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Clinical Evaluation of Abdominal Wall Hernias

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Abstract

Hernia is defined as protrusion of a viscus or part of a viscus through a weakening or defect in the wall of its containing cavity. Areas of potential anatomical weakness includes inguinal canal, femoral canal, linea alba, umbilical scar, as well as acquired surgical trauma. The weakening/defect may be acquired (like surgical scar) or congenital (like deep inguinal ring). Raised intraabdominal pressure is the most important factor that leads to the development of hernia through the weak areas. Clinically, the hernia usually presents with an abdominal swelling that progresses gradually over time. The sites of hernia are characteristic and usually points towards the diagnosis. While evaluating a hernia clinically, it is important to identify the content of the hernia sac and whether it suffers any complication, as well as the cause of the hernia development. Failing to identify these prior to surgery, will likely result in morbidity as well as recurrence. This chapter will focus on the clinical art of history taking and examination of different abdominal hernias.

Keywords: Hernia, abdominal, clinical evaluation

1. Introduction

The abdominal wall hernia is a protrusion of an abdominal viscus or a part of a viscus through a weakness or defect in the wall. The defect may be congenital like deep inguinal ring and umbilical scar or acquired like incisional scar. The most important factor contributing to the development of hernia is the high intraabdominal pressure, first stretching the weakened area and ultimately giving way to the hernia sac. High intraabdominal pressure may result from chronic cough, straining at micturition or defecation, heavy weight lifting, pregnancy and intraabdominal malignancy. Smoking has a dual role in hernia development, contributing to chronic cough from bronchitis and muscular weakness from acquired collagen deficiency.

The clinical diagnosis of abdominal hernia is usually clear. It may be reducible and uncomplicated or irreducible with complication like obstruction, strangulation or inflammation. However, during clinical evaluation, it is important to identify the cause of hernia development, so as to address this, otherwise recurrence will be likely. It is also important to identify the content of hernia sac, as patient may develop a complication of it. The most common contents are omentum and small bowel; however, large bowel, appendix, Meckel's diverticulum, ovary, fallopian tube and urinary bladder can also occupy hernia sac, or form part of the sac as in sliding hernia.

The common varieties of abdominal herniae are inguinal, femoral, umbilical, epigastric and incisional, while obturator, lumbar, gluteal and Spigelian hernias [1] are rarer. Inguinal hernia has two varieties, direct and indirect. Direct inguinal hernia comes out through the medial half of weak posterior inguinal canal wall and then becomes superficial through superficial inguinal ring. Indirect (oblique) inguinal hernia comes out through the deep inguinal ring, traverses the inguinal canal and becomes superficial through the same superficial inguinal ring. It can occur as congenital inguinal hernia due to persistence of processus vaginalis; though congenital, it is not necessarily present at birth and may appear first time in adult life with hernia reaching to the bottom of scrotum at first appearance. Inguinal hernia is referred to as complete, when it reaches the bottom of the scrotum. The femoral hernia comes out through the femoral ring, traverses the femoral canal and becomes superficial through the saphenous opening. The umbilical hernia in infants is through the weak umbilical scar, whereas in adults it is through the linea alba just above (supraumbilical) or just below (infraumbilical) the umbilicus. The epigastric hernia occurs through the linea alba anywhere between xiphoid process and umbilicus, usually midway between these structures.

2. History taking in abdominal hernia

About 75% of all abdominal wall hernias occur in the groin area [2]. There are some age and sex characteristics. Indirect inguinal hernia usually develops in young adults, whereas direct inguinal hernia and umbilical hernia in middle aged and older patients. Inguinal hernias are more common in males (9:1 male predominance) [3] whereas femoral hernias are more common in females (4:1 female predominance) [4].

The lump is the most common complaint, with the patient noticing a swelling in one or more of the anatomical locations of hernia. It may start spontaneously as in congenital hernia or follow some abdominal straining activity as in acquired hernia. The anatomical site of first appearance is important, i.e. umbilicus, inguinal canal or femoral canal (below the groin crease). An inguinal hernia may reach the bottom of scrotum on its first appearance, indicating a congenital hernia developing into a preformed sac. However, the usual history is of a small swelling appearing, which gradually increases in size over time (acquired hernia). A hernia may or may not reduce on lying down; direct inguinal hernia reduces automatically as soon as the patient lies down, whereas indirect inguinal, umbilical and incisional hernias either reduce slowly itself or has to be reduced manually. Femoral hernia usually can't be completely reduced.

The pain is the second important complaint. It tends to occur at some specific points in the hernia history. First, it occurs in the very beginning when there is tendency to hernia, when the patient complains of a dragging and aching type of pain which gets worse as the day progresses; this pain is due to stretching of the hernia ring and it ceases once the ring becomes fully dilated so as to pass the sac [5]. Pain may worsen by activities that increase intraabdominal pressure like coughing, laughing, lifting or straining, as more of the abdominal content are pushing through the defect [5]. Later, the pain occurs when hernia content develops some complication like strangulation, obstruction or inflammation. Groin pain, without any obvious bulge, can also occur in young athletes due to overuse injury associated with adductor muscles and tendons [6, 7]. This is vague unilateral or bilateral groin pain, usually occurs on exertion and may radiate to the scrotum and medial thigh [7]. This represents sports hernia, a misnomer, not a true hernia, with a weakness of the posterior wall of the inguinal canal [7].

Finally, the patients may have some symptoms indicating the cause of hernia or a complication. So, the patients may have persistent cough of chronic bronchitis, chronic constipation or prostatism of benign prostatic hyperplasia. Similarly, patients may have cardinal symptoms of intestinal obstruction, i.e. colicky abdominal pain, abdominal distension, vomiting and absolute constipation. The past history may uncover an abdominal operation like appendicectomy, cholecystectomy or renal surgery.

3. Objective examination of abdominal hernia

The diagnosis of abdominal wall hernia can be made with reasonable accuracy through history and clinical examination. However, imaging modalities like CT scan, ultrasound and MRI can help in difficult or complicated cases. One study reported 75% sensitivity and 96% specificity of clinical examination in hernia diagnosis [8].

3.1 Positioning and exposure

The exposure must include the whole abdomen (and not limiting to just the site of complaint) from the level of xiphisternum to the mid-thigh. This is necessary to avoid missing another hernia, which the patient is not aware of. Remember, the causative factor raised intraabdominal pressure is equally applied to all anatomically weak areas.

The patient should first examine in standing position and the doctor sit in front of him/her, especially if the presenting complaint is suggesting the possibility of hernia. But, if an incidental hernia discovered during abdominal examination, then ask to stand up later. In the end, the patient is examined in lying down position for reducibility and confirming anatomical types.

3.2 Inspection

A swelling may be present or appear when the patient coughs. Note its site, size, shape, extent, impulse on cough and whether any other swelling present in scrotum or elsewhere. The site is characteristic of any abdominal wall hernia. Inguinal hernia lies above the groin crease medially, whereas femoral hernia lies below the groin crease medially. Epigastric hernia lies in the upper part of linea alba, whereas para-umbilical hernia lies in the linea alba adjacent to umbilicus. Indirect inguinal hernia is typically pyriform-shaped with its stalk at superficial inguinal ring, and extends towards and into the scrotum. Direct inguinal hernia is hemi-spherical shaped and usually don't enter into scrotum. Femoral hernia is ovoid or hemi-spherical shaped, starting below the groin crease and ascends upwards.

The presence of expansile cough impulse is diagnostic of hernia. However, it may be absent in cases of complication like obstruction/strangulation, when neck of the sac is blocked by adhesions, preventing additional viscera to enter hernial sac on coughing. Conclude the inspection by examining the skin overlying hernia and skin of penis and scrotum. Any redness is an indication of complication like inflammation and strangulation.

3.3 Percussion and auscultation

These are useful to confirm the characteristics of hernial content. The percussion will give a resonant note if the hernia contains bowel (enterocele), and a dull

note if it contains omentum (omentocoele). Similarly, auscultation will confirm the presence of gut if bowel sounds are there. Additionally, tenderness can be revealed on percussion, if the content is inflamed or in cases of strangulation.

3.4 Palpation

This includes palpation of the swelling, as well as scrotum and its contents (especially if the swelling is entering scrotum) and the penis and urethra. Begin with confirming the inspection findings of expansile cough impulse, as well as confirm the anatomical site and extent, and size, shape and surface. Note the temperature and tenderness; raised temperature and positive tenderness will be found in strangulated hernia. The consistency is peculiar of the content; doughy in omentocoele and elastic in enterocoele. In suspected sports hernia, tenderness may be found on palpation over pubic symphysis and/or pubic tubercle and over superficial inguinal ring [7].

The test, “get above the lump”, helps in differentiating a hernial swelling and a true scrotal swelling. The neck of the scrotum is hold on both sides, while feeling the structures in this area. If only the spermatic cords are felt and the swelling is below, it is true scrotal swelling. If the neck structures are thicker than the spermatic cord and the swelling is going up, it is either a hernia or congenital hydrocele. Gently pull the testis down, “traction test”; it may reveal encysted hydrocele of cord as it descends. Fluctuation and translucency tests will help in further defining the content of a scrotal hernial swelling and a true scrotal swelling like hematocele and hydrocele. The finger invagination test [5], consist of doctor invaginating his/her index finger into the canal through the root of scrotum and feeling the expansile impulse while the patient cough or do Valsalva maneuvers; however, I discourage performing this test as it is painful for the patients and doesn't add much to the diagnosis.

The final parts of palpation are done while the patient is lie down on the bed. The hernias with wide neck such as direct inguinal hernia or incisional hernia, usually reduces itself as the patient lie down. In long standing indirect inguinal hernia or paraumbilical, the patient usually knows how to reduce it. Ask them to reduce. If patient is unable to reduce, then ask to relax the abdominal muscles and hold the fundus of the sac, while applying constant gentle pressure, squeezing the contents towards the abdomen. The contents may reduce with gurgling (enterocoele). Note the difficulty in reduction; in enterocoele the first part is difficult to reduce but the last part goes in easily, while in omentocoele first part reduces easily while the last part reduces with difficulty. However, in cases of complication like strangulation, a hernia can't be reduced. Never try to force reduction, as it may result in rupture of sac.

Ring occlusion test is a useful test to differentiate between a direct and an indirect inguinal hernia. The hernia must be reduced first. Begin by palpating the inguinal ligament and tracing it medially and laterally towards its bony attachments, pubic tubercle and anterior superior iliac spine, respectively. Locate the deep inguinal ring which lie 1.25 cm above the inguinal ligament midway between its two bony attachments. Occlude the deep inguinal ring with thumb and ask the patient to cough. If hernia comes out while the deep ring is occluded, it is direct inguinal hernia.

3-finger test is a similar test which helps in differentiating indirect inguinal, direct inguinal and femoral hernias. Here 3 rings are occluded simultaneously with 3 fingers; index finger on deep inguinal ring, middle finger on superficial inguinal ring (about 1.25 cm above the pubic tubercle) and ring finger over saphenous opening (about 4 cm below and lateral to pubic tubercle). The patient is asked to cough.

The expansile impulse at index finger indicates indirect inguinal hernia, middle finger indicates direct inguinal hernia and ring finger femoral hernia.

It is useful to examine the tone of abdominal muscles by asking to raise shoulders against resistance or lift both legs straight off the bed. This will also show a divarication of recti.

Finally, it is important to remember that local hernia examination must be supplemented by full abdominal and digital rectal examinations, as well as any other system if history is suggesting.

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