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A PROSPECTIVE STUDY ON RISK FACTORS AND COMPLICATIONS OF INGUINAL HERNIA

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Abstract: The protrusion of viscera or a part of it through a weak point in the abdominal wall is known as inguinal hernia. Inguinal hernia is the most common type among abdominal wall hernias. Inguinal hernias comprise 75% of all abdominal wall hernias. The purpose of the study is to identify risk factors as well as complications of inguinal hernia. Heavy weight lifting, smoking, previous hernia are significant risk factors for inguinal hernia. In our study, bowel obstruction and traumatic hernia were identified as major preoperative complications. It has shown that there is high recurrence rate of inguinal hernia if monitoring is not done properly. So, there is a need to create awareness about it for improving patient's quality of life. It was a prospective observational study. This study was conducted in the 'Department of Surgery' IP at Government general hospital, Ongole, a 750 bedded multi-disciplinary tertiary care hospital. Our study was performed in 156 patients. The prevalence, complications and risk factors towards disease progression was statistically analyzed by Descriptive analysis, Chi square test and One-way Anova. Out of 156 patients, 152 were Males and 4 were Females. The commonest age group was 41-60 groups. 123 cases were primary hernia and 33 were recurrent hernia. The commonest cause for the presence of hernia was heavy weight lifting and smoking. Period of swelling was less than 1 year for majority of patients, there was as strong clinical association between period of swelling and complications ($p<0.05$, using chi square test). Most of the patients were presented with bowel obstruction as preoperative complication. These types of studies need to be conducted in every geographical area so that it can be helpful for future studies in prediction of prevalence of inguinal hernia studies.

Index Terms **- Inguinal hernia, Open repair, Primary hernia, Prevalence, Recurrence, Mesh repair.**

I. INTRODUCTION

Inguinal hernia is defined as abnormal protrusion of viscera or a part of it through a weak point in the abdominal wall. The groin is the region between the abdomen and the thigh where an inguinal hernia arises. Inguinal hernia is the form of hernia where fat or a section of the intestine slides through a weak spot at the inguinal ring, the opening to the inguinal canal. A protrusion on one or both sides of the groin area is a sign of an inguinal hernia. An inguinal hernia can happen at any age, from childhood to maturity, and males are far more likely than females to get one. With time, inguinal hernia enlarges [1].

Approximately 70000 inguinal hernias are repaired in the National Health Service in England each year (90 percent elective and 10% emergency), affecting 0.14 percent of the population [2]. Due to the high prevalence of the disease, inguinal hernia repair is the most common procedure in general surgery, accounting for 10-15 percent of all operations [3].

Direct inguinal hernia: A protrusion through the triangle of hesselbech medial to the inferior epigastric arteries is referred as a direct inguinal hernia. These hernias form when the end of the abdominal fascia is exposed, due to a lack of overlaying muscle protection.

Indirect inguinal hernia: Indirect inguinal hernia occurs as a protrusion of abdominal contents through the internal ring, lateral to the inferior epigastric vessels, into the inguinal canal. Indirect inguinal hernias are situated within the spermatic cord and therefore may extend into the scrotum [4,5].

1.1 Etiology:

Congenital condition, Aging, Trauma and surgery, Strenous exercise such as Heavy weight lifting, Trauma and surgery, Chronic Obstructive Pulmonary Disease, Pregnancy, Constipation, Obesity, Ascites [6].

1.2 Risk factors:

Gender, Family history, Co morbidities, Chronic cough, Smoking, Chronic constipation, Heavy weight lifting, History of hernia [6,7,8,9].

1.3 Pathophysiology:

Indirect inguinal hernia is thought to be caused by the following: Passes through internal inguinal ring, traverses inguinal canal to external ring. May extend into scrotum in men and labia major in females. Has an oblique inferior course and passes lateral to the inner epigastric vessels. Associated with a patent processus vaginalis and considered as a congenital abnormality.

Directed inguinal hernia is thought to be caused by: Protrusion via the triangle of Hesselbach. Does not usually extend into the scrotum. It travels from the medial to the inferior epigastric vessels. Considered a congenital flaw [10].

1.4 Clinical manifestations:

A bulge on one or both sides of the groin that disappears when lying down, Pain in the groin, especially when lifting, coughing or exercising, A feeling of weakness, heaviness or burning in the groin, A swollen scrotum (the sac like a part of the male genitalia underneath the penis), A burning or aching sensation at the bulge, Discomfort in the abdomen or groin when lifting or bend over, Heartburn , A hard time swallowing, Shooting pain, Vomiting, Constipation, Pain and swelling around the testicles[11].

1.5 Complications:

1.5.1 Pre operative:

1.5.1.1 Bowel obstruction: Small intestinal blockage is most commonly caused by an abdominal wall hernia (10%–15%) (12). Colonic blockage due to a hernia in the abdominal wall is rare.

1.5.1.2 Incarceration: When a hernia can't be reduced or pushed back manually, it's called an irreducible hernia, and it's identified clinically. If the contents of a hernia become stuck in a weak spot in the abdominal wall, it can clog the intestine, causing extreme discomfort, nausea, vomiting, and the inability to pass gas or have a bowel movement [13].

1.5.1.3 Strangulation: Ischemia produced by a clogged blood supply is known as strangulation [14].

1.5.1.4 Trauma: Trauma may aggravate hernias in two ways: a hernia can be produced by trauma (traumatic hernia), or trauma can aggravate an existing hernia [15].

1.5.2 Post operative:

1.5.2.1 Recurrence of hernia: The most frequent consequence following hernia repair is hernia recurrence, which generally occurs 2–3 years after surgery [16,17].

1.5.2.2 Fluid collection: Fluid collections are common following hernia surgery in the initial postoperative period (up to 17 percent of cases) [16].

1.5.2.3 Infection: After hernia repair, infected postoperative fluid collections develop in 1–5% of patients [18] depending on the surgical method utilised and if the procedure was delayed. These complications are more common in older female patients, especially if strangulated and incarcerated hernias are repaired surgically [16].

1.5.3 Complications Associated with Meshes: Fibrosis of the tissues around the mesh may result from inflammatory responses. If the mesh has an asymmetric or uneven form on CT, this problem may be suspected.

Mesh shrinking is also possible. Intraperitoneal adhesions can form, putting you at risk for a minor intestinal blockage [16].

1.5.4 Other complications: Ischemia with testicular atrophy and thickening of the spermatic cord are examples of testicular problems that can arise following inguinal hernia treatment [18,16]. Other risks include vas deferens transaction or disruption, hydrocele, osteitis pubis, intestinal laceration, and nearby artery erosion and thrombosis [19,16].

II. RESEARCH METHODOLOGY

2.1 Population and Sample

156 cases were collected

2.2 Data and Sources of Data

Data was collected for a period of 6months i.e from Oct 2021 to Mar 2022. A well-structured patient data collection sheet was prepared and in which patient details were recorded. The patients who were admitted in IP were followed during their hospital stay. The details of the patient and complaints were done after the informed consent taken from the patient.

2.3 Method of study

Based on inclusion criteria the patient data such as demographics, disease history, associated factors, complications, surgical history (type, duration etc.) were collected in the data collection form. The risk factors were assessed based on surgical history and follow up was done for the recurrence status.

2.4 Statistical analysis

The prevalence, complications and risk factors towards disease progression was statistically analyzed by Descriptive statistics.

III. RESULTS AND DISCUSSION

Table 3.1: Categorization based on age and gender

Age group	Gender		Total no. of patient
	Male	Female	
<.18	0	0	0
18-40	12	9	21
41-60	79	40	119
60-80	14	2	12
Total	105	51	156

Table 3.1 displayed based on age wise characterization, 41-60 age group patients were most commonly affected because of their occupational status (Daily labour, farmers) followed by 61-75 years. Our study is supported by Veerabhadrappa et al;(2017), Muhammad et al;(2015) [20,21].

Table 3.2: Categorization based on risk factors

Risk factors	No. of patients	Percentage
Heavy weight lifting	117	75%
Smoking	61	39%
Previous hernia	32	20%
Constipation	25	16%
Family history	15	10%
Chronic cough	12	8%
Traumatic injury	5	3%
Congenital condition	4	3%
Sleep apnea	2	1%
Prior surgery	2	1%

Table 3.2 displayed on risk factors the main risk factor in present study was heavy weight lifting (75%) followed by smoking (39%). Previous history & constipation were other common reasons for hernia. The occupation of many of the persons was farming and Heavy weight lifting etc. These factors increase the abdominal pressure during cough or straining further increase the risk of Inguinal hernia. This is similar with other studies, in which inguinal hernia is mainly caused by strenous work i.e., Pradeep kumar et al; (2017) [22].

Table 3.3: Categorization based on clinical manifestations

Clinical manifestations	No of patients	Percentage
Swelling	156	100%
Pain	109	70%
Cough impulse	78	50%
Abdominal distension	12	7.6%
Constipation	42	27%
Vomiting	19	12.1%

Table 3.3 displayed on clinical manifestations, in our study, swelling is the common symptom (100%) followed by pain (70%).

Table 3.4: Categorization based on recurrence status

Type of hernia	No. of Patients	Percentage
Primary hernia	123	79%
Recurrent hernia	33	21%
Total	156	100%

Table 3.4 shows recurrence status of inguinal hernia here primary hernia was most common with 79% than recurrent hernia 21%. Similar study conducted by other researchers in which primary hernia is more common i.e., Rahul and Ravindranath et al; (2016) [23].

Table 3.5: Categorization based on gender, side and type of presentation

Gender	Right direct	Right indirect	Left direct	Left indirect	Bilateral direct	Bilateral indirect
Male	40	22	30	7	5	1
Female	20	11	10	7	2	1
Total	60	33	40	14	7	2

Table 3.5 shows out of 156 patients: In males- 60 were having right direct hernia, 33 were having right indirect hernia, 40 were having left direct hernia, 14 were having left indirect hernia, 7 were having bilateral direct hernia, 2 were having bilateral indirect hernia and in females: 2 were having right direct hernia, 1 were having right indirect hernia and 1 were having left indirect hernia. Our study was supported by Maj MLAkin et al;(1997) [24] and controversial to our study Ayesha and Mohammed et al;(2014) stated that indirect inguinal hernia more common than direct inguinal hernia [25].

Table 3.6: Categorization based on comorbidities

Comorbidities	No. of patients	Percentage
Hypertension	24	15%
Diabetes mellitus	15	10%
HTN+DM	9	6%
COPD	4	3%
Total	52	33.3%

Table 3.6 shows the common comorbid conditions presented in our study were Hypertension (15%) and Diabetes Mellitus (10%). This is similar with other studies i.e., Mukesh et al; (2013) [26].

Table 3.7: Categorization based on preoperative complications

Pre operative complications	No. of patients	Percentage
Bowel obstruction	15	10%
Traumatic hernia	10	7%
Trauma to pre- existing hernia	5	3%
Incarceration	5	3%
Strangulation	2	1%
No complications	119	76%

Table 3.7 shows very few subjects are presented with complications i.e., Bowel obstruction (10%) and Traumatic hernia. Controversial to the study Hari prasad and Teerthanath Srinivas et al;(2017) stated that incarceration and strangulation are the commonest one [27].

Table 3.8: Categorization based on post operative complications

Post operative complications	No. of patients	Percentage
Pain	156	100%
Mesh related complications	0	0%
Seroma	0	0%
Hematoma	0	0%

Table 3.8 displayed, among 156 patients we have taken for the study every patient experienced pain as post operative complication (100%). Our study was supported by Paras Kumar et al; (2020) [28]

Table 3.9: Categorization based on period of swelling

Period of swelling	No. of patients	No. of patients with complications
< 1 year	109	0
1-2 years	20	13
>2 years	27	24
Total	156	37

Table 3.9 displayed on period of swelling, In our study most of the patients (70%) had swelling for less than a year. This was in accordance with other studies i.e., Balamaddaiah and Rama Mohan Reddy et al; (2016) [29] and Veerabhadrappa et al;(2017) [20].

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