Primary and Unusual Abdominal Wall Hernias

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Primary ventral hernias are abdominal wall hernias that occur spontaneously and are not associated with a fascial scar or related to a trauma. Groin hernias are among the most common primary abdominal wall hernias but are not discussed here. This article covers the various aspects of other common primary hernias and those in unusual anatomic locations, including umbilical, epigastric, Spigelian, lumbar, obturator, supravesical, perineal, and sciatic hernias. Many of these hernias remain a diagnostic challenge for primary health care physicians because of their relative rarity, leading to a delay in presentation and management. In addition, most of them carry a relatively high risk of incarceration because of the frequently associated tight fascial defect.

Hernias are sometimes “unusual” because of the contents of their sacs, such as a Meckel’s diverticulum (Littre’s hernia), a segment of the antimesenteric border of the intestinal wall (Richter’s hernia), or the vermiform appendix (Amyand’s hernia). The clinical characteristics and the management of these hernias are beyond the scope of this article.

**Umbilical hernia**

Umbilical hernias are hernias that occur at the umbilicus. Umbilical hernias can be infantile or adult, based on their onset. The infantile umbilical hernia is a result of an abnormally large or weak umbilical ring in an otherwise normal abdominal wall; the defect is covered by skin. In most children, the umbilical ring progressively diminishes in size and eventually closes. Defects less than 1 cm in diameter close spontaneously by 5 years of age in 95% of cases\textsuperscript{[1]}. However, a ring greater than 1.5 cm in diameter seldom closes spontaneously \textsuperscript{[2]}. 

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The adult umbilical hernia occurs through the umbilical canal, which is bordered by the umbilical fascia posteriorly, the linea alba anteriorly, and the medial edges of the two rectus sheaths on each side [1]. It does not usually result from persistence of infantile hernias, but is acquired in almost 90% of cases and is due to a gradual yielding of the cicatricial tissue that closes the umbilical ring, secondary to increasing intra-abdominal pressure. Predisposing factors include obesity, multiple pregnancies, cirrhosis with ascites, and large abdominal tumors.

Clinical presentation and diagnosis

It is estimated that as many as 10% of all infants are born with an umbilical hernia; the incidence is as high as 20% in African-American infants versus 3% in white neonates, and is increased in association with certain disease states (Beckwith-Wiedemann syndrome, Down’s syndrome) [2]. The incidence of umbilical hernia is also markedly increased in premature babies and may be seen in as many as 75% of infants under 1500 g [2]. There are no significant gender differences. Infantile umbilical hernias are most often asymptomatic and, in contrast to inguinal hernias, rarely incarcerate.

Adult umbilical hernias are more common in women than men and are most likely to occur in the fifth and sixth decades of life. They usually present as a bulge at the umbilicus that is usually asymptomatic but can cause discomfort or pain. Diagnosis is almost always clinical. Complications of umbilical hernias are few, with strangulation, incarceration, or evisceration being reported in 5% of patients in large series [3]. Hernias smaller than 1.5 cm in diameter become incarcerated twice as often as do larger hernias. In cirrhotic patients with ascites, skin ulceration and necrosis may lead to rupture with chronic ascitic fluid leak or peritonitis.

Treatment

Infantile umbilical hernias can be safely managed with observation and usually resolve spontaneously by the time the child reaches 5 years of age. Hernias that are symptomatic, extremely large, or persisting beyond age 5 should be repaired. Most defects can be managed with simple primary closure [2].

Adult umbilical hernias should be surgically repaired as early as possible. The presence of cirrhosis and ascites should not discourage repair, as strangulation, incarceration, and rupture are particularly dangerous in patients with these disorders. Significant ascites, however, should first be thoroughly treated, and nutrition optimized as morbidity and recurrence rate are much higher after hernia repair in these patients.

The modern adult umbilical hernia repair is attributed to William J. Mayo [4], who used the technique of overlapping abdominal wall fascia in a “vest-over-pants” manner. Currently, however, a mesh repair, using either
a mesh plug or a mesh sheet based on the size of the hernia, is favored. In a randomized clinical trial comparing primary suture herniorrhaphy with mesh hernioplasty in 200 adult patients with a primary umbilical hernia followed for 64 months, the hernia recurrence rate was significantly higher after suture repair (11%) than after mesh repair (1%); there did not appear to be a significant relationship between recurrence rate and size of the hernia [5].

In the last decade, laparoscopic ventral hernia repairs have been shown to be safe and effective techniques and have been used for large adult umbilical hernias. In one retrospective comparative study of 32 laparoscopic repairs and 20 open-mesh repairs for umbilical hernias, laparoscopy resulted in shorter operating time, less use of postoperative drains, lower complication rates, and shorter return to normal activities [6]. Laparoscopic repair is an attractive option for umbilical hernias larger than 3 cm in diameter and in recurrent hernias of any size.

Epigastric hernia

Epigastric hernias are hernias of the linea alba occurring between the umbilicus and the xiphoid. Although congenital epigastric hernias have been described in infants [7], they are usually considered an acquired condition.

A number of theories have been suggested to explain the origin and development of epigastric hernias, but controversies still prevail. The first, and most likely, hypothesis links the cause of epigastric hernias to the vascular lacunae that form when the small neurovascular bundles that run between the transversalis fascia and the peritoneum, perforate the linea alba [8,9]. Over periods of increased abdominal tension, preperitoneal fat derived from the falciform ligament is forced along these blood vessels enlarging the fascial defect, and an epigastric hernia is eventually formed. Another hypothesis proposed by Askar [10] and widely quoted relates to an intrinsic weakness in the linea alba fibers. Askar [10,11] noted that the linea alba is formed by the decussation of the tendinous aponeurotic fibers of the muscular layers passing from one side to the other, and that epigastric hernias occur exclusively in patients who had single, instead of triple, anterior and posterior lines of decussation. This finding could not, however, be confirmed by other investigators [12]. Instead, Korenkov and colleagues [12] found that the biomechanical characteristics of the linea alba are not governed by the number of aponeurotic crossings but by the thickness and density of the fibers, and that the weak type of linea alba aponeurosis may be a predisposing factor for the development of a hernia.

About 20% of epigastric hernias are multiple and about 80% are located just off the midline [1]. Fascial defects vary in size from only millimeters to several centimeters. Most epigastric hernias, however, are small and are made up of preperitoneal fat only with no peritoneal sac; these are especially prone to incarceration and strangulation. Frequently, the preperitoneal fat
herniating through this small defect grows over time and becomes chronically incarcerated. Larger hernias with a peritoneal sac most commonly contain omentum, but can contain any upper intraperitoneal organ such as small bowel, colon, or stomach; these hernias seldom incarcerate or strangulate.

Clinical presentation and diagnosis

Epigastric hernias account for 1.6% to 3.6% of all abdominal wall hernias [9] and are three times more common in men than in women. Most of them present themselves between the third to fifth decade of life, with a noticeable drop in incidence after the sixth decade [13]. These findings suggest that epigastric hernias are a condition closely related to physical activity of an individual and not a degenerative disease as in other types of hernia.

Symptoms are related to the defect size and the hernia content. Small hernias typically present with epigastric pain that is usually related to the compression of the neurovascular bundle by the herniated preperitoneal fat [14]. The pain may be associated with an epigastric mass, which can be difficult to palpate in obese individuals. Chronically incarcerated hernias are often confused with lipomas. Most large reducible hernias, on the other hand, are asymptomatic or may cause minimal discomfort. Incarceration produces an acutely painful mass along with symptoms related to the involved organs and their viability.

The diagnosis is usually easy to make on physical examination. Epigastric hernias should be distinguished from diasthesis recti, which is a weakening and broadening of the entire linea alba above the umbilicus. Occasionally, when the diagnosis is uncertain, especially in obese patients, ultrasonography or CT scan may be used to detect the hernia defects.

Treatment

Epigastric hernias, even if asymptomatic, should be repaired at time of diagnosis because of the risk of incarceration. The current literature on the outcome of epigastric hernia repair is scant, given that most are reported as part of series of ventral and incisional hernia repairs.

Most epigastric hernias, especially the small and single ones, and those that are acutely or chronically incarcerated are usually repaired through an open approach. A targeted midline incision is used. The presence of other occult fascial defects should be ruled out as recurrence may be occasionally due to failure to recognize and repair multiple small defects [1]. The preperitoneal fat or hernia sac is reduced or excised without enlarging the defect. If the defects are multiple and contiguous, the fascial bridges between the necks should be left in place if possible—but more often than not, the defects are connected together. The fascia around the defect is often thin and weak, and primary repair is not advised unless the defect is less than 3 mm [14]. A mesh repair is otherwise always performed; adequate options
include an underlay mesh, a mesh plug, or a combination of onlay and underlay mesh [1, 14, 15]. In one series of 57 epigastric hernias ranging in size from 0.5 cm to 5 cm and repaired under local anesthesia with a mesh plug in all but 4 cases, no recurrences were noted, with follow-up ranging from 4 to 60 months [1].

Laparoscopic epigastric hernia repair is a good alternative to open repair in larger hernias and in those that are multiple. The falciform ligament and the peritoneum must be taken down to allow the visualization of the entire epigastric fascia and the identification of hernias only containing preperitoneal fat. There are no published series of laparoscopic epigastric hernia repair. If results are extrapolated from umbilical hernia repairs [6], laparoscopy may be expected to have lower complication rate and faster recovery than open repairs in large epigastric hernias, as well as a superior cosmetic result.

Spigelian hernia

A Spigelian hernia, also known as “spontaneous lateral ventral hernia,” is a hernia through the spigelian fascia, which is the aponeurotic layer between the lateral edge of the rectus abdominis muscle medially and the semilunar line laterally (Fig. 1). It is named after the Belgian anatomist Adriaan van den Spieghel [16], who was the first to describe the semilunar line or linea Spigeli, in 1645. This line represents the transition between the muscular and aponeurotic portions of the transversus abdominis muscle. A Spigelian hernia is generally an interparietal hernia, meaning that the preperitoneal fat and/or the hernia sac penetrate the transversus abdominis and internal oblique muscles but remain behind the external oblique aponeurosis (Fig. 2).

Although Spigelian hernias can occur at any point along the spigelian fascia, they almost always develop at or below the arcuate line, probably because of the absence of posterior rectus sheath at that level. In addition, the fibers of the spigelian aponeurosis run in a parallel fashion below the umbilicus instead of crossing one another at right angles, becoming vulnerable to separation by preperitoneal fat. In fact, 90% of Spigelian hernias are found within the Spigelian hernia belt of Spangen [17], which is a 6-cm transverse strip above the line joining both anterior superior iliac spines, and where the spigelian fascia is wider and weaker (see Fig. 1). Lower hernias are rare and should be differentiated from direct inguinal or suprapubic hernias. In most cases, the hernia defect is small—less than 2 cm—with well-defined and firm margins.

Spigelian hernias are normally acquired conditions, although congenital cases have been reported in children. Predisposing factors include morbid obesity, multiple pregnancies, rapid weight loss, chronic obstructive pulmonary disease, chronic constipation, prostatic enlargement, ascitis, trauma, and previous surgery weakening the semilunar line.
Clinical presentation and diagnosis

Spigelian hernias represent 0.12% to 2.4% of all abdominal wall hernias, although their incidence appears to be increasing, given the improved detection on cross-sectional imaging. They present most commonly in the fifth and sixth decades of life, but can be seen at any age. They have a slightly higher preponderance in women (female to male ratio, 1.4:1) [17].

The diagnosis of a Spigelian hernia is elusive and requires a high index of suspicion, given its rarity, the vague associated abdominal complaints, and the frequent lack of consistent physical findings.

The clinical presentation varies, depending on the size, the type, and the contents of the hernia. In patients with a reducible hernia, the most common symptoms are pain, which is usually intermittent and nonspecific, and a lateral bulge or mass when standing. Many patients, however, present with a hernia-related complication, given the small size of the hernia orifice; incarceration at the time of operation is seen in 17% to 24% of reported hernias [17,18].

Physical examination alone fails to detect any findings in 36% of patients [18] and can be falsely positive in up to 50% of cases [19]. Given
that most hernias are small and covered by a usually intact external oblique aponeurosis, it is difficult to palpate a hernia or a hernia defect. Persistent point tenderness in the spigelian aponeurosis with a tensed abdominal wall is often the only sign upon physical examination that suggests the diagnosis [17].

Imaging is recommended before surgical exploration, especially when the diagnosis is in doubt. Ultrasonography is accurate in displaying defects in the spigelian fascia [20,21]; it is easy to perform and not expensive, but is operator dependent. CT scan also allows the diagnosis of Spigelian hernia and gives more detailed information on the contents of the sac than does ultrasonography [21,22]. The true sensitivity and specificity of these diagnostic techniques is, however, unknown; in one study, false-negative CT occurred in 32% (6/19) of patients with obvious findings of a Spigelian hernia at the time of operation [14]. Modern helical CT is probably more accurate, and it is currently uncommon not to be able to confirm the diagnosis before surgical exploration. Only occasionally is diagnostic laparoscopy required to establish the diagnosis in patients with unclear acute or chronic pain.

**Treatment**

Spigelian hernias should always be surgically repaired in view of the high frequency of incarceration. Various techniques have been described and are currently performed.
Repair of this hernia has traditionally been accomplished with a targeted transverse incision and primary tissue repair [17,18,23]. This is often possible with low tension, given the typically small size of the hernia defect, and the repair is relatively durable. In one institutional review of 70 primary repairs with a mean follow-up of 8 years, the recurrence rate was 4.3%, with recurrences occurring at an average of 3 years postoperatively [18]. However, in another report of 21 primary repairs, the recurrence rate was high at 14.3% [24].

The addition of mesh to the open repair of Spigelian hernias has led to improved outcomes [18,24–28]. The various reported techniques involving mesh include intra- and preperitoneal sublay mesh placement [24–26], obliteration of the ring by a preformed polypropylene mesh umbrella-type plug [27], or a combination of preperitoneal underlay mesh connected to an overlay mesh lying over the internal oblique muscle [26]. None of the published series using mesh report any recurrences with variable follow-up periods.

Laparoscopic repair was first reported in 1992 [29]. Intraperitoneal, transabdominal preperitoneal, and totally extraperitoneal laparoscopic techniques with underlay mesh placement have been described [26,29–31]. In a prospective randomized trial comparing 11 open and 11 laparoscopic (8 intraperitoneal, 3 totally extraperitoneal) Spigelian hernia repairs, laparoscopy was shown to have a significantly lower morbidity and shorter hospital length of stay; no recurrences were noted in either group, with mean follow-up of 3.4 years [28].

Lumbar hernia

Lumbar hernias are those that occur in the area of the posterior abdominal wall bounded by the 12th rib superiorly, the iliac crest inferiorly, the erector spinae muscles posteriorly, and the posterior border of the external oblique anteriorly. Primary lumbar hernias can be congenital (rare) or acquired. They occur within two distinct anatomic spaces: the inferior and the superior lumbar triangles.

- **Inferior lumbar triangle or Petit’s triangle** is often simply called the lumbar triangle owing to its more superficial location and ease in demonstration. It lies in the posterolateral abdominal wall and is defined by the latissimus dorsi, the free margin of the external abdominal oblique muscle, and the iliac crest (Fig. 3). The floor of the inferior lumbar triangle is the internal abdominal oblique muscle. French surgeon Jean Louis Petit (1674–1750) is given credit for describing this triangle that bears his name. The triangle exists in 63% to 82.5% of the dissected cadavers [32,33] and its size varies a great deal, from merely a slit to a surface area greater than 12 cm², exposing a large component of the internal abdominal oblique muscle [32,33].
Superior lumbar triangle or Grynfelt-Lesshaft triangle lies deep to the latissimus dorsi. It usually has the shape of an inverted triangle and is defined by the 12th rib, the quadratus lumborum muscle, and the internal oblique muscle (see Fig. 3). The floor of the superior lumbar triangle is the transversalis fascia. Grynfeltt [34] first described a hernia through this lumbar triangle in 1866. The thickness of the aponeurosis varies in this space, but at its uppermost limit, the thinnest portion of the lumbar region is seen. In this thin area, the 12th intercostal vessels and nerves are usually found and it is in this region that hemias most often occur. Of the two lumbar triangles, the superior one is the more consistently found in cadavers (93.5%) and the more common site of herniation [32].

Predisposing factors in spontaneously acquired lumbar hernia are age, obesity, extreme thinness, chronic debilitating disease, muscular atrophy, intense slimming, chronic bronchitis, and strenuous physical activity [35]. It appears that the loss of fatty tissue facilitates the rupture of the neurovascular orifices that penetrate the lumbodorsal fascia; situations related to increased intra-abdominal pressure would act as factors that trigger the appearance of these hernias [35].

Clinical presentation and diagnosis

The clinical presentation of lumbar hernias depends on their size and contents. The most common clinical manifestation is a bulge that increases with
coughing and strenuous activity and tends to disappear with the patient in the lateral decubitus position. Patients usually report nonspecific abdominal discomfort, fatigue, or back pain along the area of distribution of the sciatic nerve [35]. The diagnosis should be considered in young women and athletes with back pain [36].

In about 9% of cases, patients present acutely with an incarceration such as a small- or large-bowel obstruction or a painful irreducible mass [36]. Strangulation may occur but is uncommon. Other rare manifestations include urinary obstruction symptoms such as hematuria, oliguria, and colicky pain; pelvic mass; and retroperitoneal and gluteal abscess.

Although the diagnosis is typically clinical based on the patient’s history, symptoms, and physical signs, the use of CT scan must be regarded as a routine exploratory technique in the preoperative evaluation of patients with lumbar hernias, to confirm the diagnosis, evaluate the abdominal wall muscles, reliably assess the anatomical relationships of the lumbar area, and identify the hernia contents [35,37].

Treatment

Lumbar hernias are difficult to repair because of their location and the surrounding bony structures [37]. Currently, there are two established possible surgical approaches, both performed with the patient in lateral decubitus: the anterior approach with lumbar incision and the laparoscopic approach.

The open anterior approach consists of an incision over the hernia site and extensive dissection, sometimes from the 12th rib to the iliac crest. In Grynfeltt hernias, the latissimus dorsi needs to be divided. Primary sutured repairs or the use of mesh plugs should not currently be recommended regardless of the size of the hernia defect, in view of the rigidity of the margins. Repairs are best performed using synthetic mesh placed in the extraperitoneal space, below the muscular layers, using a tension-free technique. The results of lumbar hernia treatment are difficult to analyze because of the limited experience of each surgeon. In one series of nine primary lumbar hernias (seven Grynfeltt hernias and two Petit hernias) repaired in this fashion, there were no cases of recurrence or postsurgical sequelae, such as pain or muscular weakness after a median follow-up period of 25 months [38].

The laparoscopic approach consists of either a transabdominal or a totally extraperitoneal technique [39,40]. The transabdominal approach is the more popular and usually requires mobilization of the colon and the kidney. The mesh can be secured to the costal margin superiorly, the iliac crest periosteum inferiorly, the erector spinae fascia medially, and external oblique fascia laterally [39]. In the posteromedial area, fixation of the mesh with intracorporeal suturing and avoiding tacks and transfascial sutures to prevent potential entrapment of the nerves that run in that area are advocated [37]. Advantages of the laparoscopic approach include excellent operative visualization and wide mesh coverage.
There are no published studies comparing these two techniques in primary lumbar hernias. However, in a prospective nonrandomized study of open versus laparoscopic repair of 16 secondary lumbar hernias, mean operating time, postoperative morbidity, mean hospital stay, consumption of analgesics, and time to return to normal activities were significantly lower in the laparoscopic group [41].

Obturator hernia

Obturator hernias are hernias through the obturator canal in the pelvis. This canal is the opening in the superior part of the obturator membrane covering the foramen formed by the union of the pubic bone and ischium, and through which the obturator nerve, artery, and vein pass from the pelvic cavity into the thigh (Fig. 4). Weakening of the obturator membrane may result in enlargement of the canal and formation of a hernia sac. The defect is usually located anterior and medial to the obturator neurovascular bundle [42]. The hernia is located deeply in the thigh between the pectineus and adductor longus muscles. The formation of these hernias is thought to begin with a “pilot tag” of properitoneal fat followed by the appearance of a peritoneal dimple that ultimately grows into a larger hernia sac that may

Fig. 4. View of the bony pelvis demonstrating the obturator canal (arrow) and the greater sciatic foramen (solid arrow).
contain small bowel, large bowel, omentum, fallopian tube, or appendix. The frequency of pilot tags in cadavers and the rarity of actual obturator hernias suggest that most obturator hernias do not progress beyond the early stages of development [43].

Obturator hernias are associated with profound asthenia and weight loss because of loss of the protective fat in the obturator canal. Women are affected more often than men because of their broader pelvis and larger obturator canal. Chronic lung disease, constipation, kyphoscoliosis, and pregnancy can predispose to obturator herniation by increasing intra-abdominal pressure [44].

**Clinical presentation and diagnosis**

Obturator hernias are rare, comprising approximately 0.073% of all hernias and occurring in approximately 0.4% of bowel obstructions [45]. They may occur bilaterally or in association with another hernia, most often a femoral hernia.

Obturator hernias typically affect elderly, frail, chronically ill, often institutionalized women; 85% of patients are female with mean age of 82 years and mean weight of 34.5 kg [46]. They characteristically affect the right side because the sigmoid colon tends to prevent it on the left side.

The diagnosis of an obturator hernia is difficult because it is rare, the symptoms are often vague, and the physical examination is rarely helpful, given that the hernia is concealed beneath the adductor muscles of the thigh; only 1 of 10 cases is correctly diagnosed preoperatively [45]. The classic symptom of groin pain radiating down the medial aspect of the thigh to the knee and caused by pressure on the obturator nerve, when present, is often overlooked or misinterpreted as arthritic pain in this often geriatric population.

More than 90% of patients with obturator hernia present with intestinal obstruction. One third of patients have a history of previous attacks of small-bowel obstruction that is likely secondary to transient herniation that resolved spontaneously. It is also common for nonspecific gastrointestinal symptoms, including anorexia, weight loss, and emaciation, to precede the diagnosis of hernia by many months.

Physical findings of obturator hernia are relatively nonspecific. Occasionally, a groin mass can be palpated with the patient supine, thigh flexed, adducted, and laterally rotated. Rectal or pelvic examination may confirm the diagnosis if a high index of suspicious is present. The Howship-Romberg sign is pathognomonic of obturator hernia and is present in approximately 50% of patients [42]. It is ipsilateral pain along the inner thigh that is exacerbated by extension, adduction, or medial rotation of the hip and relieved by flexion. The Hannington-Kiff sign, though more specific than the Howship-Romberg sign, is less widely known. It refers to an absent adductor reflex in the thigh [47]; a difference compared with the contralateral side and
a normal ipsilateral patellar reflex are indicators of compression of the obturator nerve.

Definitive preoperative diagnosis is usually made possible by CT scan. It is likely that with increasing use of CT scan in patients with small-bowel obstruction and in those with nonspecific abdominal complaints, the diagnosis of obturator hernia will become more frequent.

Treatment

When the diagnosis of obturator hernia is known preoperatively and strangulation is not suspected, the posterior preperitoneal approach is preferred and provides direct access to the hernia. It can be performed either through an open approach using a lower midline or Pfannensteil incision, or laparoscopically [48]. If petechiae or dark bowel suggest necrotic bowel, the peritoneal cavity can be easily entered for bowel resection. Reduction of the hernia may occasionally require incision of the obturator membrane with care to avoid injury to the obturator nerve and vessels. Direct primary suture repair of the hernia defect is difficult because the foramen is bordered by bone and spanned by the tough, immobile obturator membrane. Repair using a plug in the obturator canal has the potential for aggravating the obturator neuralgia and should probably be avoided. The preferred repair technique consists of placing a large flat polypropylene mesh in the peritoneal space to cover the obturator orifice as well as the femoral and inguinal areas [45].

When the diagnosis is unclear or when strangulation is suspected, the abdominal approach is most often favored. The hernia may then be repaired as described above after opening the parietal peritoneum. In the cases of strangulated or perforated bowel, gross contamination, and/or bowel resection, there is reluctance in using a synthetic mesh. A biologic mesh may be placed or nearby tissue such as periosteal flaps, bladder wall, or uterine fundus or ligaments may be mobilized.

The morbidity and mortality of obturator hernia repair remain high owing to the frequently delayed recognition with resultant bowel strangulation, and to the high incidence of patients with concurrent medical illness.

Other unusual hernias

Supravesical hernia

Supravesical hernias are hernias that protrude through the supravesical fossa. They occur because of a weakness in the lower aspect of the transversus abdominis muscle and the transversalis fascia where both insert into Cooper’s ligament [27]. According to their relationship with the vesical dome and the space of Retzius, they can be classified as prevesical, paravesical, intravesical, or retrovesical. They can be internal or external and may
occasionally penetrate the inguinal, femoral, or obturator rings. These hernias are very rare—only 70 cases have been reported worldwide [27]. They occur most frequently in elderly, malnourished males.

Preoperative diagnosis is possible if a given groin hernia is associated with signs and symptoms of intestinal obstruction along with urinary disturbances. Symptoms can sometimes mimic those of prostatic obstruction. CT scan can provide the diagnosis. Repair is usually performed through an infraumbilical midline laparotomy, using mesh if the field is clean.

**Perineal hernia**

Perineal hernias are hernias that protrude through the pelvic diaphragm. An anterior and a posterior form can be distinguished based on their position relative to the transverse perinei muscle. Primary perineal hernias are rare, with about 100 cases reported in the literature [49]. They occur most commonly in older, multiparous women, and can be quite large. They manifest clinically as a unilateral bulge in the area of the labia or the gluteal or perineal region. The hernia is frequently detected on bimanual rectal-vaginal examination. The diagnosis can be supported by sonography or CT scan.

Perineal hernias can be repaired through a transabdominal, a perineal, or combined transabdominal and perineal approaches. After the sac contents are reduced, the pelvic floor defect should be repaired with either direct suture or implantation of a mesh, depending on its size, its margins, and its relationship with the rectum.

**Sciatic hernia**

Sciatic hernias occur through the greater sciatic foramen (see Fig. 4). They are extremely unusual, with only 53 documented cases [50]. They are frequently asymptomatic and undiagnosed until intestinal obstruction occurs. When present, the most common symptom is an uncomfortable or slowly enlarging mass in the gluteal area. Herniation of the ureter or the bladder may manifest as urinary tract symptoms [51]. On rare occasions, sciatic hernias may mimic sciatica, with back or leg pain, owing to compression of the sciatic nerve.

A transperitoneal approach is recommended in patients presenting with small-bowel obstruction, especially when bowel strangulation is suspected. On the other hand, a less invasive transgluteal approach, in the prone position, may be used if the diagnosis is certain and the hernia contents appear viable and reducible. Prosthetic mesh repair is usually preferred.

**References**