Epidemiology and Risk Factors for Recurrence of Inguinal Hernia

Fadhil Ahmed Dalaf[1], Firas Najm Abed[2], Omar Khaleel Ibrahim[3]

[1,3]*Baquba Teaching Hospital*
[2]*Baladrouse general hospital*

KEYWORDS
Inguinal hernias, primary hernias, recurrent hernias, inguinal hernia prevalence, and risk factors

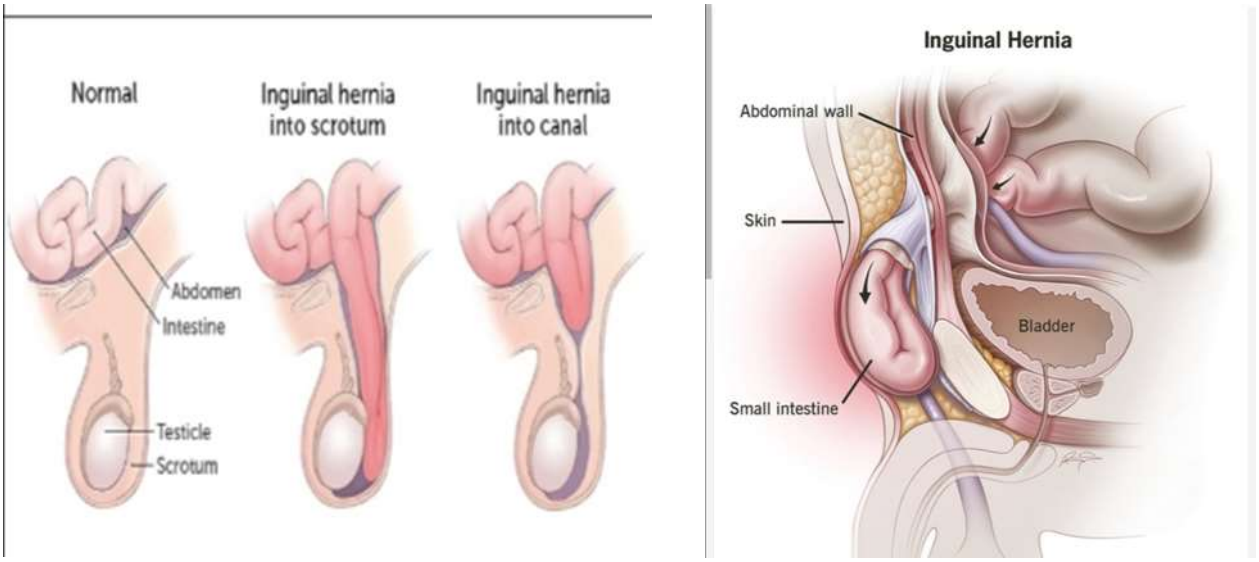
ABSTRACT

Following inguinal hernia surgery, the risk of recurrence is a major clinical concern. The issue involves several recurrent risk factors, including surgery. We have recognized the approach, recurrence, and familial background. Patient-related variables, while not technically complex, have an impact on the risk. Few studies have examined the risk of recurrence following inguinal hernia surgery. The statistical features of inguinal hernia incidence Both initially and later on, in addition to examining the patient's There are several factors that can lead to the failure of inguinal hernia surgery. The thesis includes research on historical and ecological issues. The epidemiologic data for groin hernias nationwide has been revealed. The geographical distribution of groin hernias and the risk of non-technical exposure is being investigated. elements linked to the recurrence of symptoms. According to the results, mundane, Characteristics that are specific to the patient have a significant impact on the risk. The incidence of recurrence following inguinal hernia repair is an important consideration. The rationale behind , combination of factors likely contribute to the recurrence of inguinal hernias, which typically occur in the range of patient-related risk factors, both technical and non-technical, are present. Furthermore, there are various types of groin hernias that can individual pathophysiologies. We need to put this knowledge into practice. utilized in clinical settings to reduce the risk of recurrence.Regarding the design of future studies that investigate recurrence after the consequence of inguinal hernia surgery Methods: All patients admitted to the hospital exhibited groin edema, soreness, or both. We palpated the patient's groins on all sides to look for a hernia, impulse, or scar from a prior procedure. We recorded additional details about the hernia, such as its primary or recurring nature. Results showed that the most prevalent age group was 31–60 years old, and that out of the 140 patients, 79.2% were male and 20.8% were female. While 25.5% of the cases were recurrent hernias, 74.5% were primary hernias. Although a small percentage of individuals experienced swelling for longer than two years, the vast majority experienced it for no more than six months. Incorrect defecation (46.7% of cases) and excessive lifting (52.4%) were the leading causes of hernias. Conclusions In order to aid future research in predicting the occurrence of inguinal hernias, it is necessary to undertake this type of study in every geographical location. Aim of study to show recurrence inguinal hernia after surgery related to epidemiology and risk factors.

1. Introduction

Anything that sticks out of its usual cavity and is considered a viscera is a ruptured hernium. A term used to describe an inguinal hernia is the protrusion or passage of a peritoneal sac with or without abdominal contents through a weak spot in the abdominal wall in the groin. A sac-like structure, which is formed from an external inguinal diverticulum of the peritoneum, covers the protruded substance [1]. Hernias in the inguinal region can be either direct or indirect. Protruding from the inguinal canal and medial to the inferior epigastric veins is a direct hernia, which is caused by a weakness in the posterior abdominal wall. It is possible to have an indirect inguinal hernia that extends into the inner inguinal ring. Inguinal hernias can either be located inside the canal or extend from the outside of the inguinal ring all the way to the testicles [2]. Swelling in the groin area, groin pain or lack thereof, and a change in bowel habits are the symptoms that manifest as an inguinal hernia [3]. There is a lifetime risk of 27% for men and 3% for females due to abdominal wall hernias, which is estimated to be 1.7% across all age groups. Approximately 75% of these hernias happen in the groin.One possible explanation for the increased occurrence rate in males is that their inguinal cannulas are wider than women's [4].If you have an inguinal hernia, you may need surgery to repair it [6]. The annual number of herniorrhaphy treatments is around 20 million, making it one of the most common types of surgical repairs [7].A multitude of risk variables impact the occurrence of both primary and recurrent inguinal hernias [8].A number of factors, including age, sex, and Patent Processus Vaginalis (PPV), as well as environmental factors including smoking and strenuous physical labor, can increase the likelihood of inguinal hernia development [9].The development of an inguinal hernia is accelerated by strenuous physical labor and a positive family history of the ailment.When you strain when you urinate or defecate, you put pressure on your internal organs, which can cause an inguinal hernia to develop [8]. The incidence of inguinal hernias increases dramatically after the age of 20, and one out of five cases occurs in boys younger than four years old, according to an analysis of African studies [6]. When do inguinal hernias occur? The hallmark symptom of an inguinal hernia is a painful bulge in the patient's

groin that subsides when they lie down or apply light pressure.Physical exertion exacerbates the pain that most people experience. Not only does one,third of surgical patients report no pain, but only a small percentage have significant discomfort (1.5% at rest and 10.2% when moving around). Strangling is less common with inguinal hernias than with femoral ones, but it is still possible for the hernias to become irreducible or incarcerated and cause obstruction or strangling. Emergency surgeries accounted for 5% of primary inguinal hernia repairs in 1998.1999, according to national figures from England.The likelihood of experiencing acute complications increases with age, as does the length of time that the hernia has been present and its irreducibility. What is the clinical evaluation process for an inguinal hernia? Reducible hernias can be driven back into the abdominal cavity when they arise intermittently (such as while straining or standing), while irreducible hernias cannot. The diagnosis of an irreducible hernia is typically based on a clinical examination of the patient, who will likely have been dealing with the condition for some time. The hernia could be on one side or both, and it might come back even after surgery (recurrent hernia). You can tell if an inguinal hernia is direct or indirect by looking at how the sac protrudes from the inguinal canal: a direct hernia bulges straight through the inguinal canal's posterior wall, while an indirect hernia follows the canal's course through the internal inguinal ring and the spermatic cord (fig. 1). However, distinguishing between direct and indirect hernias is not clinically useful. When evaluating a patient for a possible inguinal hernia, the components listed in the box are crucial.



Imaging

Visual Evaluation Imaging studies typically are not necessary for men's diagnoses. 15It is common for women to need imaging to rule out other possible causes of groin discomfort, such as a recurrent hernia, complications following surgery, or a groin lump or hydrocele.Ultrasonography is the primary imaging method for detecting occult hernias; it can detect probable cases of groin hernias that are not visible during a clinical examination with a sensitivity ranging from 33% to 86% and a specificity ranging from 77% to 90%. in references 16 and 17.Despite negative ultrasound results, a groin hernia may still be suspected clinically, in which case an MRI with the Valsalva maneuver could be an option to explore. For hidden hernias, magnetic resonance imaging (MRI) has a sensitivity of 91%, a specificity of 92%, a positive predictive value of 95%, and a negative predictive value of 85%.MRI is more effective than ultrasound and CT scans for detecting inguinal hernias, especially hidden hernias. When it comes to detecting hidden hernias, herniography which entails injecting contrast material into the hernial sac has a sensitivity of 91% and a specificity of 83%. With an 80% sensitivity rate and a 65% specificity rate, it outperforms computed tomography and ultrasonography, and it could be appropriate for some patients. Section 17.

Management As part of their 2018 literature review, a number of worldwide associations (including the HerniaSurge group) developed standards for the treatment of groin hernias. Bard and Johnson & Johnson, two companies that make hernia mesh, sponsored the organization financially.The experts at HerniaSurge divide treatment options into two broad groups: conservative and surgical. Environmentally Responsible Leadership [18, 19]

Conservative Management In males, if the hernia is manageable and the patient is able to go about their daily life pain-free, then watchful waiting is a safe and reasonable option. In [20], once discomfort begins to manifest, surgical intervention should be initiated. The increased risk of strangulation and femoral hernias makes watchful waiting an inappropriate practice for women who are not pregnant. Also, due to the increased chance of imprisonment, watchful waiting is not advised for hernias that induce symptoms [21]. There are 19 A potential complication of careful observation is the imprisonment of abdominal contents due to their becoming trapped in the hernial sac.The blood supply to the incised hernial contents can be hindered, leading to strangling as time goes on.Entrapment of a portion of the intestinal girth can lead to Richter hernia, an extremely rare and potentially fatal condition. dead inside the sac surrounding the hernial nerve. [22] is a Medical professionals should inform patients with asymptomatic or minimally symptomatic inguinal hernias about the predicted progression of the ailment and the dangers of emergency surgery, according to the HerniaSurge guideline.During conservative therapy, family physicians have the option to refer patients to a surgeon or collaborate closely with them. This includes regular follow,up appointments to watch for symptoms and to keep an eye out for any underlying conditions that could have played a role in the hernia. While carefully waiting, it is not apparent what the optimal follow up interval should be. Patients who are pregnant often undergo watchful waiting as well, as self-limiting round ligament varicosities can produce swelling in the groin. [23] The progression of color Using Doppler imaging, one can differentiate between a genuine hernia and a round ligament varicosity. None of the 20,714 pregnant patients in a 2017 cohort study who had hernias, whether elective or emergency, had any kind of hernia repair done while they were pregnant.Ten of the patients had spontaneous disappearance of the groin bulge following delivery. [24] Postponing treatment of reducible inguinal hernias in pregnant patients appears to be a safe and cost-effective option.

Surgical Management

Several logistical considerations go into deciding which surgical approach is best for fixing an inguinal hernia, including the ease of access to anesthesia, the surgeon's personal preference and level of training, the patient's financial situation, and the cost and availability of mesh. It is helpful for family physicians to learn about the most common surgical procedures so they may better monitor their patients after surgery and identify any problems, such as recurrence. There are various types of surgical procedures, including open anterior repair, open posterior repair, tension-free mesh repair, and laparoscopic repair. Despite the fact that nonmesh techniques are no longer preferred in the US, they are nevertheless seen as appropriate elsewhere. Since mesh techniques have lower recurrence rates than non-mesh procedures, they are highly recommended. According to a 2009 European recommendation, an open anterior nonmesh approach is the preferred choice when mesh cannot be used.In terms of pain management following surgery, laparoscopic procedures are preferable to tension-free mesh repair. The year 19 Some common laparoscopic techniques are the transabdominal preperitoneal approach and the complete extraperitoneal approach.Although access begins at different anatomical locations in each method, mesh is inserted in the preperitoneal area in both.Groin hernias are best repaired laparoscopically rather than openly due to the improved chances of a successful recovery. Laparoscopic procedures are specifically advised in women by guidelines to lessen the likelihood of chronic pain and prevent the omission of femoral hernias.If a patient has had a hernia fixed in the past using an open method, laparoscopic procedures can be employed to avoid significant scar tissue. While laparoscopic surgery was linked to a higher rate of vascular, colonic, or bladder injury and a longer recovery time, overall, laparoscopic surgery had shorter recovery times, less pain, earlier resumption of daily activities, and lower recurrence rates, according to a Cochrane review that compared the two methods.

in [13]

Postoperative Care

Surgeons have traditionally, and according to professional opinion, advised patients to avoid strenuous exercise for four to six weeks following groin hernia repairs. Be that as it may, regardless of surgical technique, no data suggests that early physical activity raises the chance of recurrence. Physical exercise should be encouraged for the majority of patients for three to five days following . for hernia repair. There is no proof that long courses of analgesics or sick days are beneficial. [16]

Complications

Acute complication Absolut

Possible complications include: headache following spinal anesthesia, inguinal cyst, minor surgical wound dehiscence, fever, orchialgia, bleeding, severe pain, scrotal edema, major edema, imprisoned hernia, orchitis, infection, bruises, hemorrhage, and seroma.

Postoperative complications

Potential difficulties that may arise after surgery Developing a seroma or hematoma With a prevalence of 2–25%, it is a frequent consequence following laparoscopic hernia surgery. They often appear following extensive indirect hernia repairs.For the most part, they go away on their own after around four to six weeks.Seromas can be prevented by fenestrating the transversalis fascia in a direct hernia, anchoring the direct sac to pubic bone, and preventing dissection of the hernial sac from the cord structures.After significant dissection or considerable bleeding, some surgeons may insert a drain. 2) Deterring urine flow After hernia repair, this problem occurs in 1.3% to 5.8% of cases.(3) The presence of prostatism signs is a common trigger, particularly in older patients. Prior to surgery, these individuals should be catheterized, and the catheter should be removed the following morning. (3) Pain in the Nervous System According to reports, the occurrence of this problem ranges from 0.56 to 4.66 percent, depending on

the repair procedure used. The intraperitoneal onlay mesh technique was removed from consideration as a feasible repair option due to the high incidence of neuralgias it caused, according to one study.the third Many times, the genitofemoral nerve, intermediate cutaneous nerve of the thigh, and lateral cutaneous nerve of the thigh are all affected.The most common causes of their involvement are tack entrapment or mesh-induced fibrosis. To avoid this problem, don't fix the mesh lateral to the deep inguinal ring in the triangle of the pain area. Also, safely dissect a large hernial sac and don't cut fascia over the psoas. 4) Prostate discomfort and edema,A full sac, in particular, can have its chord structures severed to the point where this condition develops. An estimated 0.9 to 1.5% of cases are reported. The majority are temporary. Testicular atrophy was not caused by the rare case of orchitis that was observed in a handful of patients [3, 4]. 5. infections of the mesh and wounds We have extremely low rates of wound infections. The risk of mesh infection is high; hence, it's important to follow all aseptic protocols during the operation. A full course of antibiotics should be taken to treat any endogenous infection before surgery. 6.Recurrence the occurrence,Without it, no hernia repair procedure would be considered a success. Reducing the likelihood of complications after endoscopic repair calls for an expert's familiarity with human anatomy and a methodical approach to fixing the problem. Potential issues that arise later on Infertility Problems conceiving following inguinal hernia surgery are more common than in the whole population. Estimates put the risk of vas deferens injury after surgery at 0.3% in adults and between 0.8% and 2.0% in children. 31 It is possible for testicular atrophy to result from injury in 0.5% of primary hernia repairs; the risk increases tenfold for subsequent operations. 31 This suggests that mesh repair may lessen the likelihood of testicular loss and infertility by reducing recurrences. Total number of recurrent hernias (18).

2. Methods

We conducted an observational study. The surgical and urology departments at Baquba Teaching

Hospital From March 2021 to March 2024, seventy adults sought treatment at the surgical outpatient department for inguinal hernia repair or recurrence. All of the people who participated in the study arrived at the hospital complaining of a swollen groin, whether or not it hurt. After obtaining informed consent from all participants, a questionnaire collected demographic characteristics such as patients' identities, family histories, lifestyle habits, occupation, length of swelling, cough, constipation, and comorbidities. The surgeon conducted a comprehensive clinical examination after explaining to the patient the purpose of the examination and the need to maintain their privacy and confidentiality. The surgeon meticulously documented the hernia's specifics, including whether it was a primary or recurrent hernia, the duration between the current and previous procedures, the type of mesh used, the frequency of recurrence, and the details of the final surgery. We palpated the patient's groins on all sides to look for a hernia, impulse, or scar from a prior procedure. We detected hernias by detecting the presence of a noticeable bump. The neck of a palpable hernia either orients backwards into the belly or is contiguous with the inguinal canal. We reached the external ring by invaginating the scrotum with the little finger in cases where no lump was visible. We then instructed the subject to cough, aiming to detect a palpable impulse. We assumed that the scarring at the spot represented a recurrence of the hernia.

Statistical analysis

Stata Enterprise ver. 5.1 was used for data analysis.database management system (SAS, Inc., Cary, NC, USA). Statistical Informationfeatures, both clinical and otherwise, were presented asmiddle values for continuous variables and percentages for categoricalvariables. A comparison was made using the chi-square test.distinctions between multiple-category variables. A t-test for students in order to compare differences, the Wilcoxon rank sum test was employed.considering variables that are continuous. Having a p-value lower thanThe significance level was set at 0.05.

3. **Results and Discussion**

79.2%, were men, and 20.8%, were girls. Of the total patients, 35.8% were in the 46–60 age bracket, with 42(29.7% of the total) falling into the 31–45 age bracket (Table 1). There were 104 primary inguinal hernias (74.5% of the total) and 36 recurrent hernias (25.5% of the total).

Table 1: Patient distribution by age group

Age	Number	Percentage
18-30	6	3.7%
31-45	42	29.8%
46-60	50	35.7%
61-75	28	20.9%
>75	14	9.9%
Total	140	100%

Most patients' swelling periods were shorter than six months, and only a small percentage lasted longer than two years (Table 2).

Table 2: The swelling Period

Period of swelling	Number	Percentage
6 months	80	57.1%
1-2 years	44	31.1%
>2 years	16	11.8%
Total	140	100%

There were 80 males (or 77.2% of the total) with primary inguinal hernias, and 24 females (or 22.8% of the total) with primary hernias. Fifteen men, or 85.2% of the recurrent instances, had hernias, compared to twenty eight women, or 14.8% (Table 3). 66 (or 47.6%) of the patients' hernias were on the right side, while 46 (or 33.5%) were on the left. Bilateral inguinal hernias were present in 26 patients (18.9%). Inappropriate bowel movements, most commonly constipation, caused hernias in 66 patients

(46.7% of the total), and hard lifting in 74patients (52.4%). 58 people (41.5%) had chronic obstructive pulmonary disease (COPD), while 44 people (31.6%) had diabetes. 52patients (37.3% of the total) smoked cigarettes, and 54 (8.2%) were alcoholics (Table 4).

Table 3: Prevalence of primary and recurrent hernia among men and women

sex	**Primary hernia (%)**	**Recurrent hernia (%)**	**Total (%)**
Males	80 (77.2%)	30 (85.2%)	110 (79.2)
Females	24 (22.8%)	6 (14.8%)	30(20.8%)
Total	104 (74.5%)	36(25.5%)	140 (100%)

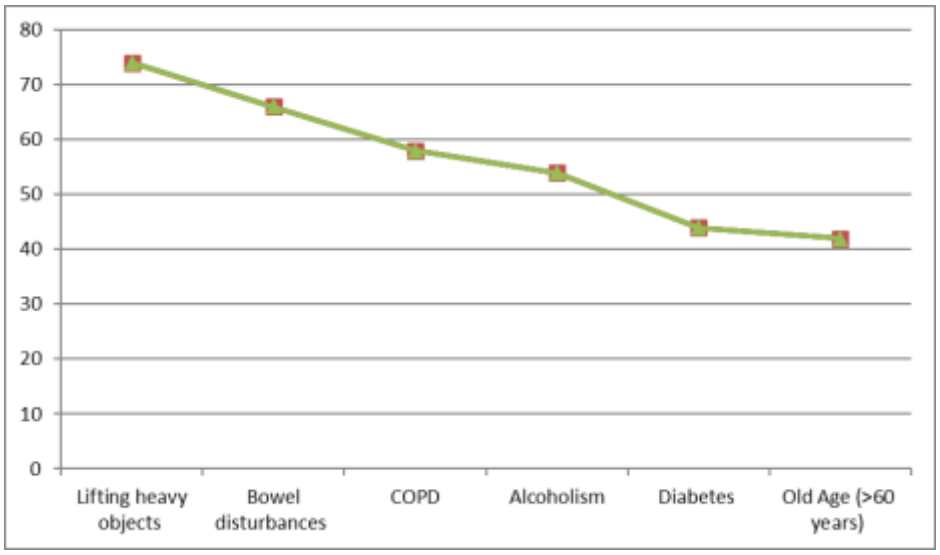


Fig1 : Risk factors of recurrence inguinal hernia.

Table 4: Prevalence side of recurrent hernia among patients.

Recurrent hernia	number	**Percentage**
Right	24	75%
Left	12	25%
Total	36	100%

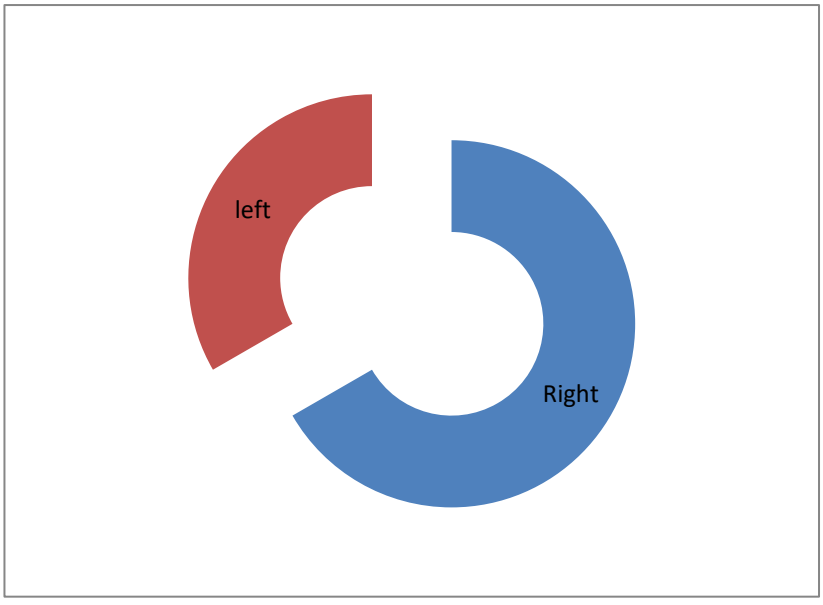


Fig2 Recurrent side of hernia

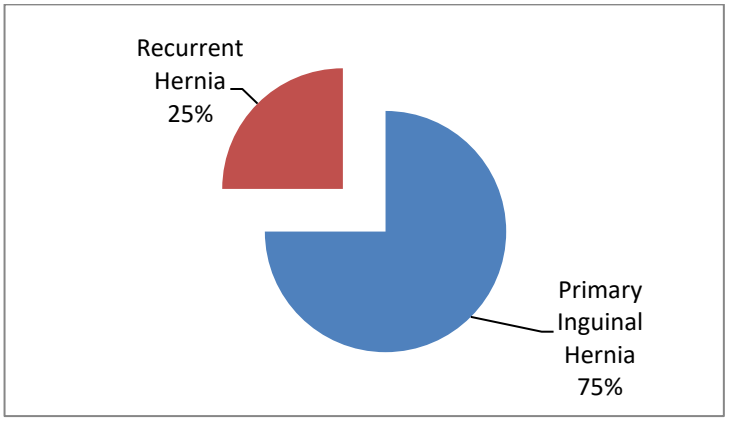


Figure 3: Type of hernia

When a weak spot in the body's muscular or connective tissue wall allows an internal organ or portion to protrude, the result is a hernia. While you might feel a bulge or swelling in your groin or abdomen, hernias sometimes don't present any symptoms at all. When you lie down, the lump may disappear or reappear. When you cough or strain, the bump may manifest as a lump. Hernias might develop as a result of PD. The pathophysiology posits that a weak abdominal wall experiences a mechanical impact from increased abdominal pressure. 7 Ages 46–60 were the most commonly impacted in this study, followed by 30-45. Balram et al.'s study, which found 42–50 years old to be the most prevalent age group in Jalaun, Uttar Pradesh, aligns with this. 8 Previous research by groups like Sayanna et al. and Basu et al. found comparable results. 9, 10 According to research by Kumar et al., hernias are more common in younger age groups; women and men between the ages of 20 and 49 appeared to bear nearly no hernia burden. Research revealed a lower prevalence of hernias in adolescents. 6 Some other research found bimodal peaks in the age groups of young and old. 11 Recurrent hernias were less prevalent than primary hernias in this study. Males outnumbered females in terms of the prevalence of both primary and recurring hernias. Other investigations, including those by Balram et al., Sayanna et al., Gulzar et al., and Ruhl et al., similarly found a male-to-female ratio. 7, 12, 13, The structural differences between the sexes, along with the fact that men tend to engage in more severe physical activity and weight lifting, may explain why men are more likely to suffer from hernias. 8 A majority of the patients (57.1%) presented to the OP with edema that was less than one year old. Kumar et al. found that 68% of patients experienced swelling for less than a year, which aligns with our findings. 6 The reason behind this is that the majority of patients wait until their pain or discomfort starts to interfere with their everyday activities before they seek medical help. The hernia typically reduces or pushes back into the abdomen when lying down or applying pressure. Strangulation, imprisonment, and blockage are problems that can arise from irreducible hernias. Following the left-side hernia, 48% of patients experienced a hernia on the right side. The number of patients observed with bilateral hernias was the lowest. Balram et al.'s study also revealed that the right side was the most common location for hernias. His study found that 6.9% of patients had hernias on both sides. Additional employees also reported similar outcomes. 14-16 Both sexes displayed the same level of dominance. Previously, researchers believed that the right side preponderance resulted from the testis descending later and the right vaginal process failing to close more frequently. 17, 18 Heavy weight lifting was the primary risk factor in this study (52.4%).Performing physically demanding tasks, such as lifting large objects, Exercise increases the pressure within the abdomen, potentially leading to a rupture. transversalis fascia fibers [18]. Apparently, not even one an event, typically a strain while lifting, can initiate the onset ,Moreover, inguinal hernia is not directly noticeable [20]. Research that was carried out according to Lau et al.'s research, a hernia running in the family was the most the development of an adult inguinal hernia is a pivotal element. people of the masculine gender [21]. Berg et al. [9] conducted the research. There is a complex genetic component to inguinal hernias. pattern of inheritance. According to studies conducted in the US, American nation Men had a greater prevalence of inguinal hernias. 13.9%, compared to 2.1% among females [22]. Next in line was gastrointestinal

distress, which occurred in 46.7% of instances. Other common causes of hernias include smoking and diabetes. A comparable study by Kumar R et al. revealed that lifting heavy objects caused hernias in 48.8% of the participants. Other common risk factors included smoking and persistent coughing. Employment for a large number of Numerous men participated in a variety of manual labor activities, including farming, construction, and industrial lifting. Coughing or straining increases the risk of inguinal hernia because they raise abdominal pressure. Researchers in the United States found that those who were older, heavier, taller, and lived in rural areas had a higher incidence of inguinal hernia.Their family history was another key factor contributing to the occurrence of hernias in patients. Other researchers, like Lau et al. and Junge et al., who looked at family histories of hernias to make predictions, agreed with this. 20,21 A patient's diet, existing health conditions, and lifestyle choices can all influence the likelihood of an inguinal hernia recurrence. 22

3. Conclusion

According to the research, primary and recurrent inguinal hernias are more common in middle-aged men than in middle-aged women. Primary risk factors include right-sided incidence, which is more common; straining or moving heavy objects; and irregular bowel movements. Their family history was another key factor contributing to the occurrence of hernias in patients.A patient's diet, existing health conditions, and lifestyle choices can all influence the likelihood of an inguinal hernia recurrence.

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