

# A Study of Abdominal Wall Hernias and Its Management

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## Abstract

**Introduction:** Hernia is defined as the gap in the continuity of the fascia. The most common types of hernia are inguinal (inner groin), incisional (resulting from an incision), femoral (outer groin), umbilical (belly button), and hiatal (upper stomach).

**Aim:** The aim of the study was to study the various risk factors and complications of different types of hernias, clinical presentations, and their management.

**Materials and Methods:** All cases of abdominal wall hernias presenting above 12 years of age were included in the study. Patients were assigned to undergo suture repair or mesh repair at the operating surgeon's discretion. All patient-related data were collected for analysis.

**Results:** Among the 185 cases studied, 86 were incisional hernia (46.4%), 75 were umbilical hernia (40.5%), and 21 were epigastric (11.3%), one Spigelian, and two lumbar hernia. Female preponderance was seen in incisional hernias with male to female ratio of 1:6.7. The swelling was the most common complaint in 55% followed by pain 31.6. Previous surgery or trauma was the single most important cause for ventral (Incisional) hernias. Simple suture repair and or Mayo's repair was the choice of repair in emergencies in all age groups.

**Conclusion:** Size of the defect and presence of complications are the guiding factors for choosing the type of repair. Laparoscopic approach for ventral hernia repair is definitely a method of choice with the advantages of good operative field visibility, lessened duration of hospital stay, and minimal post-operative scar.

**Key words:** Hernioplasty, Incidence, Incisional hernia, Mesh repair

## INTRODUCTION

Abdominal wall hernias are familiar with surgical problems. Abdominal wall hernias are those that appear through the layers of abdominal walls at sites of weakness. They occur both due to congenital and acquired defects. Hernias commonly cause pain and are esthetically distressing to patients. This coupled with the risk of incarceration, is the most common reason patient seeks surgical repair of hernias. Advances in the basic and clinical sciences have allowed a better understanding of the pathophysiology of hernia formation. The field of hernia repair has evolved as a

result of surgical innovation and has benefited significantly from technological improvements.<sup>[1]</sup>

Tension-free repair is one of the key concepts that have revolutionized hernia surgery. The use of mesh prosthesis to approximate the fascial defect has resulted in a decrease in recurrence rates for inguinal and incisional hernias. More recently, laparoscopic approaches to the inguinal and incisional hernia have extended the options and approaches for repairing the fascial defect. However, large abdominal incisions and wide tissue dissection with the creation of large flaps often lead to a high incidence of post-operative morbidity and wound complications. Nowadays, open ventral herniorrhaphy has been challenged by reports of the successful implementation of minimally invasive techniques. The benefits of laparoscopic ventral hernia repair include a faster convalescence, fewer complications, and, most important, a low recurrence rate.<sup>[2-4]</sup>

The Stoppa repair used a large mesh in the preperitoneal space to support the fascial defect, which is the concept

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upon which the laparoscopic inguinal hernia repair is based. Contemporary repair of abdominal wall hernias is supported by strong evidence and calls for a tension-free repair with placement of mesh in the majority of cases. Laparoscopic repair demands significant expertise to achieve outcomes comparable with those of open repair. In ventral incisional hernias, placement of the mesh in a sublay position has been found to be effective and to have a low recurrence rate, although randomized trials have not been performed.<sup>[4]</sup>

An incisional hernia, a late complication of laparotomy, still lacks an evidence-based prophylactic approach. Postoperatively, incisional hernias occur due to multiple factors. Pre-operative comorbidities belong to these risk factors. There is a range of studies comparing the techniques of surgical wound closure, suture materials differences, and newer techniques of repair.<sup>[5,6]</sup>

### Aim

The aim of the study was to study the various risk factors and complications of different types of hernias, clinical presentations, and their management.

## MATERIALS AND METHODS

This prospective observational study was conducted in the Department of Surgery, Tirunelveli Medical College and Hospital. This study was based on the analysis of cases of abdominal wall hernias observed from January 2011 to September 2012. The study accounts for all the cases of abdominal wall hernias that were diagnosed and treated both electively and emergency. Ethical committee clearance obtained. Consent was obtained from all patients. A simple random sampling was done for selecting the patients.

### Inclusion Criteria

All cases of abdominal wall hernias presenting above 12 years of age were included in the study.

### Exclusion Criteria

Age <12 years, patients with inguinal and femoral hernias were excluded from the study.

The patient's related factors, namely age, sex, multiparity, obesity, cough/chronic obstructive pulmonary disease, constipation, prostatism, diabetes mellitus, hypertension, steroid therapy, consumption of tobacco and alcohol, past surgical history were recorded. A master chart has been made recording relevant history and findings of personally studied 185 cases of ventral hernia. Routine investigations, namely, hematology, urine examination, chest X-ray, electrocardiography, ultrasound abdomen, and pelvis for all patients and other special investigations were done for associated diseases wherever required.

As clinical diagnosis was made, patients with medical illnesses were appropriately treated to attain near-normal parameters before surgery. At the induction of anesthesia, the prophylactic dose of antibiotic (1<sup>st</sup> generation cephalosporin) was given. Patients were assigned to undergo suture repair or mesh repair at the operating surgeon's discretion.

In suture repair, continuous stitches with stitch width and interval approximately 1 cm were put using polypropylene (Prolene no. 1-0). In mesh repair, Prolene mesh was used with at least 4 cm of mesh overlapping the approximated edges of the fascial defect and secured with no. 1 Prolene interrupted stitches over the fascia. A suction drain was used for all patients with incisional hernia and drain removed 48–72 h interval or when drain decreased. Sutures were removed on 8 post-operation day.

Particular attention was given to study various aspects of ventral hernias such as:

- Distribution of ventral hernias with respect to age and sex of the patient
- Types of hernia
- The period between the previous surgery and the development of incisional hernia
- Etiological/predisposing factors for the development of ventral hernias
- Common presentations
- Exact location and size of the defect
- Various surgical options for the management of ventral hernias
- Complications in the perioperative period
- Follow up done at 1, 6, 12, and 18 months of the interval following surgery.

## RESULTS

Among the 185 cases studied, 86 were incisional hernia (46.4%), 75 were umbilical hernia (40.5%), and 21 were epigastric (11.3%), one Spigelian, and two lumbar hernia.

### Incisional Hernia

In 86 incisional hernia cases, 50% were home workers, 36% moderate workers, and 14% heavy workers. The incisional hernia was common in third to the fifth decade, 11 were males and 75 were female. Of the 86 cases, 46 cases were with <25 body mass index (BMI), this shows, obesity does not influence incision hernia occurrence. Almost all cases had swelling to present with, but presentation as the swelling was in 51 cases, pain in 25 cases, both in 10 cases. Of the 86 cases, 25 were cesarean section (29%), 14 were lap sterilization (16.3%), 8 were puerperal sterilization (9.3%), 8 were hysterectomy (9.3%) 20 were

laparotomies (23.2%), 4 were appendectomy (4.6%), 2 were cholecystectomy (2.3%), 1 was bone graft from iliac crest (1.2%), 1 was at Rt lumbar drain site (1.2%), and 3 were recurrent incisional hernia (3.4%).

In gynec surgeries, lower midline incision was predominantly used (23.2%) followed by Pfannenstiel incision (15%) and lower transverse incision.

Of 86 cases, 42 cases had onset after 5 years of surgery (48.8%), 21 it between 2 and 5 years (24.4%), and 23 cases developed within 2 years of surgery. In 86 cases, 22 cases had large defects of over 6 cm diameter (26%), 24 had small defect of <3 cm (28%), and 40 cases had average defect of 3–6 cm (46%). These 2 cases of wound infections and 3 cases of recurrence noted postoperatively.

### Epigastric Hernia

Of the 21 cases, 17 were male (81%) and 4 were female (19%); 8 cases, 38% were BMI <25%; and, 13 cases, 62% were BMI >25%. All the cases had swelling but the presenting symptom was found only in 6 cases (34%). The major presentation was a pain in the epigastric region 14 cases (66%). Most of the cases were electively treated but for one case that was taken up for irreducibility as an emergency. Most epigastric hernias are found to have multiple defects along the linea alba 15 cases (71.4%), only 6 cases had a single defect. Most of the cases were with defect 3–6 cm (57%), >6 cm (5%), and <3 cm (4%). Of the 21 cases, 5 cases were anatomically repaired (23.8%), others were repaired by meshplasty.

### Umbilical Hernias

Of the 75 cases, pure umbilical swelling was present in 36 cases (48), more common in female 33 cases (44%), males 42 (56%), 55 cases, 72% were BMI <25%, and 20 cases 28% BMI >25%. Mostly presented for elective surgical repair, of the 75 cases, 7 cases were taken up for emergency surgery (5 – irreducible and 2 – obstruction). All patients had swelling of which only 45 cases had it as a presenting complaint (66%), the pain was the next presenting complaint in 25 cases (33.3%), 5 other patients came for cosmetic surgery. There were defects of 3–6 cm size in most patients 42 cases, <3 cm in 25 cases, and >6 cm in 8 cases. Of the 75 cases, 13 cases were given anatomical repair (17.3%), Mayo's repair was done in 12 cases (16%), rest were given mesh repair.

### Spigelian hernia

One case of 35-year female presented with pain abdomen 1 year duration, swelling for 1 week, diagnosed clinically as Spigelian hernia. Ultrasonography showed a defect in

the left side of umbilicus of 5 cm × 3 cm. Treated by mesh repair.

### Lumbar hernia

Two cases – males of age 35, 46 presented with the swelling lumbar area in the superior triangle treated by mesh repair.

## DISCUSSION

Ventral hernias: Incidence is second only to inguinal hernias, accounting for 25–35% of all hernias. Ventral hernias include incisional and primary defects in the abdominal fascia, which can cause umbilical, epigastric, or Spigelian hernias. Incisional hernias account for 80% or more of ventral hernias that surgeons repair. The prevalence of incisional hernias after laparotomy is 2–11% and increases substantially when certain risk factors for post-operative incisional hernia, such as a wound infection or obesity, in our study, incisional hernias accounted for 46.4% of ventral hernias. About 40.5% were umbilical hernia, 11.4% were epigastric hernias.<sup>[7]</sup>

Toms *et al.*<sup>[8]</sup> says midline incision through the relatively avascular linea alba contributes more than transverse incision, especially where muscle splitting approaches are been used. Carlson found a 10.5% ventral hernia rate in 4129 midline incisions compared with a 7.5% rate for transverse incision and a 2.5% rate of paramedian incision.<sup>[9]</sup>

Korenkov *et al.* says that incisional hernia can occur after all types of abdominal surgery and the risk lies between 11 and 15% after midline laparotomy and 0.2–1.2% after laparoscopy.<sup>[10]</sup>

Incisions	Present study		Bose <i>et al.</i> <sup>[11]</sup>		Ríos <i>et al.</i> <sup>[12]</sup>	Balén <i>et al.</i> <sup>[13]</sup>
	n	%	n	%	%	%
Vertical	40	46.5	91	82.72	-	-
IU	20	23.2	35	38.46	36	9.1
SU	20	23.2	0	0	16	20.6
Transverse	14	16.27	0	0	-	6.89
McBurney	3	3.4	19	10.86	-	2.29
Subcostal	2	2.3	0	0	6	2.29
Pfannenstiel	13	15	-	-	-	2.29

Cassar and Munro observed incisional hernia as a bulge visible and palpable swelling when the patient is standing and often requiring support or repair.<sup>[6]</sup> Toms *et al.* said that abdominal wall hernias may be asymptomatic or present with a life-threatening emergency.<sup>[8]</sup>

Incisional hernia presents with pain, complications such as incarceration (6–15%) or strangulation of the bowel (2%) (van't Riet *et al.* 2002).<sup>[14]</sup> Usually, an asymptomatic bulge noticed by the patient or a bulge directly over the incision

or in an adjacent area locally related to the incision is the presentation (Millikan, 2003).<sup>[15]</sup>

The major cause of post-operative herniation is wound infection as leads to fascial necrosis with resultant loss of integrity of the closure (Bucknal *et al.* 1982).<sup>[16]</sup>

In Balén *et al.* study, 4% seroma, 4% ileus, and 2% fistula.<sup>[13]</sup> In a review of 3107 incisional hernia repairs, Heydorn and Velanovich reported that the mortality rate was appreciably higher in patients undergoing repair of complicated hernias (1.1%) than in those individuals undergoing elective repair (0.3%).<sup>[17]</sup>

S. No.	Reference year	Type of repair	No of pt.	Recurrence%	Follow-up in months
1	Liakakos <i>et al.</i> 1994 <sup>[18]</sup>	Suture	53	25	90
		Mesh	49	8	90
2.	Schumpelick <i>et al.</i> 1996 <sup>[19]</sup>	Suture	190	33	64
		Mesh	7	7	64
3.	Clark 2001 <sup>[20]</sup>	Suture	13	38	25
		Mesh	8	25	13
4.	Luijendijk <i>et al.</i> 2000 <sup>[21]</sup>	Suture	97	46	26
		Mesh	84	23	26
5.	Korenkov <i>et al.</i> 2002 <sup>[22]</sup>	Suture	33	12.12	16
		Mesh	39	7.69	16
6.	Our study	Suture	24	0.01	6–18
		Mesh	62	0.01	6–18

## CONCLUSION

Ventral hernias were common surgical problems second only to groin hernias. Most of the incisional hernias developed >5 years of previous surgery. Swelling, pain, and complications along with esthetic concerns are the causes for seeking a surgical solution. Most of the ventral hernias were uncomplicated at the time of presentation, remaining presented with either obstruction or strangulation necessitating emergency repair. Incidence of incisional hernias was more in females with male to female ratio of 6.7:1, while epigastric and umbilical hernias were more common in males with a male to female ratio of 4:1 and 1.2:1, respectively. Size of the defect and presence of complications are the guiding factors for choosing the type of repair. Laparoscopic approach for ventral hernia repair is definitely a method of choice with the advantages of good operative field visibility, lessened duration of hospital stay, and minimal post-operative scar.

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