Recent trends in management of incisional hernia

Essay
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Aim of work:

Aim of this study is to highlight the new techniques in management of incisional hernia focusing on laparoscopic approach.

INTRODUCTION

Incisional hernia is a result of failure of lines of closure of abdominal wall following surgery, it is a bulge or protrusion near or directly along a prior abdominal surgical incision. It can develop in the scar tissue around any surgery performed in the abdominal area, from the breast down to the groin. Incisional hernias remain one of the most common surgical complications with a long-term incidence of 10-20% ***(Schumpelick, et al., 2006).***

The factors that increase the risk of incisional hernia are conditions that increase strain on the abdominal wall, such as tension and poor healing conditions, obesity, advanced age, malnutrition, poor metabolism, pregnancy, dialysis, excess fluid retention, and either infection or haematoma after a prior surgery. ***(Millikan, 200****3).*

With a move to the tension-free repair following the introduction of the meshes, results improved with a dramatic decrease in the rate of recurrence to approximately 10% ***(Millikan, 2003).***
Primary suture repair of incisional hernia results in 3*1-58%* recurren***ce(Clark et al., 2006)***

Several techniques have been advocated to implant the mesh:
(1) Onlay or epifascial.
(2) Sublay,underlay or retromuscular.
(3) Inlay ;within the defect .
(4) Intraperitoneal.
The onlay method may be complicated by wound infections, while intraperitoneal mesh leaves the potential for development of enteric fistula or small bowel obstructions. ***(Hamilton et al.,2005).***

The sublay prosthetic hernioplasty, which was introduced in the 1970 by the French surgeons Stoppa and Rives, became one of the widely accepted procedures for incisional hernia repair. This technique is basically characterized by mesh implantation in the"sublay"position below the rectus muscle and fixation of the mesh by transfascial sutures at the edges of the mesh ***.(Petresen et al., 2004).***

In 1993, LeBlanc et al., were first to report the laparoscopic repair of an incisional hernia. Since then laparoscopic incisional hernia repairs have become increasingly popular because of the demonstrated decreased hospital stay, decreased complication rates, and lower recurrence rates, ***(Rudmik et al., 2006).***

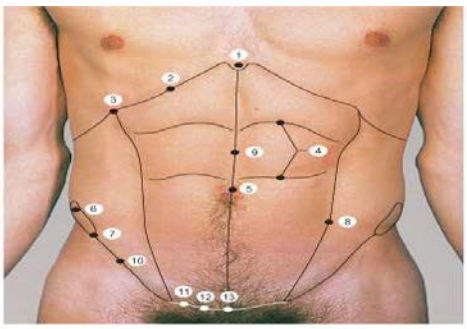
The laparoscopic approach to incisional hernias is based on the open tension-free mesh repair technique, in which a large prosthesis is placed deep to the rectus abdominus in the preperitoneal space to overlap the defect by several centimeters in all directions, ***(Motson et al., 2006).***

Laparoscopic surgery carries well-documented advantages over open methods: decreased postoperative pain and hence lower analgesia requirements, decreased inpatient hospital stay, earlier return to work, and improved cosmosis. These advantages suggest that laparoscopic surgery lends itself to the day case setting. The need for inpatient analgesia and specialist nursing is negated, and patients are ambulatory at a much earlier stage**,** ***(Engledow et al., 2007).***

Chepter 1
ANATOMY OF THE ANTERIOR ABDOMINAL WALL

External anatomy:

Anterior abdominal wall extends from the costal margins and xiphoid process superiorly to the iliac crests, pubis and pubic symphysis inferiorly. It overlaps and is connected to both the posterior abdominal wall and Para vertebral tissues. It forms a continuous and flexible sheet which cross the anterior and lateral aspects of the abdomen. The anterior abdominal wall is composed of the integument, muscles and connective tissue lining the peritoneal cavity **(Fig. 1)**. It has an important role in maintaining the form of the abdomen and is involved in many physiological activities. Anterior abdominal wall tissues form the inguinal canal that connects the abdominal cavity to the scrotum in men or labia majora in women, and also form the umbilicus both of these sites are of considerable clinical importance. ***(Devlin and Kingsnorth, 1999).***



Fig(1) : External anatomy of anterior abdominal wall

Subcutaneous layer of the anterior abdominal wall:

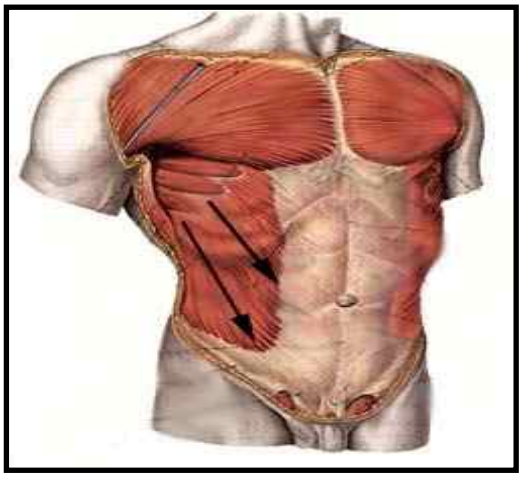
Beneath the skin, there is the subcutaneous areolar tissue and fascia. Superiorly, over the lower chest and epigastrium, this layer is generally thin and less organized than in the lower abdomen where it become bilaminar, being formed of:-
(1) Superficial fatty stratum (camper's fascia).
(2) Deeper, stronger and more elastic membranous layer (scarpa's fascia). ***(Frank, 2005).***

The superficial layer is thick, areolar, and contains variable amount of fat. In males, this layer continues over the penis, spermatic cord and scrotum, and contains non striated muscle fibres, called the dartos muscle. This layer continues into the remaining perineum and in females, it continues over the labia majora.The deep layer is more membranous and contains elastic fibres. It is separated from the underlying muscle (external oblique) by a loose areolar layer. It is thickened and prolonged on the dorsum of the penis. Inferiorly, it fuses with the deeper structures (deep fascia of the thigh, medial part of the inguinal ligament, and pubic tubercle) along the line of the fold of each.***(Peter et al, 2005).***

Muscles of the anterior abdominal wall:

These are arranged in three layers, each of which is muscular posterolaterally and aponeurotic anteromedially. They are separate in the flanks, where they are known as the external oblique, internal oblique and transversus abdominus muscles. The layers fuse together venterally to form the rectus sheath.

The external oblique muscle:



Fig(2): External oblique muscle

The external oblique muscle arises by eight digitations from the external surfaces of the lower eight ribs. The fibers pass downward and forward from their origin; the posterior fibers are nearly vertical and are inserted into the anterior external lip of the iliac crest**(Fig. 2)**. In contrast, the uppermost fibers run almost horizontally towards the contralateral side.All the superior and intermediate fibers end at the strong external oblique aponeurosis. Superiorly, the aponeurosis is

relatively thin and passes medially to be attached to the xiphoid process. Inferiorly, the aponeurosis is very strong and forms the inguinal ligament at its lower margin. Midway, the aponeurosis of the muscle forms the anterior rectus sheath and is inserted along with its fellow of the opposite side into the linea alba and front of the pubis. ***(Devlin and Kingsnorth, 1999).***

The internal oblique muscle:

Fig(3) Internal oplique muscle

The internal oblique muscle arises from the lateral half of the abdominal surface of the inguinal ligament, the intermediate line of the anterior two thirds of iliac crest and lumbodorsal fascia. The general direction of the fibers is upward and medial **(Fig. 3).** The posterior fibres are inserted into the inferior border of the cartilages of the lower four ribs. The intermediate fibers pass upward and medially and end in a strong aponeurosis which extends from the inferior borders of the seventh and eighth ribs and xiphoid process to the linea alba throughout its length. The lower fibers, arising from inguinal ligament, arch downward and medially with the lowest fibers of the transversus muscle then pass

infront of the rectus muscle forming the anterior rectus sheath and insert on the pubic crest and iliopectineal line behind the lacunar ligament and the reflected part of the inguinal ligament.***(McMinn, 1995).***

The transversus abdominis muscle:

The muscle arises from the iliopsoas fascia along the internal lip of the anterior two thirds of the iliac crest and the costal cartilages of the lower six ribs interdigitating with the origin of diaphragm. Anteriorly, the muscle fibers end in a strong aponeurosis which is inserted into the linea alba, pubic crest and the iliopectineal line **(Fig. 4).** Most of the fibers run transversely, but in the lower abdomen, they curve downward and medially so that the lower margins of the muscle forms arch over the inguinal canal. The lower fibers give way to the aponeurosis, which gains insertion into the pubic crest and the iliopectineal line. ***(Devlin and Kingsnorth, 1999).***

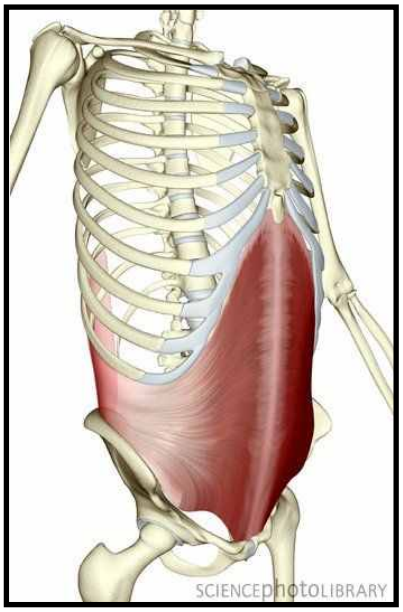


Fig (4) Tranversus abdominis muscle