



A Study on Management of Adult Ventral Hernias

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Abstract:

Background: 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. With a life incidence rate of 10%, although $\frac{3}{4}$ of that is inguinal hernia, hernia repair has an enormous impact on the health of the individual, on society and health economics and thus deserves interest. Ventral hernias are one of the most common problems confronting general surgeons. They can be treated surgically by procedure ranging from open anatomical repair to hernioplasty to minimally invasive techniques like laparoscopy and advanced techniques like robotic surgery. Despite this, there are no guidelines on the best surgical management.

Methods: This is a prospective observational study done in cases either clinically or radiologically confirmed cases of ventral hernia.

Results & Conclusion: 96 cases of adult ventral hernia which were admitted in Narayana Medical College, Nellore during December 2016 to November 2018 were studied showed highest incidence in the age group ranging from 31 years to 50 years & incisional hernia is most common among them with female to male ratio of 1: 0.8. Obesity being a common risk factor for all ventral hernias. The most common content of the hernia sac being omentum followed by intestinal loops, while 90 % of the ventral hernias had single defect only.

I. INTRODUCTION

“No disease of the human body, belonging to the province of the surgeon, requires in its treatment, a better combination of accurate, anatomical knowledge with surgical skill than hernia in all its varieties” - Sir Astley Paston Cooper Anatomy and Surgical Treatment of Inguinal and Congenital Hernia, Cox, London, 1804. 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⁽¹⁾.

These defects can be categorized as spontaneous or acquired or by their location on the abdominal wall⁽²⁾. With a life incidence rate of 10%, although $\frac{3}{4}$ of that is inguinal hernia, which is not a topic of this thesis, hernia repair has an enormous impact on the health of the individual, on society and health economics and thus deserves interest⁽³⁾. Among all abdominal wall hernias, incisional hernias are common second to groin hernias whereas umbilical and epigastric constitute 10%⁽²⁾. Incisional hernias are two times more common in women than men⁽²⁾. Incisional hernia is a common long-term complication of abdominal surgery and is estimated to occur in 11–23% of laparotomy incisions^(4 - 6). The incidence of ventral hernia after midline laparotomy ranges from 3% to 20% and doubles if the operation is associated with a surgical site infection⁽²⁾.

Ventral hernias are one of the most common problems confronting general surgeons. They can be treated surgically by procedure ranging from open anatomical repair to hernioplasty to minimally invasive techniques like laparoscopy and advanced techniques like robotic surgery. Despite this, there are no guidelines on the best surgical management. As this is one of the very common conditions presenting to our hospital, there is a

need to study the disease to know the various presentation and also to determine the best modality of treatment in our set-up.

AIMS AND OBJECTIVES

Aim of the study:

The aim of this dissertation is to study the ventral hernias in relation to the clinical presentation, risk factors, complications as well as their management.

Objectives of the study:

- 1) To study ventral hernias with respect to location and clinical modes of presentation.
- 2) To study risk factors of ventral hernias.
- 3) To study the complications of ventral hernias at the time of presentation.
- 4) To study the management protocol adopted in our institution.

II. MATERIALS AND METHODS

This was a hospital based prospective observational study. All adult patients presenting to the department of general surgery with either clinically or radiologically confirmed cases of ventral hernia were considered as subjects of this study.

Inclusion criteria:

- All patients aged above 18yrs who were diagnosed with ventral hernias that were admitted in general surgical ward of NMCH during the period of December 2015 to June 2017.

Exclusion criteria:

- Patients aged below 18yrs.
- Patients who were diagnosed with groin hernia.
- Patients who were not operated or not taken for surgery for any other reason.

Consent was obtained from all the subjects participating in the study. They were informed about the structure and purpose of the study and that the information will be used only for academic purpose.

Institutional ethics committee approval was obtained before conducting the study.

Sample size was calculated using

$$n = Z^2PQ / d^2$$

{n = Sample size, Z= Z score value representing confidence interval, p = Prevalence of a factor in the population, q = (1-p) / (100-p), d = error allowed} Cochran equation for unknown population gave a sample size of 96. All patients were clinically examined for confirmation of ventral hernia.

Following data was recorded:

1. Patient demographics
2. History of smoking
3. BMI
4. Clinical presentation: swelling alone, pain alone, both swelling and pain
5. Complications: Irreducibility, obstruction or strangulation

Body Mass Index was divided into four categories:

1. A BMI below 18.5 was considered underweight.
2. A BMI of 18.5 to 24.9 was considered normal.
3. A BMI of 25 to 29.9 was considered overweight.
4. A BMI of 30 or higher was considered obese.

All patients were subjected to ultrasound abdomen to know the size of the defect and contents of the sac preoperatively.

Intra - operative findings like single or multiple defects, contents of the sac were noted.

The patients were divided into 3 groups based on size of the defect according to EHSCVH.

Having obtained the data anatomical repair as well as hernioplasty was done based on type of hernia, location of hernia, size of the defect and as per patient's or surgeon's preference.

Hernioplasty was done using prolene mesh. Whenever mesh was used, placement of the mesh was done by sub-lay or on-lay technique as per the choice of the surgeon. Mesh was secured with prolene sutures.

The data collected was analyzed by applying appropriate methods.

III. RESULTS

In the present study, 96 cases of ventral hernia were studied and following observations were noticed.

Table.1. Age Distribution:

Age group (yrs)	Number of pts (n=96)	Percentage (%)
21-30	8	8.33
31-40	17	17.70
41-50	24	25
51-60	28	29.16
61-70	17	17.70
>71	2	2.08
Total	96	100

Table.2. Sex Distribution:

Sex	Number of patients (n=96)	Percentage (%)
Female	52	54.17
Male	44	45.83
Total	96	100

CLINICAL PRESENTATION:

Table.3. Types of Ventral Hernia

Anatomical site	No. of patients (n=96)	Percentage (%)
Incisional	41	42.71
Umbilical	32	33.33
Epigastric	15	15.63
Para umbilical	6	6.25
Recurrent incisional	2	2.08

Table.4. Presenting Complaint

Presentation	No. of patients (n=96)	Percentage (%)
Pain	6	6.25
Swelling	84	87.50
Swelling +pain	6	6.25

Table.5. Complications:

Complication	No. of patients (n=96)	Percentage (%)
Irreducibility	5	5.20
Obstruction	1	1.04

RISK FACTORS:

Table.6. No. of Smokers

Smoking history	No. of patients (n=96)	Percentage (%)
No	68	70.83
Yes	28	29.17
Total	96	100

Table.7. Obesity

BMI group	No. of patients (n=96)	Percentage (%)
Underweight	0	0
Normal	11	11.46
Overweight	44	45.83
Obese	41	42.71
total	96	100

Table.8. Contents of the Hernial SAC:

Contents of sac	No. of patients (n=96)	Percentage (%)
Bowel loops	19	19.79
Omentum	64	66.67
Omentum +bowel loops	4	4.17
Pre peritoneal fat	8	8.33
Pre peritoneal fat + omentum	1	1.04

Table.9. Number of Abdominal Wall Defects:

No. of defects	No. of patients (n=96)	Percentage (%)
Singles	86	89.58
Two	7	7.29
Three	3	3.13

Table.10. Size of Abdominal Wall Defects:

Size of the defect	No. of patients (n=96)	Percentage (%)
<2 cms	28	29.78
>2-4 cms	37	39.36
>4 cms	29	30.85

Table.11.Types of Hernia Repair:

Types of hernia repair	No. of patients (n=96)	Percentage (%)
Anatomical repair	5	5.20
Sub lay hernioplasty	1	1.04
On lay hernioplasty	88	91.6
On lay hernioplasty + abdominoplasty	2	2.08

IV. DISCUSSION

In the present study, 96 cases of ventral hernia were studied and following observations were noticed.

AGE DISTRIBUTION:

In the present study, the mean age of presentation was 49.1 years ranging from 21 years to 73 years. Highest incidence was seen between 41-60yrs; lowest incidence was seen after the age of 70yrs.

SEX DISTRIBUTION:

In the present study, 54.17% patients were female and 45.83% patients were male with a male to female ratio of 0.8:1.

Table-12: Sex distribution of patients in this study

Sl.No	Sex	Percentage of patients
1	Male	45.83
2	Female	54.17

DISTRIBUTION OF LOCATION OF VENTRAL HERNIAS:

In this study of 96 cases of ventral hernia, 43/96 (44.79%) were incisional hernia; 32/96 (33.33%) were umbilical hernia; 15/96 (15.63%) were epigastric hernia and 6/96 (6.25%) were paraumbilical hernia. 2 cases were of recurrent incisional hernia. In the present study, incisional hernia was the most common amongst the ventral hernias followed by umbilical and epigastric hernias.

CLINICAL PRESENTATION:

Majority of the patients (94%) presented with reducible swelling around the umbilicus or the epigastric region or in the line of incision; of which 6.6% presented with swelling associated with pain and 6.25% presented with pain alone without any visible swelling in the present study.

This data confirms that most common presentation of ventral hernia is swelling associated with or without pain. Out of 96 patients studied, 5 (5.20%) patients (3-umbilical, 1- incisional, 1- epigastric) presented with irreducible swelling. All the patients with irreducible hernia presented with swelling and pain. Only one patient presented with obstruction. He was a 41 year old obese male with umbilical hernia. This may be because of the narrow neck of umbilical hernia in addition to increased intra-abdominal tension and abdominal wall weakness due to obesity.

V. RISK FACTORS:

SMOKING: In contradiction to text book literature, 71% of the patients in this study were nonsmokers. This may be because, more than 50% of the patients being female population. It was noticed that all the smokers in the study were males. It was interesting to note that 28 of the 44 males with ventral hernia were smokers, which was more than 60%.

OBESITY: In the present study, 43% patients were obese and 46% patients were overweight showing a strong correlation between obesity and ventral hernia. Also, no patient was underweight, further proving this theory.

ULTRASOUND OF ABDOMEN: In the present study ultrasound was done in all cases as routine investigation to the contents of the sac and size of the defect pre-operatively

CONTENTS OF THE SAC: In the present study, the contents of the sac were identified and recorded preoperatively by ultrasonography and were later confirmed intra-operatively. As majority of the patients in this study had reducible hernias, sometimes the sac was found empty at the time of surgery. In the present study, most common content seen was omentum (71.8%). Only 4 patients (4.4%) showed bowel loops along with omentum; whereas only 1 patient (1.04%) showed pre-peritoneal fat along with omentum. Bowels were found to be the content in 19 out of 96 patients (19.79%). Pre-peritoneal fat was seen in less than 10% (9.37%) of the patients. Only one among 15 patients with epigastric hernia had bowel loops as content. The remaining 14 patients had either omentum or pre-peritoneal fat as content. Preperitoneal fat was seen mostly in epigastric hernia.

Contents of the sac in all types of hernias were,

1. Omentum
2. Bowel loops
3. Pre-peritoneal fat

They were present alone or in combination based on the size of the defect. Bowel loops were commonly found to be the content of sac with defect size more than 3cm in the present study. When the hernial defect was less than 3cm, bowel loops were found rarely. In the present study, 29 patients (30.2%) had large hernial defect ($\geq 4-10$ cm), out of which 15 (51%) patients had bowel loops as content. As per the present study, it can be stated that omentum was found to be the most common content of small and moderate ventral hernias and pre-peritoneal fat was found to be the most common content in epigastric hernias. In the present study, in large ventral hernias, bowel loops were found to be the most common content.

SIZE OF THE ABDOMINAL WALL DEFECT: The size of the abdominal wall defect was noted pre-operatively along with the contents of the sac by ultrasonography and was later confirmed by intra-operative findings. The hernias were classified into small, medium and large based on size of the defect according to EHSCVH⁽⁷⁾. In the present study, majority of the patients in the study showed a moderate sized defect. Both the patients with recurrent incisional hernia that were included in the study had defect of moderate size (4-10cm). 28 out of 94 (29.7%) patients had defect less than 2cms; 37 out of 94 (39.3%) patients had moderate defect i.e., defect of 2cms or more, but less than 4cms in size; 29 out of 94 (30.8%) patients had large defect i.e., defect size more than or equal to 4cm. The mean size of the defect in the present study was 3.37cms. **NUMBER OF DEFECTS:** In the present study, 86 out of 96 patients (89.5*%) had a single defect; whereas 7 out of 96 patients (7.29%) had two defects and 3 out of 96 patients (3.13%) had 3 defects. Multiple defects were usually encountered in patients with either incisional hernia or epigastric hernia.

TYPE OF SURGERY: All the patients underwent open hernia repair. Most common method of ventral hernia repair done in the present study was on-lay mesh hernioplasty (94.80% cases i.e., 91 out of 96 patients). Abdominoplasty was done in combination with on-lay mesh hernioplasty in two patients with morbid obesity. Anatomical repair was carried out in 5 patients out of 96 patients (5.20%). This study shows that use of mesh for ventral hernia repair is very common in our college irrespective of the size of the defect or anatomical location of the hernia.

VI. CONCLUSION

As per the present study of 96 patients ventral hernia conducted in Narayana Medical College during December 2015 to November 2017, the following conclusions were made:

1. Incidence of ventral hernia was highest in the age group ranging from 31yrs-50yrs.
2. Incisional hernia was most common type of ventral hernia followed by umbilical, epigastric and paraumbilical hernia in that order.
3. Ventral hernia was more common in females than in males with a ratio of approximately 1 : 0.8.
4. Most of the patients with ventral hernia presented with swelling alone (94%). Some of the patients with ventral hernia presented with swelling and pain.
5. Obesity was a common risk factor for both primary as well as incisional hernia.
6. The most common content of ventral hernia sac was omentum followed by intestinal loops .
7. Hernial defect was less than 4 cm in diameter in 70% of the cases in the present study.
8. In 90% of the ventral hernias in the present study had single hernia defect.
9. In the present study, multiple hernia defects were rare and were found only in epigastric and incisional hernias
10. In the present study, the most common surgical repair technique was mesh repair (92%).

VII. REFERENCES

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