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**Original Research Article**

# Clinical study of hernia in females

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## ABSTRACT

**Background:** Abdominal wall hernia is the most commonly encountered clinical problem in the surgical setting and also the incidence of various types of hernias are known to have gender variations. This study was done to analyse the pattern of different types of hernia and their incidence in female patients.
**Methods:** This was a retrospective study done at Basaveshwara Teaching and General Hospital, Kalaburagi, Karnataka, India from January 2012 to December 2014. All the female patients who presented with different types of hernia like inguinal, umbilical, ventral, congenital and diaphragmatic hernias irrespective of the age have been included in the study from January 2012 to December 2014.
**Results:** In this study total of 87 cases of different types of hernias were studied including ventral, inguinal, umbilical and diaphragmatic hernias. Among which ventral hernias were the most common including 42 cases and among them one case presented as obstructed hernia and the most common age of incidence was 31-40 years. The next most common presentation was inguinal hernia with total of 29 cases and the paediatric age group (0-10 years) was the most common presentation. The next common hernia was umbilical hernia and the most common age of presentation was 21-40 years. The least common presentation was that of diaphragmatic hernia with only 4 cases, age of the patients being 60 and above.
**Conclusions:** In present study, most commonly encountered hernia was ventral hernia followed by inguinal, then umbilical and lastly diaphragmatic hernias.

**Keywords:** Diaphragmatic hernia, Female hernia, Inguinal, Ventral, Umbilical

## INTRODUCTION

Hernias have been extensively studied over the years owing to their relative frequency worldwide.[1] Over the years, hernia management has witnessed improvements with the development of several techniques. Most available studies on hernias are markedly skewed towards the assessment of the efficacy of these techniques with relatively fewer studies assessing other aspects of the subject of abdominal wall hernias.[2] One of such areas where there is relatively sparse information is the pattern of abdominal wall hernias relating specifically to gender. It is not unexpected to find variations in the pattern of hernia presentation and outcome of management between males and females owing to the anatomical, embryological and physiological differences that exist between them. Some of these have been left to speculations and assumptions with our search revealing very few published literature in this regard. This study set out to review the characteristics of female hernia patients with the aim of describing the demographics, pattern of abdominal wall herniation, mode of presentation and treatment.

## METHODS

This was a retrospective study conducted in 87 female patients who were admitted and operated at

Basaveshwara teaching and general hospital, Kalaburagi for different types of hernias.

All the female patients who presented with different types of hernia like inguinal, umbilical, ventral (incisional and non-incisional), congenital and diaphragmatic hernias irrespective of the age have been included in the study from January 2012 to December 2014. All the patients were operated either by mesh repair or without mesh, paediatric hernia cases were not operated until the age of two and later were treated by herniotomy.

## RESULTS

In the study of female hernias conducted from January 2012 to December 2014 most common hernia which was encountered was ventral hernia wherein 42 cases were treated followed by inguinal hernia wherein 29 cases were treated, followed by umbilical hernia wherein 12 cases were treated and lastly diaphragmatic hernia where only 4 cases were treated.

**Table 1: Type of hernia.**

| Type of hernia | Number of patients |
|---|---|
| Ventral | 42 |
| Inguinal | 29 |
| Umbilical | 12 |
| Diaphragmatic | 4 |
| Total | 87 |

### *Ventral hernia*

Among the ventral hernias noted the most common age group who underwent treatment belonged to the age group 31-40 years of age.

Of the 42 cases one case presented with symptoms of obstruction and was treated like obstructive hernia.

**Table 2: Distribution of ventral hernia.**

| Age in years | Number of patients |
|---|---|
| 0-10 | 0 |
| 11-20 | 0 |
| 21-30 | 3 |
| 31-40 | 14 |
| 41-50 | 7 |
| 51-60 | 11 |
| 60 and above | 7 |
| Total | 42 |

In our study, majority of the observed hernias were ventral hernia observed in the age group of 31-40 years and the most common etiology was either defect arising from a previous caesarean section or from tubectomy procedure (incisional hernia). Out of the 14 observed cases 10 of them had underwent caesarean section. The presentation of the 25 patients from the age group 40 and above combined had the highest incidence of incisional hernias. The most common etiology in these 25 patients above 40 years was hysterectomy and previous abdominal surgeries. Of the total 42 patients 38 of them were treated by only mesh repair and the rest 4 patients were treated by non-mesh repair.

### *Inguinal hernia*

Among the total of 29 cases of inguinal hernias noted the most common age group who underwent treatment belonged to the paediatric age group 0-10 years of age followed by second most common group of 31-40 years' age group.

**Table 3: Distribution of inguinal hernia.**

| Age in years | Number of patients |
|---|---|
| 0-10 | 12 |
| 11-20 | 0 |
| 21-30 | 3 |
| 31-40 | 7 |
| 41-50 | 3 |
| 51-60 | 1 |
| 60 and above | 3 |
| Total | 29 |

Of the total 29 cases 12 patients belonging to the age group 0-10 years underwent herniotomy and about 10 patients belonging to the age 21-40 underwent herniorrhaphy (Bassini's repair) and the rest 7 patients underwent hernioplasty.

### *Umbilical hernia*

Among the 12 umbilical hernias noted the most common age group who underwent treatment belonged to the age group 21-40 years of age and the majority of the patients were obese.

**Table 4: Distribution of umbilical hernia.**

| Age in years | Number of patients |
|---|---|
| 0-10 | 2 |
| 11-20 | 0 |
| 21-30 | 3 |
| 31-40 | 3 |
| 41-50 | 1 |
| 51-60 | 1 |
| 60 and above | 2 |
| Total | 12 |

Out of the 12 patients 6 were found to be obese. All the 12 patients were treated by mesh repair.

### *Diaphragmatic hernias*

Among the diaphragmatic hernias noted the most common age group who underwent treatment belonged to

the age group of 60 years and above. All the 4 patients underwent diaphragm defect closure by non-absorbable prolene sutures.

**Table 5: Distribution of diaphragmatic hernias.**

| Age in years | Number of patients |
|---|---|
| 0-10 | 0 |
| 11-20 | 0 |
| 21-30 | 0 |
| 31-40 | 0 |
| 41-50 | 0 |
| 51-60 | 0 |
| 60 and above | 4 |
| Total | 4 |

## DISCUSSION

The structural differences between males and females may cause variations in both frequency and pattern of hernias. This includes differences in the bony pelvis, the musculofascial layers of the lower abdomen and the descent of the gonads from the retroperitoneum.[3] The embryological basis for the development of inguinal and umbilical hernias explains why these were the only hernia types found in patients less than 20 years.

Generally, inguinal hernias have been known to be the commonest hernia type irrespective of gender with umbilical, epigastric and femoral hernias ranking next.[4] It is however noteworthy that ventral hernia (incisional hernia) is the most commonly encountered hernia in this study and in fact more frequent than inguinal hernias. This perhaps underscores the difference in the pattern of hernias observed in females compared with what is generally observed.[4]

It may also be a reflection of the increase in the number of surgical operations, particularly obstetric and gynaecological surgeries which are common in this group of patients. Most studies that have evaluated incisional hernias have also reported a higher incidence in women with majority occurring following obstetric surgeries.[5,6] Being a preventable type of hernia, the possibility of its occurrence as a complication of surgery must be taken into consideration and efforts made to prevent its occurrence as much as possible as the number and magnitude of surgical operations continue to increase.

### *Ventral hernia*

Hernias of the anterior abdominal wall, or ventral hernias, represent defects in the parietal abdominal wall fascia and muscle through which intra-abdominal or preperitoneal contents can protrude. Ventral hernias may be congenital or acquired. Acquired hernias may develop via slow architectural deterioration of the musculoaponeurotic tissues, or they may develop from failed healing of an anterior abdominal wall incision (incisional hernia). The most common finding is a mass or bulge, which may increase in size with Valsalva. Ventral hernias may be asymptomatic or cause a considerable degree of discomfort and will generally enlarge over time. Physical examination reveals a bulge on the anterior abdominal wall that may reduce spontaneously, with recumbency, or with manual pressure. A hernia that cannot be reduced is described as incarcerated and generally requires surgical correction.

Incarceration of an intestinal segment may be accompanied by nausea, vomiting, and significant pain, and is a true surgical emergency. If the blood supply to the incarcerated bowel is compromised, the hernia is described as strangulated, and the localized ischemia may lead to infarction and perforation. Primary ventral hernias (non-incisional) are generally named according to their anatomic location. Epigastric hernias are located in the midline between the xiphoid process and the umbilicus. They are generally small and may be multiple, and at elective repair, they are usually found to contain omentum or a portion of the falciform ligament. These may be congenital and due to defective midline fusion of developing lateral abdominal wall elements.

Incisional hernia is herniation through a weak abdominal scar (scar of previous surgery). It is common in old age and obese individuals. It occurs in 10% of abdominal surgeries; The etiology of any given case of incisional hernia can be difficult to determine.

- Obesity
- Primary wound healing defects
- Multiple prior procedures
- Prior incisional hernias
- Technical errors during repair may all be contributory.

Repair of incisional hernias can be technically challenging, and a myriad of methods have been described. The most important distinctions in surgical management of incisional hernias are primary versus mesh repair and open versus laparoscopic repair. Primary repairs of incisional hernia include both simple suture closure and components separation. Primary repair by simple suture approximation, even for small hernias (defects <3 cm), is associated with high reported hernia recurrence rates. In a randomized prospective study of open primary and open mesh incisional hernia repairs in 200 patients, investigators from the Netherlands found that after 3 years, recurrence rates were 43% and 24%, respectively.

Risk factors for recurrence were:

- Primary suture repair
- Postoperative wound infection

The use of either permanent implant or biologic materials with components separation may lead to a hernia recurrence rate as low as 4% at 1 year of follow-up. Mesh

repair has become the standard in the elective management of most incisional hernias. Mesh can be placed as an underlay deep to the fascial defect (intra- or preperitoneal), an interlay either bridging the gap between the defect edges or within the abdominal wall musculoaponeurotic layers (intraparietal), or an onlay (superficial to the fascial defect). Laparoscopic repairs use an underlay technique.

***Umbilical hernia***

The umbilicus represents a midline opening in the linea alba. Umbilical hernia occurs when the umbilical scar closes incompletely in the child or fails and stretches in later years in the adult patient. The hernia becomes readily apparent once the abdominal contents move through the umbilical opening given the relative lack of soft tissue in the anterior body wall at the site of the umbilicus.

Umbilical hernias have been documented throughout history with the firrst references dating back to the ancient Egyptians with the first known record of a surgical repair by Celsus in the first century AD. Mayo in 1901 reported the first series of patients to undergo the classic overlapping fascia operation through a transverse umbilical incision using nonabsorbable suture.[7]

The incidence of umbilical hernia in the adult is largely unknown but most cases are thought to be acquired rather than congenital. It is known to occur more commonly in adult females with a female:male ratio of 3:1. Umbilical hernia is also more commonly found in association with processes that increase intra-abdominal pressure, such as pregnancy, obesity, ascites, persistent or repetitive abdominal distention in bowel obstruction, or peritoneal dialysis. The etiology of umbilical hernia in the adult may be multifactorial, with increased intra-abdominal pressure working against a weak or incomplete umbilical scar.

Umbilical hernias occur at the umbilical ring and may be present at birth or develop later in life. Umbilical hernias are present in approximately 10% of all newborns and are more common in premature infants. Most congenital umbilical hernias close spontaneously by 5 years. If closure does not occur, elective surgical repair is usually advised. Adults with small, asymptomatic umbilical hernias should be followed clinically.

Surgical treatment is offered if a hernia is observed to enlarge or is associated with symptoms, or if incarceration occurs. Surgical treatment can consist of primary sutured repair or placement of prosthetic mesh for larger defects (>2 cm) using open or laparoscopic methods.

Patients with advanced liver disease, ascites, and umbilical hernia require special consideration. Enlargement of the umbilical ring usually occurs in this clinical situation as a result of increased intra-abdominal pressure from uncontrolled ascites.

***Inguinal hernia***

The word "hernia" is derived from a Latin term meaning "a rupture." The earliest reports of abdominal wall hernias date back to 1500 BC. The first evidence of operative repair of a groin hernia dates back to the first century. The original hernia repairs involved wide operative exposures through scrotal incisions requiring orchiectomy on the involved side. The first report of groin hernia classification based on the anatomy of the defect (i.e., inguinal versus femoral) dates back to the 14th century, and the anatomical descriptions of direct and indirect types of inguinal hernia were ¬ first reported in 1559.

*Etiology*

- Straining.
- Lifting of heavy weight.
- Chronic cough (tuberculosis, chronic bronchitis, bronchial asthma, emphysema).
- Chronic constipation (habitual, rectal stricture).
- Obesity.
- Pregnancy and pelvic anatomy (especially in femoral hernia in females).
- Appendicectomy through McBurney's incision may injure the ilioinguinal nerve causing right sided direct inguinal hernia.

The treatment option for inguinal hernia in pediatric population includes herniotomy and in adults in adults it includes herniorrhaphy or hernioplasty depending on the age, abdominal muscle tone and the defect size.

***Diaphramatic hernia***

*Morgagni hernia[8]*

The hernia of Morgagni is an anterior, retrosternal diaphragmatic defect, occurring between the xiphoid and the costochondral attachments of the diaphragm. Relatively rare, this embryologic failure of myoblast migration accounts for less than 1 in 50 cases of diaphragmatic defects. With this defect, abdominal contents tend to herniate on the patient's right, with the left-most aspect of the defect occupied by pericardium. While this congenital defect is present at birth, symptoms are relatively minor, and, oftentimes, patients do not present until adulthood. Increased abdominal pressure, such as with obesity or pregnancy, tends to precipitate increased symptoms, frequently leading to the diagnosis. These symptoms may range from vague fullness to bowel obstruction, and in some patients the defect may be identified incidentally upon radiographic evaluation performed for unrelated indications.

Following reduction and resection of the hernia sac, repair of the diaphragm is performed. The defect may, potentially, be closed primarily if there remains a reasonable margin of muscular tissue around the defect. Closure is performed with heavy nonabsorbable suture placed in an interrupted fashion. In the absence of a complete muscular rim, the defect will require attachment of the free muscle edge to the co stal margin.

One should also note that if a primary repair results in excessive tension, non-absorbable mesh or a polytetrafluoroethylene (PTFE) patch should be placed to close the defect between the diaphragmatic rim and the chest wall. If the pleural space is entered, a chest tube should be placed at the end of the procedure.

*Bochdalek hernia*[8]

Congenital failure of the closure of the pleuroperitoneal canal results in a posterolateral diaphragmatic defect, permitting herniation of the foregut structures as they return into the abdominal cavity. Most these defects tend to be left sided (>85%), and they are often associated with significant cardiac anomalies.

Major morbidity results from the space occupation in the chest by the abdominal organs, ultimately hindering normal lung development. The subsequent pulmonary hypoplasia renders many of these patients critically ill, during the delivery and neonatal periods, ultimately causing substantial morbidity and mortality. Diagnosis is typically made by prenatal ultrasound, which facilitates advanced planning for delivery, perinatal care, and operative intervention. Postnatal diagnosis is most often made after chest radiography demonstrates intestinal contents in the thoracic cavity.

The operative procedure is performed through a subcostal abdominal incision, and, after facilitating appropriate exposure, the hernia contents are gently reduced. Hernia sacs are present in a minority of cases, but should be uniformly sought and resected if present. Edges of the defect should be identified, and an assessment should be made regarding feasibility of primary repair, which should only occur in the setting of adequate tissue that can be brought together without tension.

Some of the acquired defects include hiatal hernias. As per the study done by Olasehinde O et al inguinal hernias were the most common followed by ventral hernias but in our study majority of the observed hernias were ventral hernias (incisional hernia) were observed in the age group of 31-40 years and the most common etiology was either defect arising from a previous caesarean section or from tubectomy procedure. And the age group 41-60 years and above had an etiology of undergoing hysterectomy or other previous abdominal surgeries.

## CONCLUSION

In present study which was carried out for a period of three years' majority of the cases were ventral hernias (incisional) and most of them had obstetric and gynaecological interventions either in the form of caesarean section or hysterectomy or tubectomy or previous abdominal surgeries. Among ventral hernias (incisional) which were studied its higher incidence can be attributed to the usage of absorbable suture material, midline abdominal incisions, faulty technique of closure, poor nutritional status of the patient, presence of cough, tuberculosis, jaundice, anaemia, hypoproteinaemia. And these can be prevented to some extent by using Pfannensteil incision, non-absorbable suture material, good antibiotics to prevent post-operative wound infection and improving the nutritional status.

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