RARE TYPES OF HERNIA

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RARE TYPES OF HERNIA (Abstract): Depending on their origin hernias are classified into congenital and acquired, the latter occurring in people in which the respective hernia area is fully developed but is weak or weakens under the complex action of etiological factors. The development of hernia is the result of the imbalance between two constantly acting forces: positive intra-abdominal pressure and contraction of abdominal muscles which by their tonicity keep the viscera in place. The correct diagnosis and early treatment are keys to successful repair. **Material and methods:** This study analyses the clinical and laboratory findings and therapy response in 13 patients with hernia. The sample is representative for this condition, and the cases have been selected based on the acutization of inflammatory phenomena. **Results and discussion:** In the treatment and management of these rare hernias the fact that they are prevalent in the elderly with significant weight loss and associated chronic conditions has to be considered. **Conclusions:** These types of hernia have a precise anatomic identity; their onset is favored either by an inherited abdominal wall defect, or acquired by multiparity and physical strain. **Keywords:** STRANGULATION, PAIN, HERNIAL OCCLUSION, SURGICAL TREATMENT.

Hernias have been known since ancient times when simple methods were used for their repair (1, 2). Reducible hernias were supported with the help of a strap or bandage, whereas strangulated hernias were treated with palliative means (diet, rest, purgatives, astringent compresses/poultices, bleeding, massage) (1, 3).

A more rational treatment was used by Phoenicians, 900 years B.C. The first man to perform surgeries for hernia repair was Celsus (100 AD.); surgery consisted in the ligature and excision of the hernial sac without opening it. Heliodorus (second century A.D.) was the first to isolate the inguinal hernia sac from the cord, while Oribasius (fourth century) performed the ligature and excision of the freed sac followed by cauterity of surrounding tissues. (1). In Middle Ages, the Arab surgeons Haly Abbas (930-994), and Avicenna (980-1037) frequently practiced surgery to treat hernias (1).

The 19th century marks the beginning of modern hernia surgery, famous monographs, such as those by Cooper and Scarpa, being published (1).

Despite the fact that people have started to lose confidence in surgery due to the abusive practice of castration, suppurations and relapses, in order to rehabilitate the surgical art, numerous authors strived to
find better treatment procedures (3).

The breakthrough in hernia therapy was the discovery of antiseptics, which resulted in less postoperative infections and thus encouraged more surgery.

MATERIAL AND METHODS

The study included 13 patients, study group representative for this condition. The cases were selected based on the acutization of inflammatory phenomena, and were admitted in the interval 2005-2010 to the General Surgery Department of the Iasi Railroad Hospital. The data collection process was followed by data processing and interpretation, using 95% confidence intervals; for differences $\chi^2$ and t-Student tests were used. In the end, the data were centralized in the epidemiologic systems Excel and SPSS 13.0.

RESULTS

Rare hernias include Spigelian, obturator, lumbar, ischiatic, and perineal hernias.

Our study included: 5 (38.46%) cases of Spigelian hernia, 4 (3.76%) cases of obturator hernia, 3 (23.07%) cases of perineal hernia, 1 (7.69%) case of lumbar hernia, and no case of ischiatic hernia (fig.1).

Spigelian hernia (or lateral ventral hernia) is a rare abdominal hernia through a congenital or acquired defect in the aponeurosis of the transverse abdominal muscle limited by the semilunar line (or Spigelian line) laterally and the lateral edge of the rectus muscle medially. The semilunar line is in fact an aponeurotic line located between the muscle mass of transverse abdominal muscle and the flashy mass of the large abdominal muscles. In its upper part it is narrow and solid, but in the lower part it progressively widens, being visible (fig. 2).

![Fig. 2. Deep orifice of Spigelian hernia (collection of the clinic)](image)


The weak point of the aponeurotic fascia is located at the intersection of the spinal-umbilical line with the lateral margin of the rectus abdominis and it corresponds to the arcuate line of Douglas, where the peritoneum contacts the interstitial space of the aponeurosis of the transverse muscle, or even the space between the internal oblique
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and the transverse muscle; here, the fibers of the two deep major muscles are parallel, they do not meet in order to strengthen the wall. There are high Spigelian hernias, near Douglas’ arcuate line, and Spigelian hernias which can be mistaken for inguinal hernias. This type of hernia is acquired, usually unilateral, and may contain omentum, intestine or colon.

Clinical examination detects the parietal character of the formation presenting the features of a hernia: pain, irreducibility, expansion, impulsion on cough. The diagnosis is based on clinical and laboratory findings; once diagnosed, the surgical treatment is necessary; because strangulations are frequent, the removal of hernia sac and closure of the inguinal orifice are required. The surgical approach may be classical, direct, or laparoscopic.

Of the 13 studied cases 5 (38.46%) presented Spigelian hernia located at the lateral margin of the rectus abdominis muscle, underneath and outside the umbilicus on the line that unites the anterior superior iliac spine and the umbilicus. The deep orifice where the hernia sac is engaged is located in the anterolateral fascia of the abdomen under Hesselbach triangle and above the epigastric artery, which ascends obliquely inwards, behind the transverse fascia and then in front of Douglas’ arcuate line. The content of hernia sac is a thin loop of sigmoid, colon, cecum, and vermiform appendix. Due to the fact that the hernia orifice was usually small and had fibrous wall in 4 (30.76%) out of 5 cases, occlusive phenomena occurred, with paroxysmal abdominal pain, vomiting, Koenig’s sign, absence of bowel movements, and poor general health status.

Hernias were repaired in all 5 cases via indirect paraumbilical medial approach, repairing the abdominal wall (1 case - 7.69%); the classic, direct, hernial approach was used in 3 cases (23.07%); the medial and paraumbilical approach was used in 1 case (7.69%).

A special mention deserves the case of the patient admitted one year earlier for a mass in the left iliac fossa the size of an orange and increasing in size during physical exercise; the mass was more visible in orthostatism and smaller in supine position. Personal history included multiparity and a uterine fibroma, surgically removed when the patient was 34 years old.

During local examination in orthostatism, we noticed that the patient presented on the bispinal line an approximately 2/3 cm mass expanding during physical exercise. The clinical examination did not reveal anything special.

The intraoperative diagnosis was of left Spigelian hernia; we used the Bautheley technique; it revealed a hernia duct the size of an orange, containing a fragment of sigmoid colon attached to the bottom of the sac. The neck of the hernia sac crossed the muscle part of the transverse abdominis muscle. The hernia sac was resected together with the serrated sigma, then the wall was repaired with catgut. We closed the hernia gap by fastening the Douglas arcuate line at the external margin of the left rectus abdominis muscle. The anatomic plans were remade. Above, we fastened the aponeurosis of the oblique muscle in the vest. The patient was discharged from hospital clinically cured.

Obturator hernia occurs through the obturator groove situated between the obturator membrane and the horizontal branch of the pubis, a groove through which the obturator package passes from pelvis towards the thigh. The hernia sac is engaged
in this groove, and, depending on its progress, there are three anatomical-clinical forms: - interstitial hernia, in which the sac and the groove do not extend the obturator groove; recto-pectineal hernia, in which the cul-de-sac extended the groove and reached the thigh under the pectineus muscle; and the pre-pectineal hernia, in which the sac superficially reaches the cribriform fascia. The sac is thin and it may contain intestine, omentum, tube, or ovary. Obturator hernia is more frequent in frail elderly women with changes of the pelvis (figs.2,3).

Clinical obturator hernia is characterized by pain at the inner side of the thigh and the knee due to the compression of the obturator nerve. When it exceeds the obturator groove, we can palpate a tumoral formation at the root of the thigh, which is irreducible, unpainful, located near the obturator groove. Most commonly the diagnosis is made intraoperatively, when the surgeon repairs a mechanical bowel occlusion of unknown causes. A strangulated obturator hernia is a surgical emergency. The approach can be transperitoneal in complicated forms of occlusion, femoral or pro-peritoneal inguinal. The repair of hernia consists in exposing the sac, opening it, reducing the viable contents or resection in case of occlusion with necrosis and closure of the defect, which can be done with mesh.
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**Fig. 4.** Revealing the strangulated loop, engaged in the obturator groove. Reduction. (Collection of the clinic).

*Special Note* related to patient S. S., 60 years old, hospitalized for abdominal cramps, nausea, repeated episodes of vomiting, absence of bowel movements and flatulence.

The patient presented several years earlier pain at the root of the right thigh, radiating towards the knee, more intense in physical strain and which involved a certain degree of functional discomfort. Due to the fact that the pain exacerbated, also the general state of the patient worsened. We chose subumbilical medial laparotomy.

Parts of the intestinal loops were dilated, and during exploration we noticed the fastening of a terminal loop on the right lateral wall of the pelvis. In Trendelenburg position, it is easy to reveal a “barrel gun” loop in the subpubic groove. It was possible to reduce it only after the digital enlargement of the abdominal orifice. Only few centimeters of the intestine were involved and it was not compromised. The orifice was closed using the peritoneal fold technique. The patient was discharged healed.

**Perineal hernias** are rare, being caused by parietal defects of the pelvic floor; they are more frequent in women, and can be medial and lateral. Medial hernias are muscular-aponeurotic in women, favoring the externalization of the pouch of Douglas through the posterior vaginal wall. The vaginal and rectal examinations reveal a soft, reducible mass, larger on cough. Bilateral perineal hernias are located in the anterior perineum in women, and in the posterior ones in both genders. Anterior lateral hernia crosses the pelvic floor in women and exists through labia, while the posterior lateral hernias cross the levator ani and reach beneath the gluteus like ischiatic hernias. The diagnosis is clinically suspected and confirmed by tomodensitometry. The treatment is surgical and it consists of identification and treatment of the sac, repair of the wall by transperitoneal approach for medial hernias, as well as perineal and mixed approaches (fig.5).

**Fig. 5.** Perineal hernias (collection of the clinic).

1. Medial perineal hernia - hydrocele;
2. Medial perineal hernia - elytrocele;
3. Lateral ventral pudental or labial perineal hernia;
4. Dorsal lateral perineal hernia.
5. Levator ani; 6. Ischiococcygeus muscle.

Perineal hernia incorporates in its structure 3 cases (23.07%) out of the 13 cases included in this study. The hernia orifice is found in the soft parts of the pelvic floor.

*Special note* concerning patient P.S. 39-year-old, hospitalized for a mass the size of an apple, painful, with limited consistency, reducible, accompanied by intestinal gurgling, pulsating on cough. The patient complained of a feeling of intense perineal pressure, with discomfort during walking, sitting
or defecation, pain or cramps. The hernia contained vesical structures, with particular symptoms (dysuria, pollakyuria, miction) or frequent urination. The treatment is surgical, with perineal approach. The patients is cured and released from hospital.

Another mention refers to patient M. M., 34 years old, hospitalized for an ovoid, unpainful, irreducible mass located on the posterior vaginal wall. The patient was a multiparous woman, the last childbirth being laborious. After the last childbirth, the patients felt permanent pelvic pain. After a few months, she noticed the occurrence during exertion of a small, soft, and reducible mass at the level of the pudendal cleft; in time, the mass increased in size.

During the local orthostatic examination, we noticed a prominence of the posterior wall of the vagina, forming a reducible tumor of the size of a pigeon’s egg. In gynecologic position, we noticed that the vulvar orifice is half opened, with a posterior vaginal hernia on the posterior wall of her vagina, a smooth, stretched and shiny mucosa; at palpation, it felt soft and reducible; during vaginal examination we noticed a lax posterior vaginal wall and free vaginal cul de sac; during mixed examinations, we noticed that the fingers are separated by the thickness of the tumor. After reduction of the tumor, we noticed that the fingers are separated only by the rectovaginal septum, with deficient levator ani.

We applied a surgical perineal intervention; we split the posterior vaginal wall and we reached to a cystic formation, partially reducible, prolonging upwards to a diverticulum between the rectum and vagina. This pedicle is sectioned after the ligature. We performed a colpoperineorrhaphy. There was a good postoperative evolution.

The cystic formation contained a whitish fluid. The histologic examination showed that its internal facet presented a serous epithelium that looked like the peritoneal serous membrane, doubled by a lamellar coating of connective tissue.

**Lumbar hernia** can be congenital, post traumatic or due to lumbar, lumbosacral and iliac crest abscesses, areas in which there are two weak points of the inferior abdominal-lumbar wall.

One variety of hernia is produced by lumbar-abdominal denervation or relaxation, because of parietal paralysis of oblique muscles after urologic interventions affecting the last two intercostal nerves. The clinical examination in orthostatic position revealed a painful and reducible mass in the lumbar area, pulsating on cough. It naturally grows, with a high risk for strangulation. The differential diagnosis includes lipoma or other tumors of the area. The clinical diagnosis can be confirmed by imaging investigations, ultrasound, CT, etc. The treatment is surgical and consists in an incision over the mass site, detection and reduction of the sac, replacing its contents and repairing the abdominal wall (fig.6).

![Fig. 6. Treatment of lumbar hernia. Dowd procedure: A. vertical incision; B. bringing the muscle fascicles closer; C. suture of margins; D. creating the second flap. (Collection of the clinic).](image-url)
In small hernia, the plain muscular-aponeurotic suture can close the parietal defect. In large hernias, the preperitoneal placement of a prosthetic mesh is required.

In our study, only 1 (7.69%) of the 13 cases had lumbar hernia.

**Ischiatic hernias** are exceptionally rare and they are produced by parietal defects located at the level of the ischiatic notches, between the muscles and ligament formations. There are three anatomoclinical forms of ischiatic hernias: suprapyramidal, the most common, subpyramidal, both supraspinous and infraspinous, developing between the greater and lesser sacrosciatic ligament. The diagnosis is difficult, and it is usually made due to strangulation, when the patient experiences pain along the course of the sciatic nerve and signs of bowel obstruction. The treatment is surgical and the transperitoneal or gluteal approaches are used (4, 8).

**DISCUSSION**

Our study supports that the main cause of rare hernias is strain, rarely sudden and violent, usually less intense, but repeated, especially in a certain position of the body.

Under the influence of strain, the pressure in peritoneal cavity increases, with visible effects. The peritoneum forms initially a small diverticulum, in an area of the wall with a limited resistance and then, under the influence of repeated increases of pressure, the diverticulum widens the parietal orifice, like a “ram head” (5).

All the presented cases of the clinic point to the reduced incidence of these types of hernia. In all studied cases, hernia was highlighted only in middle-aged women (3 cases in women under 50 years), which made or make physical strain, with hypotonic abdominal wall, lax, altered by many pregnancies. These rare types of hernia may be accompanied by obvious weight loss or obesity. Cooper (6) reports a vascular hernia that shows that the hernia crosses over along a ram of the inferior epigastric artery, deep circumflex iliac artery or of greater or lesser abdominal-genital nerves. Mayer-Wildisen and Quevrain (8) ascribe the spontaneous break of lateral abdominal wall to a muscular, neurogenic insufficiency and paralysis.

Related to **Spigelian hernias**, we could individualize two clinical pictures: a) spontaneous or provoked pain, intense or dull, accentuated by coughing while strain, sub- and paraumbilical, at the external margin of the straight muscle (2 cases); b) in three cases, the reason for hospitalization was a progressive tumor mass, of variable size, located in the right iliac fossa in 2 cases and in the left iliac fossa in 1 case, at the lateral margin of the rectus muscle, the masses being irreducible (13,15).

In all cases, the mass was unilateral and matte. In one case each, Spigelian hernia was interpreted as postoperative eventration after operated umbilical hernia and as inguinal hernia, and in three cases the correct diagnosis was made postoperatively.

In all our five cases, the clinical picture of Spigelian hernia was not accompanied by occlusive or subocclusive phenomena. Due to the fact that the hernia orifice was deep, at the external margin of the rectus muscle, in the proximity of the penetration point of the epigastric artery in the right abdominal muscle, we chose to use the direct hernial approach. We performed a McBurney incision and we dissociated the fibers of the greater oblique muscle. The hernia sac contained omentum in 2 cases, cecum in one case, sigmoid in one case, and a small sac without contents in another
case. The postoperative outcome was favorable in all cases, as mentioned by other authors as well (3, 8).

In cases of obturator hernias, the diagnosis was made intraoperatively, the clinical picture being characterized by signs of occlusion or subocclusion. The intervention consisted in subumbilical midline laparotomy, during which we noticed an intestinal loop engaged in the obturator groove.

Due to the lesions that arose by strangulation of the intestinal loop in the obturator groove, in all 4 cases segmental enterectomy with termino-terminal suture was performed. In 2 cases the engaged intestinal loop was perforated. The serous citrine fluid was present in the abdomen in 2 cases, and mixed with feces in 2 cases. Fredet, Bonnet, Cottalorda, Lortat-Jacob et al. (11) studied the clinical and therapeutic aspects of obturator hernias.

Due to the complications and the fact that the obturator hernia was diagnosed late in strangulation phase the postoperative outcome was not favorable. Of the 4 cases, 2 patients died within the first 3 postoperative days due to cardiopulmonary arrest, and 2 had a good postoperative outcome. The deceased patients were 60 and 86 years old, respectively. The severity of these hernias was also due to their late detection (occlusion), as well as the complexity of the surgical intervention.

Perineal hernia is the only type of hernia that was diagnosed in our study in relatively younger women, 39 years old. One of the two multiparous women experienced a laborious delivery which affected her perineal muscles. The other woman underwent surgery for umbilical hernia 6 years before she developed perineal hernia. Obviously, this patient was prone to hernias.

In all the 3 cases of perineal hernia the diagnosis was made postoperatively, the outcome being favorable.

Lumbar hernia is the less common of the rare hernias. In Grance’s statistics (quoted by 8), 22 hernias formed via Petit triangle, 8 via Grynfeltt quadrangle, 2 crossed the greater oblique muscle, and 3 were caused by congenital abnormalities in this area.

The presented case was a multiparous woman with intraoperative diagnosis and favorable postoperative outcome.

CONCLUSIONS

Our study highlighted the fact that rare hernias have a precise anatomic identity, while their onset is favored by the relationship between the intra-abdominal pressure and abdominal wall strength.

Rare hernias are an actual concern of emergency surgery, although due to their frequency they are not regarded as priorities. Strangulated hernia, by the brutal, tight and permanent constriction of the contents inside the hernia sac makes the reduction maneuver impossible and very painful.

We pointed out the basics of clinical practice, crucial for making the diagnosis and an optimal surgical indication.

REFERENCES

THE ROLE OF OMICS TECHNOLOGIES IN STAPHYLOCOCCAL INFECTION CONTROL

According to a study by Holtfreter et al, omics technologies (such as genomics, transcriptomics, proteomics, metabolomics and immunoproteomics) are powerful tools that can be used to draw a comprehensive picture of the pathophysiological processes that occur within tissues, organisms and populations and improve the control of some infectious diseases. Thus, omics technologies may contribute to the understanding of the interaction between \textit{Staphylococcus aureus} and the human host and the adaptive immune response. \textit{S. aureus} is an important cause of infection both in hospitals and in the community and many circulating strains have multiple resistance to antibiotics. The humoral immune response was described in detail using immunoproteomics, but T-cell mediated immunity was not yet fully analyzed by omics technologies. Increasing the knowledge of the protection mechanisms can prove useful for the development of new strategies for successful prevention or treatment of \textit{S. aureus} infections and these technologies can speed up vaccine development by enabling reverse vaccinology approaches (Holtfreter S, Kolata J, Stentzel S, Bauerfeind S, Schmidt F, Sundaramoorthy N, et al. Omics approaches for the study of adaptive immunity to \textit{Staphylococcus aureus} and the selection of vaccine candidates. Proteomes 2016; 4(1) pii: E11).