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Objectives

1. Discuss anterior abdominal nerve block
2. Discuss hematoma of rectus sheath
3. Describe the anatomy for paracentesis of the abdomen (Enumerate in order the layers of anterior abdominal wall, penetrated by the cannula, both in the mid-line and in the flank lateral to inferior epigastric vessels).

4. Identify the clinical anatomy for the different abdominal surgical incisions.

Anterior abdominal nerve block

Area of anesthesia : The skin of the anterior abdominal wall.

- The nerves of the anterior and lateral abdominal walls are the anterior rami of the 7th to 12th thoracic nerves and the 1st lumbar nerves (ilioinguinal and iliohypogastric).

Indications : It is performed to repair lacerations of the anterior abdominal wall.

Procedure :

- At the anterior ends of intercostal space, the intercostal nerves T7 to T11 enters the abdominal wall by passing posterior to the costal cartilages.

- An abdominal field block is most easily carried out along the lower border of the costal margin and then infiltrating the nerves as they emerge between the xiphoid process and the 10th or 11th rib along costal margin.

- **Ilioinguinal nerve:** It passes forward in the inguinal canal and emerges through the superficial inguinal ring.

- **Iliohypogastric nerve:** It passes forward around the abdominal wall and pierces the external oblique aponeurosis above the superficial inguinal ring.

- The two nerves are easily blocked by inserting the anesthetic needle 1 in. (2.5 cm) above the anterior superior iliac spine on the spinoumbilical line.

Hematoma of the rectus sheath

- It is uncommon but important.

Site: It occurs most often on the right side below the level of the umbilicus.

Source of bleeding: It is the inferior epigastric vein or, more rarely, the inferior epigastric artery.

Cause of bleeding:

- The cause is usually blunt trauma to the abdominal wall.
- The vessels may be stretched during severe coughing or in the later months of pregnancy, which may predispose to the condition.

Symptoms : - History of trauma.

- Midline abdominal pain.

Signs: - An acutely tender mass confined to one rectus sheath is diagnostic.

Paracentesis of the abdomen

- It is the withdrawal of the excessive collections of peritoneal fluid (ascites).

Causes of ascites: - It is secondary to cirrhosis of the liver.

- Malignant ascites secondary to advanced ovarian cancer.

Anesthesia: It is done by local anesthesia .

Procedure: - The needle or catheter is inserted through the anterior abdominal wall.

- The underlying coils of intestine are not damaged because they are mobile and are pushed away by the cannula.

A. If the cannula is inserted in the midline:

- It will pass through the following structures:

1- Skin **2-** Superficial fascia: Fatty and deep membranous layer.

3 - Linea alba. **4 -** Fascia transversalis.

5 - Extraperitoneal fatty tissue.

6 - Parietal peritoneum.

B. If the cannula is inserted in the flank: (lateral to the inferior epigastric artery and above the deep circumflex artery)

- It passes through the following structures:

1 - Skin. **2-** Superficial fascia: Fatty and deep membranous layer.

3 - Aponeurosis or muscle of external oblique, internal oblique muscle and transversus abdominis muscle.

4 - Fascia transversalis.

5 - Extraperitoneal fatty tissue.

6 - Parietal peritoneum.

Surgical incisions

Definition: It is the incision through the anterior abdominal wall to expose the underlying viscera.

Length and direction of incision: It depends on the direction and position of the nerves and muscles of abdominal wall.

- The incision should be made in the direction of the lines of cleavage in the skin.

- Cutting of segmental nerves result in paralysis of part of anterior abdominal musculature and a segment of the rectus abdominis.

The following incisions are commonly used:

1. Paramedian incision: - It is supraumbilical for exposure of the upper part of abdominal cavity.

- Infraumbilical for the lower abdomen and pelvis.

- In extensive operations in which a large

exposure is required, the incision can run the full length of the rectus sheath.

2. Pararectus incision: The incision is parallel to the lateral margin of the rectus muscle. **Disadvantage:** The opening is small and any longitudinal extension requires that one or more segmental nerves to the rectus abdominis will be damaged with resultant postoperative rectus muscle weakness.

3. Midline incision: It is done through the linea alba.

- It is a rapid method of gaining entrance to the abdomen.

Advantage: It does not damage muscles or their nerve and blood supplies.

- It may be converted into a T-shaped incision for greater exposure.

4. Transrectus incision: It is longitudinal incision through rectus abdominis muscle.

Disadvantage: Cutting of the nerve supply to the medial part of the muscle.

5. Transverse incision: It can be made above or below the umbilicus and can be small or so large that it extends from flank to flank.

- It can be made through the rectus abdominis muscle, oblique and transversus abdominis muscles.

Advantage:

1. It is rare to damage more than one segmental nerve so that postoperative abdominal weakness is minimal.

2. The incision gives good exposure and it is tolerated by the patient.

6. Subcostal incision (Kocher incision) : It starts

in the midline 2-5 cm below the xiphoid processes

and extends parallel to the costal margin.

- It is used in gallbladder, biliary tract and spleen operation.

Advantages: 1. Greater lateral exposure
2. Less post-operative complications.
3. Good healing.

Disadvantages: Longer operation time.

7. Pfannenstiel incision: A convex 12 cm incision,

located at the suprapubic skin crease about 5cm

above the symphysis pubis.

- It is used for lower GI and reproductive organs.

Advantages: - It decreases the post-operative muscle paralysis.

- It also follows the cleavage lines in the skin resulting in less scarring.

Disadvantages: - Limited exposure of the abdominal organs.

- High risk of injury to the bladder.

8. McBurney's incision. This is used for appendectomy.

- The incision is made in the right iliac region about 2 in. (5 cm) above and medial to the anterior superior iliac spine.

- In case of doubt about the diagnosis of appendicitis, an infraumbilical right paramedian incision should replace it.

Disadvantage: It gives a limited exposure.

9. Abdominothoracic incision (A): It is used to expose the lower end of the esophagus

Ex: Esophagogastric resection for carcinoma of this region.