Awe and Eidmiller, 1973.). The history of trauma is usually present, but the trauma may be so mild that the patient don't mention it and presented only with abdominal pain.