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The characteristic and management of inguinal hernias based on the own experience

Charakterystyka i postępowanie w przypadku przepuklin pachwinowych oparte na własnym doświadczeniu

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Keywords

inguinal hernia, groin hernia, groin hernia repair

Słowa kluczowe

przepuklina pachwinowa, plastyka przepukliny pachwinowej

S u m m a r y

Introduction. Inguinal hernia repair is commonly performed surgical procedure all over the world. Patients usually report with the bulge or pain in the groin region that affects negatively their quality of life. The guidelines suggest surgical management for all symptomatic hernias in order to reduce clinical symptoms and avoid adverse complications.

Aim. The aim of the study was to assess data about the natural history of inguinal hernia including patients' age, profession, comorbidities and most commonly reported complaints. The surgical treatment has also been analyzed.

Material and methods. The study was based on the analysis of the medical records of 365 patients who underwent inguinal hernia repair between 2013 and 2017 at the I[st] Department of General and Endocrinological Surgery, University Hospital in Bialystok and at the Surgery Department at the Independent Public Health Care Center in Lapy.

Results. Men are more likely to develop inguinal hernia in comparison to women (317 vs 48 cases). The incidence of hernia increases with age and most commonly appears in patients who deal with physical work (81% of female cases and 71% of male cases). Palpable mass in groin region was present in 64.5% of women and 61% of men. Second most frequently reported symptom was pain during physical activity (52% of females and 57% of males). For open approaches, the Lichtenstein method has been performed most commonly and referred to 39.5% of women and 30.5% of men. Whereas, TEP repair was most frequently performed laparoscopic surgery (21% of women and 36.5% of men).

Conclusions. Older age, male sex and physical work are risk factors for developing an inguinal hernia. Patients most often report to the doctor due to the pain in groin region and palpable lump. The surgical treatment is essential to avoid adverse complications, thus the mesh repairs are recommended with the preference of performing laparoscopic procedures.

Conflict of interest
Konflikt interesów

None
Brak konfliktu interesów

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S t r e s z c z e n i e

Wstęp. Plastyka przepukliny pachwinowej jest powszechnie wykonywaną procedurą chirurgiczną na całym świecie. Pacjenci zwykle zgłaszają się do lekarza z wyczuwalnym wybrzuszeniem bądź bólem w okolicy pachwinowej, który wpływa negatywnie na jakość ich życia. Wytyczne sugerują postępowanie chirurgiczne w odniesieniu do wszystkich przepuklin objawowych w celu zmniejszenia objawów klinicznych oraz uniknięcia niekorzystnych powikłań.

Cel pracy. Celem niniejszej pracy było dostarczenie informacji o naturalnym przebiegu przepuklin pachwinowych z uwzględnieniem wieku, zawodu, chorób współistniejących oraz najczęściej zgłaszanych dolegliwości. Przeprowadzona została także analiza postępowania chirurgicznego.

Materiał i metody. Praca została oparta na analizie historii medycznych 365 pacjentów, których poddano zabiegom plastyki przepukliny pachwinowej w latach 2013-2017 w I Klinice Chirurgii Ogólnej i Endokrynologicznej Uniwersyteckiego Szpitala Klinicznego w Białymstoku oraz na Oddziale Chirurgicznym Samodzielnego Publicznego Zakładu Opieki Zdrowotnej w Łapach.

Wyniki. Ryzyko rozwoju przepukliny pachwinowej jest znacznie większe u mężczyzn niż u kobiet (317 vs 48 przypadków). Częstość występowania przepukliny rośnie z wiekiem i częściej pojawia się u pacjentów, którzy zajmują się pracą fizyczną (81% kobiet i 71% mężczyzn). Wyczuwalny guzek w okolicy pachwinowej był obecny w przypadku 64,5% kobiet oraz 61% mężczyzn. Drugim co do częstości objawem zgłaszanym przez pacjentów był ból w trakcie wysiłku fizycznego (52% kobiet i 57% mężczyzn). Najczęściej przeprowadzanym zabiegiem spośród otwartych metod była operacja Lichtensteina i dotyczyła 39,5% kobiet i 30,5% mężczyzn. W przypadku zabiegów laparoskopowych najliczniejszym dostępem chirurgicznym był TEP (21% kobiet i 36,5% mężczyzn).

Wnioski. Starszy wiek, płeć męska oraz wykonywanie pracy fizycznej są czynnikami ryzyka dla rozwoju przepukliny pachwinowej. Pacjenci najczęściej zgłaszają się do lekarza z powodu wyczuwalnego guzka w okolicy pachwinowej oraz dolegliwości bólowych w trakcie aktywności fizycznej. Postępowanie chirurgiczne jest niezbędne w celu uniknięcia niekorzystnych komplikacji. Operacje z użyciem siatek są preferowaną metodą zaopatrzenia przepukliny pachwinowej ze wzrastającą tendencją do wykonywania zabiegów laparoskopowych.

INTRODUCTION

Inguinal hernia repair is the most common procedure performed by general surgeons, estimated at more than 20 million hernias' interventions every year around the world (1). Inguinal hernias comprises for up to 97% of groin hernias with the distinct dominance in occurrence in males (90.2% males vs. 9.8% females) (2). Except the male gender, other patient-related risk factors for developing an inguinal hernia include older age, positive family history, systemic connective tissue disorders and coexistence of hiatal hernia (3, 4). Smoking is also a potential risk factor for herniation, although its influence is uncertain. Some studies show that tobacco use changes the collagen metabolism causing the serologic turnover of type IV collagen, which increases the risk for inguinal hernia (5). However, recent research shows the negative link between smoking and development of inguinal hernia, which still remains unexplained (6). The cumulative work exposure causing the increased intraabdominal pressure is involved in lateral hernia formation. Studies show that prolonged standing or walking, frequent heavy lifting and total load of daily lifting activities are external risk factors for lateral hernia creation (7, 8). By definition, the inguinal hernia is a condition when part of an intestine or fat protrudes through the area of weakness in the groin region. The inguinal hernias have three components: the neck (opening in the abdominal wall), the sac, which is formed by the protrusion of the peritoneum, and the contents that include any tissue or organ that shifts through the neck to the hernia sac. The position of hernia sac towards the inferior epigastric vessels determines the division of inguinal hernia into direct (appears medially to the vessels) and indirect (localizes laterally to the epigastric vessels) (9). In some cases, hernial sacs are present on both sides of the inferior epigastric vessels. This condition is known as a pantaloon hernia and is defined as ipsilateral, concurrent direct and indirect hernias. The clinical manifestation of inguinal hernia includes the wide range of sympomts. Most frequently, patients complain of hernia, groin or lower abdomen pain, increased peristalsis, pain during sexual activity and lower urinary tract symptoms. Up to 7% of patients may remain asymptomatic (10-12).

Proper physical examination is essential in the diagnosis process of inguinal hernia. Firstly, the visual inspection of inguinal area should be performed to detect any bulge or asymmetry in groin region. Secondly, the inguinal area should be palpated in standing and supine position in order to reveal the presence of hernia. The examination should be performed in relaxed position and in the situation of increased intraabdominal pressure, thus the patient should be asked to cough or perform the Valsalva maneuver. The radiological investigation is needed when the clinical evaluation has not reveal any findings. Ultrasonography is usually the first choice test as it is widely available, inexpensive and has minimal complications. It has the overall sensitivity of 96.6% and specificity of 84.8% (13). If needed, magnetic resonance imaging or computer tomography may be used to verify the proper diagnosis. The only treatment of inguinal hernia is a surgical treatment that is based on the repair of the posterior wall of inguinal canal. The "watchful waiting" may be applied only to male patients with primary, minimally symptomatic or asymptomatic inguinal hernia (14). The open approaches are based on either pure tissues approximation or tension free mesh repair. The primary methods for tissue repairs include the Bassini, Shouldice, Halstead and McVay procedure. The Lichtenstein method is the most frequently performed open mesh-based technique. Totally extraperitoneal (TEP) repair and transabdominal preperitoneal (TAPP) repair are methods of laparoscopic surgery. In TEP method the mesh is inserted directly into the preperitoneal space, whereas, in the TAPP technique the preperitoneal space is reached through the peritoneal cavity. Recent

study shows that sutured repairs are associated with a higher risk of reoperation for recurrence of hernia over 5 years compared with the open mesh and laparoscopic mesh repair. The overall recurrence rate in the non-mesh group was evaluated at 18.3%, in the open mesh group was 13.2% and in the laparoscopic mesh group was 11.2%. Other possible complications after surgical treatment of inguinal hernia include: bowel obstruction, bleeding, infection, late intraabdominal abscess, enterocutaneous fistula, seroma, hematoma, nonhealing wounds and chronic pain (15).

AIM

The aim of the study was to present the natural history of inguinal hernia including patients' age and profession, most frequently reported complaints, comorbidities and surgical approaches for inguinal hernia repair.

MATERIAL AND METHODS

We analyzed the medical records of 365 patients who underwent inguinal hernia repair between 2013 and 2017 at the I[st] Department of General and Endocrinological Surgery, University Hospital in Bialystok and at the Surgery Department at the Independent Public Health Care Center in Lapy. The procedure has been performed by the same operating team – operator and two assistants. Factors such as, age, profession, coexisting diseases, clinical symptoms and type of inguinal hernia have been analyzed. Different surgical approaches have also been investigated including changes in the methods used within studied period.

RESULTS

The study group included 365 patients age 21-72, average age 59.5. Males accounted for 87% (n = 317) with average age of 56 years, while the percentage of female patients was 13% (n = 48) with the average age of 63 years. According to age by decade, almost half of women was at their 6th decade of life. In case of men, no peak of incidence has been observed, but almost 77% of male patients were between 31 and 60 years old (fig. 1).

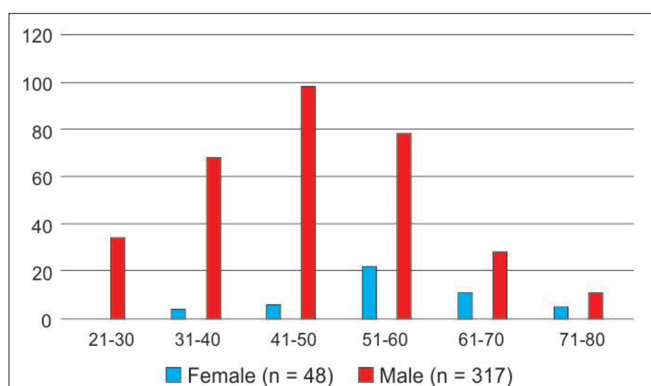

Fig. 1. The incidence of inguinal hernia according to age by decade

The majority of patients reported with inguinal hernia were involved in physical work (81% of women and 71% of men). One third of females and about 20% of males were diagnosed with comorbidities that could possibly lead to hernia formation such as: respiratory tract infections with coexisting cough (12.5% of females and 12% of males), asthma (14.5% of females and 3.4% of males) and the history of cancer (6% of females and 4.5% of males). More than 25% of all patients also reported the injury preceding the appearance of inguinal hernia such as the jump down from the stairs or heavy lifting (tab. 1, fig. 2).

Tab. 1. The occurrence of inguinal hernia according to occupational activity, injuries and comorbidities

	Mental work (%)	Physical work (%)	Injuries (%)	Coexisting diseases (%)
Female	9 (18.8%)	39 (81.3%)	11 (22.9%)	16 (33.3%)
Male	91 (28.2%)	226 (71.3%)	87 (27.4%)	65 (20.5%)

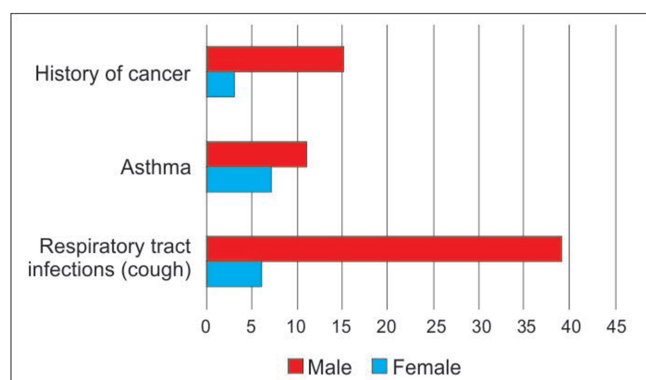

Fig. 2. Coexisting diseases

The pain during physical activities was the most frequently reported clinical symptom in both genders, present in 52% of females and 57% of males. The clinical manifestation also included pain at rest and discomfort at rest or during physical work. Over 60% of patients reported a bulge in groin region that was easily palpable (64.5% of females and 61% of males) (tab. 2).

Tab. 2. Clinical manifestation of inguinal hernia

Clinical evaluation	Female (%)	Male (%)
Discomfort at rest	14 (29%)	108 (34%)
Discomfort during physical activity	18 (37.5%)	152 (48%)
Pain at rest	21 (43.5%)	60 (19%)
Pain during physical activity	25 (52%)	181 (57%)
Palpable lump	31 (64.5%)	193 (61%)

Direct hernia was present with the distinct dominance in women and occurred in 81% of cases. While in the group of men, an indirect hernia was most commonly diagnosed and referred to 71% of studied group. In 9.5% of male cases, the inguinal hernia passed into to scrotum and formed scrotal hernia. The surgical management included 5 different procedures: Halstead, Bassini, Lichtenstein, TAPP and TEP methods. Nopredominance between the open and laparoscopic

procedures in the terms of overall repairs performed has been observed. The open procedures involved 50.7% of patients (n = 185), while the laparoscopic approaches applied to 49.3% of studied group (n = 180). However, the increasing tendency of laparoscopy application has been observed for the whole observation period. For the first two years of analyzed period, TAPP and TEP approaches were rarely performed and referred only to male population with the incidence of 0.5% for TAPP (2013 and 2014) and 2.5% for TEP in 2013 and 2% in 2014. In this period, the dominance of open approaches has been observed with the Lichtenstein method being the most commonly performed (10% of all cases). Over the time, the frequency of TAPP and TEP repairs increased. TAPP has been performed in 8% of female and 4.5% of male group in 2017, whereas the TEP has been performedin 8% of women and 13% of men. Among all methods the mesh repairs have been most commonly performed in both genders. The Lichtenstein procedure has been performedin 39.5% of females and 30.5% of males, TAPP in 8% of women and 16% of men, while TEP in 21% of females and 36.5% of males (fig. 3, tab. 3).

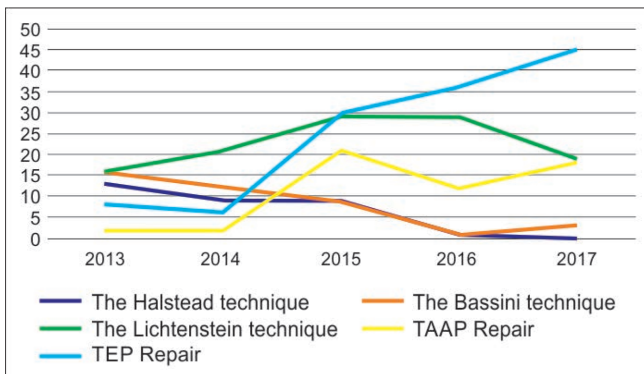

Fig. 3. Changes in the amount of different surgical procedures observed over the studied period

Tab. 3. Distribution of different surgical approaches among gender

Surgical intervention	Female (%)	Male (%)
The Halstead technique	5 (10.4%)	24 (7.6%)
The Bassini technique	10 (20.8%)	31 (9.8%)
The Lichtenstein technique	19 (39.6%)	96 (30.3%)
TAAP repair	4 (8.3%)	51 (16.1%)
TEP repair	10 (20.8%)	115 (36.3%)

DISCUSSION

The lifetime risk for developing an inguinal hernia has been estimated at 27% for men and 3% for women (16). The incidence of inguinal hernia varies widely depending ongenderand age. Presentedstudy showed that the occurrence rate of inguinal hernia in men is almost 7 times higher than in women (317 male cases vs. 48 female cases) and that it increases with age in both genders. The available studies show the same tendency according to age- and gender-specific incidence rates (2, 17). The occupational activity is also an important factor describing the group of patients affected by inguinal hernia. Kang et al. found the highest ratios of hernia development in industries and occupations involving manual labor (18). Our analysis also proved that there is much higher incidence of hernia formation in patients involved in physical work rather than mental work. Physical work also includes athletes who are diagnosed with sportsmen hernias. The etiology of this condition is considered to be the effect of muscle imbalance that increases the weakness of the posterior wall of the groin (19, 20). There is also a belief that hernia may be formed during strenuous or traumatic event, such as lifting the heavy object, fall or jump down from the stairs. In present study, the preceding injury was reported by 11 women and 87 men. However, there is no clinical evidence to support the hypothesis that single injury may act as a major factor for hernia formation. Usually, more detailed assessment is needed to evaluate congenital or acquired causes for weakness in the connective tissue (21, 22).

Most inguinal hernias are diagnosed through the patient's history and physical examination. The common symptoms include palpable bulge in the groin region, pain and discomfort at rest or during physical activities. However, up to 7% of patients mayremain asymptomatic (10). Any mass palpated in the groin region should be evaluated for other possible diagnosis such as: lymphoma, lymphadenopathy, metastatic neoplasia, lipoma, hydrocele, abscess, hematoma or testicular torsion. The bulge in the groin region that is detected in the inguinal canal while coughing or Valsalva maneuver is usually an inguinal hernia. Firm, tender masses, that enlarge in time with the coexisting systemic symptoms and weigh loss suggest the lymphoma or metastatic neoplasia, thus the proper imaging methods should be performed to confirm the diagnosis. Testicular torsion usually have an acute onset of pain with a high-riding testis, swelling and tenderness (23).

Patients diagnosed with inguinal hernia should undergo the surgical management as there is always a risk for strangulation that may be a life-threating condition. The European Hernia Society accepts the watchful waiting as an option for males with asymptomatic or minimally symptomatic inguinal hernias. De Goede et al. compared surgery and watchful waiting in men aged 50 years and older and found no relevant differences in favor of elective repair, thus it confirms that watchful waiting is a reasonable option for mildly symptomatic or asymptomatic male patients (24). Over the years, many surgical techniques for repairing an inguinal hernia have been introduced. Previously mentioned guidelines of European Hernia Society recommend that nowadays all male adults (age > 30 years) with a symptomatic inguinal hernia should be operated on using a mesh technique. Several studies proved that mesh repairs have reduced rate of hernia recurrence and lower risk of visceral and neurovascular

injuries (25). The meta-analysis performed by Grant et al. provided the strong evidence than open mesh repair is associated with the reduction in recurrence rate between 50 and 75% (26). The advantages of mesh repairs are also seen in length of hospitalization (1.8 vs 4.2 days) and time to return to work (7.3 vs 17.2 days) (27). The comparative analysis of laparoscopic (TEP and TAPP) and open mesh repair (the Lichtenstein method) indicates the advantages of endoscopic surgery over open procedures. The superiority of laparoscopic surgery is seen in less postoperative pain, quicker return to normal activities and improved quality-of-life outcomes (28, 29). According to international guidelines for groin hernia management, in the case of laparoscopic methods, as TAPP and TEP repairs have comparable outcomes, it is recommended to choose the technique based on the surgeon's skills, preferences and experience (30). Taking into account all of the above reports,presentstudy showed slowly growing advantages interms of numbers for mesh repairs and laparoscopic procedures. It has been stated thatthe TEP method is less invasive leading to faster recovery after surgery with less incidence of postoperative pain, thus it may be performed as one-day surgery.

CONCLUSIONS

Present study supports the knowledge that older age, malegenderand manual labor are risk factors for developing an inguinal hernia. Above analysis found that palpable mass in groin region and pain during the physical activity are most commonly reported complaints. The study showed that over the investigated period there was an increasing tendency for performing mesh repairs in advantages for laparoscopic procedures.

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