Incisional hernia
Etiological factors and managment

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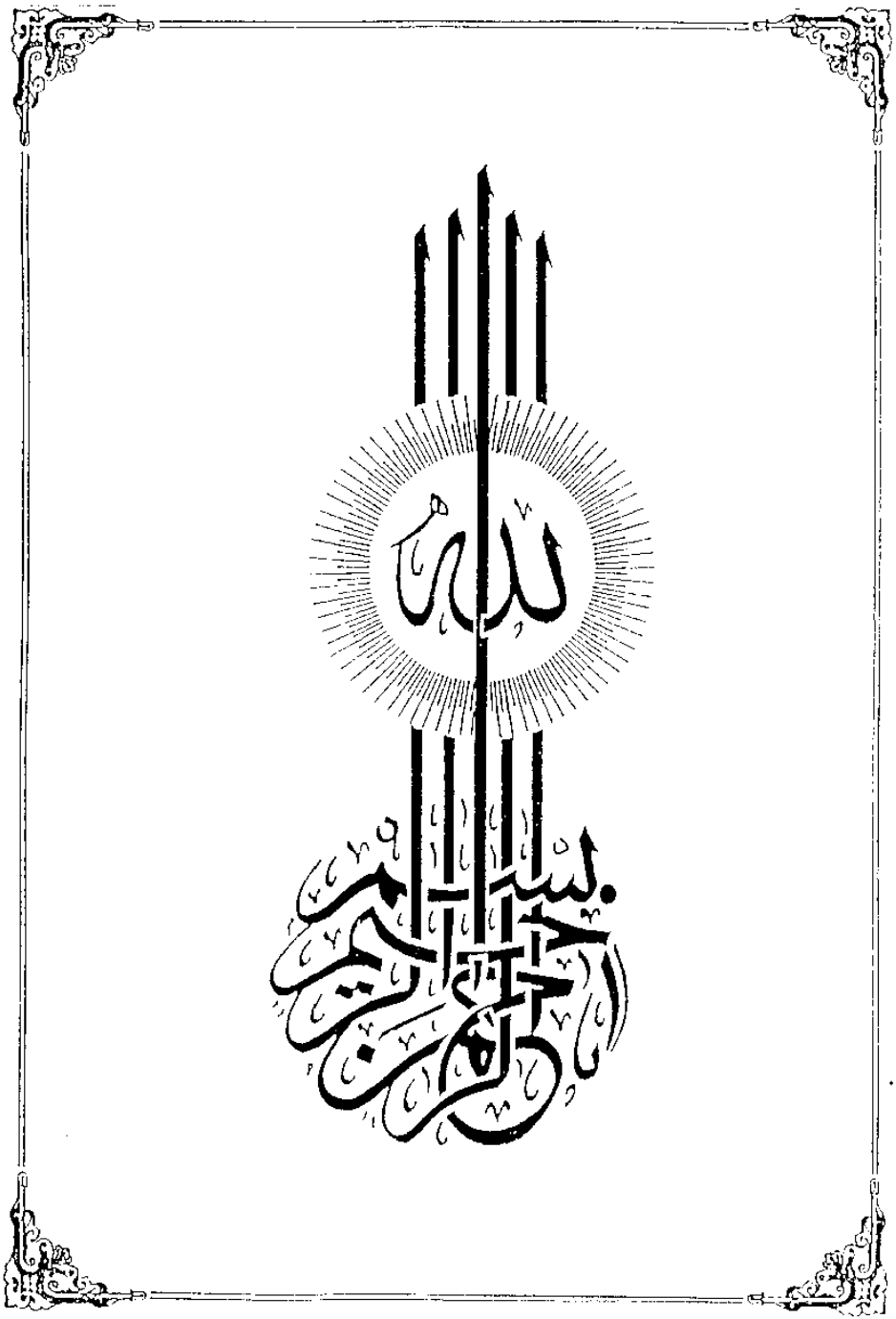

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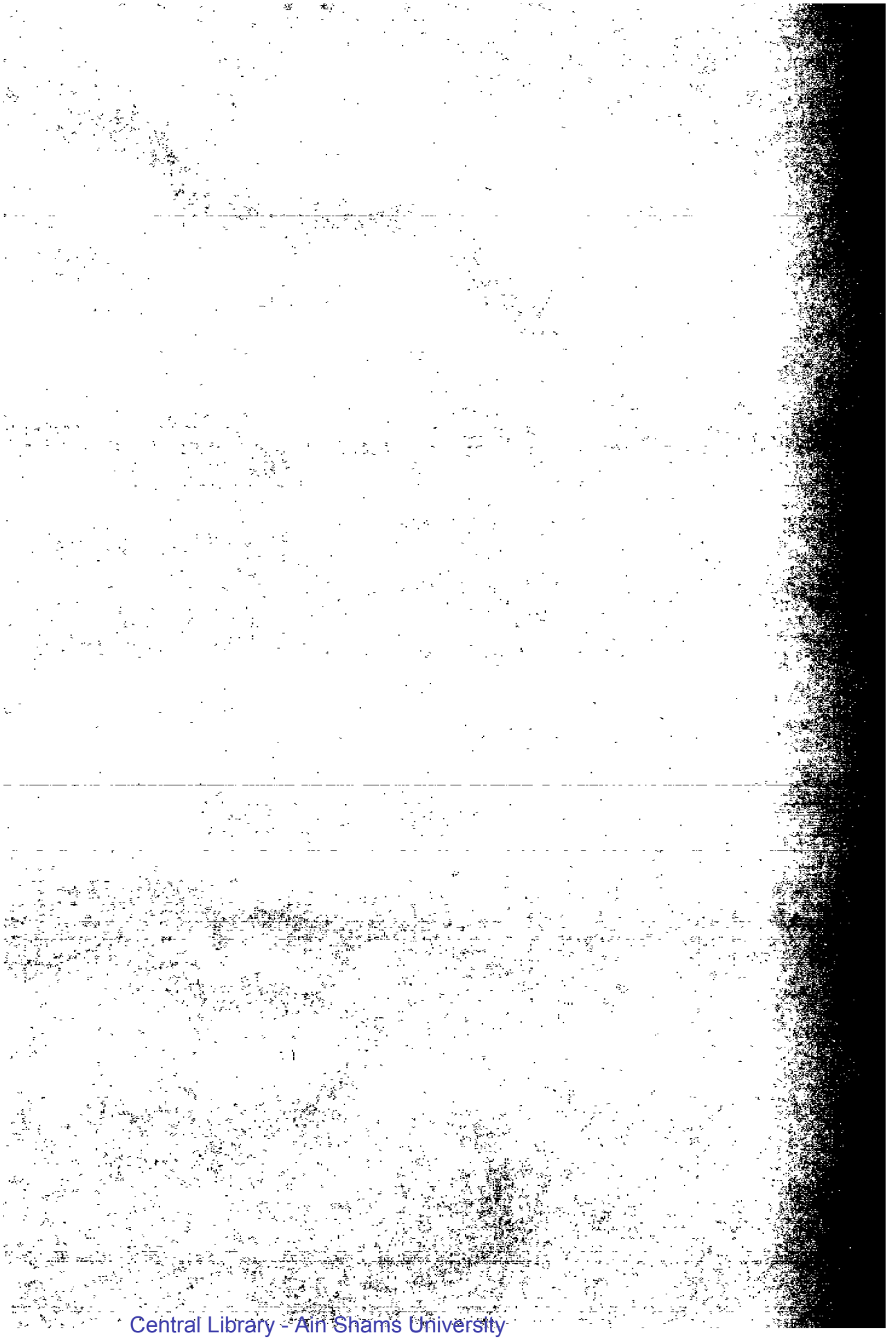

The incisional hernia

Incisional (cicatricial,wound scar) hernias are those which follow operative or accidental division of the anterior abdominal wall. The majority of these are postoperative.

Introduction

With the evolution of modern surgery and the rapid increase in the number of abdominal operations performed,incisional hernias have risen in frequency. It constitutes the second most frequent type of hernias after the inguinal hernias .

(Nyhus)

Incisional hernia may reach a huge size and represent a proplem that always challenged the surgons due to extensive operative manipulations needed,the huge volume of extruded abdominal contents to be reposited in the peritoneal cavity, the frequency of incarceration,the large defect to be repaired and the high incidence of recurrence rate.

Aim of work :

Is to study the proplem of incisional hernia as regards

the different etiological factors and different methods of its management.

The anatomy of the anterior abdominal wall

The anterior abdominal wall is bounded by the costal margins and xiphoid process above and by the iliac crest, inguinal ligaments and pubis below.(F.Nora)

It is composed of six layers of tissues are:

1)The skin.

2)Superficial fascia.

3) The muscle layer.

4) Transversalis fascia.

5) Extra peritoneal fat.

6) Peritoneum.

1) The skin:

This varies in texture being thin in front thick behind. The natural lines of cleavage of the skin are very constant and of great importance to the cosmotic appearance of healed incisions. An incision along a cleavage line will tend to heal as a hair line scar. An incision across these lines will tend to heal with a wide scar. The cleavage lines run almost

2) The superficial fascia:

It is composed of a superficial fatty layer much thickened in females. The fat of which is contained in loculi whose fibrous wall is connected with the overlying dermis on one side and condensed into a thin but strong membrane on the other side forming the membranous layer of the superficial fascia. It is also called the fascia of Scarpa. This fascia of Scarpa allows the subcutaneous fat to slide freely over the underlying rectus sheath and external oblique aponeurosis. So the skin of the anterior abdominal wall is loosly attached to the deep structures except at the umbilicus where it is firmly adherent. There is no deep fascia in the anterior abdominal wall to allow free movement during respiration.(Last)

3) The muscle layer:

On each side there are three layers of muscles. From the surface inwards they are the external oblique,internal oblique and the transversus abdominis. Their fibres have different directions to strengthen the anterior abdominal wall and prevent herniation of viscera through it.

a) The external oblique muscle: Arises by fleshy fibres from the lower eight ribs at their anterior angles. The upper fibres are directed horizontally in a medial direction,the

intermediate one directed downwards and forwards and the lower fibres vertically down forming a wide aponeurotic insertion. It is inserted along a line from the xiphoid process,linea alba,pubic crest,pubic tubercle,anterior superior iliac spine and the anterior half of the outer lip of the iliac crest. The lower free border of the aponeurosis is folded upon itself forming the inguinal ligament.

The inguinal ligament: It is the folded free lower border of the external oblique aponeurosis. It extends from the anterior superior iliac spine to the pubic tubercle. The lateral part of the grooved inner aspect of the ligament gives origen to the internal oblique and transversus abdominis muscles.

Just above and lateral to the pubic tubercle an oblique V shaped gap in the ext-nal oblique aponeurosis,it is the superficial inguinal ring which gives passage to the structures forming the spermatic cord in males or the round ligament in females and the ilio-inguinal nerve.

The lacuner ligament:

Arises from the medial end of the inguinal ligament.It extends backwards and upwards to the pectineal line. Its cresetic free edge forms the medial margin of the femoral ring.

The reflected ligament: Is formed by reflexion of some

fibers of the medial part of the inguinal ligament. It extends upwards and medially into the linea alba.

The lumbar triangle: It is bounded by the anterior border of latissimus dorsi posteriorly, the posterior free border of external oblique anteriorly and the iliac crest inferiorly. Its floor is the internal oblique. It is the site of lumbar hernia.

b) Internal oblique:

Arises along a line from the lateral two thirds of the inguinal ligament, the anterior two thirds of the intermediate line of the iliac crest and the lumbar fascia. Its fibres are directed upwards, forwards and medially to be inserted by an aponeurosis into the lower six costal cartilages, xiphoid process, linea alba, pubic crest and pectineal line. The lower fibers form a fleshy arch from the origin in the iliac crest to the insertion into the pubic tubercle and pectineal line. This arch fuses with the fibres of the transversus abdominis forming the conjoint tendon.

c) Transversus abdominis muscle:

This muscle has a very long origin from the inner surface of the lower six costal cartilages, lumbo-dorsal fascia, the inner lip of the anterior two thirds of the iliac crest, fascia iliaca and the lateral one third of the inguinal ligament. The

fleshy fibres become aponeurotic and pass transversly behind the rectus muscle to fuse with the internal oblique aponeurosis to be inserted in the xiphoid process,linea alba,pubic crest and pectineal line. The lower fibres unite with the fibres of the internal oblique to form the conjoint tendon.

d) The rectus abdominis muscle;

Arises by two heads a medial one from the front of the symphysis pubis and a lateral one from the upper border of the pubic crest.Its insertion is along a horizontal line into the xiphoid process,fifth,sixth,and seventh costal cartilages.

Typically three tendinous intersections are found in the muscle one at the umbilicus,one at the xiphisternum and one inbetween. These tendinous intersections represent the lines of fusion of myotomes as the muscle is formed by fusion of mesodermal somites as indicated by constant segmental innervation. These tendinous intersections are connected to the anterior rectus sheath. They don't penetrate to the posterior surface of the muscle and the muscle has no connection with the posterior wall of the rectus sheath. (Gardner)

The rectus sheath:

Is formed by the aponeurosis of the oblique muscles and the transversus abdominis. At the lateral border of the rec-

tus muscle the aponeurosis of internal oblique splits into an anterior and posterior lamellae. The anterior lamella fuses with the external oblique aponeurosis and pass in front of the rectus muscle forming the anterior wall of the rectus sheath. The posterior lamella fuses with the transversus abdominis aponeurosis behind the rectus muscle forming the posterior wall of the rectus sheath.

The anterior wall of the rectus sheath can be divided by two transverse lines into three parts. The first line(line A) lies midway between the umbilicus and xiphisternum and the second line midway between the umbilicus and symphysis pubis. These parts are:-

Part (1) above line A formed only by the aponeurosis of the external oblique.

Part (2) between line A and line B. It is formed by the aponeurosis of the external oblique and the anterior lamella of the internal oblique aponeurosis.

Part (3) below line B formed by the aponeurosis of the external and internal obliques and transversus abdominis.

Also the posterior wall of the rectus sheath can be divided by the same lines into:

Part (1) above line A formed by the fleshy fibers of transversus abdominis.

Part (2) between line A and line B. Formed by the aponeurosis of transversus abdominis and the posterior lamella of internal oblique.

Part (3) below line B. In this part the posterior wall of the rectus sheath is deficient becouse the aponeuroses of the three muscles pass into the anterior wall and the posterior wall is formed only by the transversalis fascia. The lower border of the posterior wall of the rectus sheath at line B is called the arcuate line or the semicicular fold of Douglas.

Pyramidalis muscle: Is a small triangular muscle arises from the pubic crest between the recti muscles. It converges with its follow into the linea alba to be inserted one inch or more above its origin. It may be abscent in one or both sides. Its action is stretching the linea alba.

The linea alba: Lies in the middle line of the anterior abdominal wall. It is a strong fibrous structure formed by fusion of the aponeuroses of the three muscles of the anterior abdominal wall. Above the symphysis pubis it is very narrow and the two recti are in contact behind it. As it passes upword it becomes broad and very tough. It is attached strongly to the symphysis pubis below and to the xiphisternum above.

Actions of the abdominal muscles:

1) Support the viscera mainly the intestine as if the abdominal wall is splited or removed only the intestine spill out. Other heavy abdominal organs as the liver,spleen,kidney and the stomach have other supporting factors.

2) Moving the trunk: The rectus abdominis is the most powerful flexor. Also when the external obliques contract simultaneously they aid the rectus muscle in flexing the trunk. When the external oblique of one side acts with the internal oblique of the other side they rotate the trunk.

3) The abdominal wall muscles compress the abdomin agan-ist the vertebral column causing rise of the intra abdominal pressure. So these muscles are important in respiration,defecation,micturition and parturition.

I*) The transversalis fascia:

This is a thin layer of fascia that covers the deep surface of the transversus abdominis muscle reinforcing the unprotected areas of the abdominal wall as below the semicircular fold of Douglas where the posterior wall of the rectus sheath is abscent the fascia is strong and in immediate contact with the muscle.

The deep inguinal ring: Is a small opening in the fascia

transversalis. It lies about half an inch above the midpoint of the inguinal ligament. It gives passage for the spermatic cord or round ligament and from its margin a fascial prolongation extends around the cord and testis forming the internal spermatic fascia.

(V) Extraperitoneal fatty tissue: This is a layer of areolar fatty tissue of variable thickness which lies between the fascia transversalis and the parietal peritoneum. It is separated from the transversalis fascia by a fissil plane and acts as a support of the peritoneum. (Nyhus)

(VI) The parietal peritoneum: It is attached to the anterior abdominal wall by the extraperitoneal areolar tissue.

The nerve supply of the abdominal wall:

It is supplied segmentally by the lower six thoracic nerves and the first lumbar nerve. The lower five intercostal and subcostal nerves pass behind the costal margin between the interdigitations of the diaphragm and the transversus abdominis muscle. Then they run downwards,forwards,and medially between transversus and internal oblique. Then between internal and external oblique to pierce the posterior rectus sheath to end as anterior cutaneous nerves.