CLINICAL STUDY AND MANAGEMENT OF VENTRAL HERNIAS IN ADULTS

S. S. Karbhari¹, Umeshchandra D. G², Srikanth Marla Chintamani³

¹Professor, Department of General Surgery, Mahadevappa Rampure Medical College.

²Professor and HOD, Department of General Surgery, Mahadevappa Rampure Medical College.

³Postgraduate Student, Department of General Surgery, Mahadevappa Rampure Medical College.

ABSTRACT

BACKGROUND

Hernia is defined as abnormal protrusion of viscous through a normal or abnormal weakness in the wall of its containing cavity. Ventral hernias are the second most common type of hernias accounting for 21% to 35% of all varieties of hernias. Reported incidence of incisional hernias is 2% to 11%. It is the most common complication after laparotomy by a 2: 1 ratio over bowel obstruction and is the most common indication for reoperation by 3: 1 ratio over adhesive small bowel obstruction. This study was undertaken to study the various clinical presentation and management of ventral hernias.

MATERIALS AND METHODS

This is a prospective study. A clinical study of 50 cases of ventral hernia has been done during the period from December 2015 to September 2017, on inpatients admitted to Basaveshwar Teaching and General Hospital (BTGH) attached to Mahadevappa Rampure Medical College, Gulbarga. Data was collected according to proforma, which included detailed history, clinical examination and investigation. Data was tabulated, analysed and results interpreted.

RESULTS

Incidence of incisional hernias was more in females with male-to-female ratio of 1: 4, while epigastric and umbilical hernias were more common in males with male-to-female ratio of 3: 1 and 2: 1 respectively. Previous surgery was the single most important cause for ventral (Incisional) hernias. Other aetiological factors were multiparity, obesity, anaemia, BPH, alcoholic liver disease and COPD. Postoperative wound infection was the important cause for development of incisional hernias. Size of the defect and presence of complication are the guiding factors for choosing the type of repair. Mesh repair is the technique of choice for most of incisional hernias and for all ventral hernias with large defect. Though sublay/ underlay mesh placement is more physiological, it can be placed either inlay or onlay.

CONCLUSION

Ventral hernias are common surgical complaints. Prevention is the better treatment in the form of meticulous dissection and proper post-operative care. Presence of ventral hernia is an indication for surgery even in presence of co-morbid conditions like ascites, COPD and BPH, as these patients are more prone for complications and of course these conditions need proper addressal before hernia repair. Mesh repair has become the standard of care and laparoscopy is the approach of choice depending on the affordability of the patients and expertise of the surgeon.

KEYWORDS

Ventral Hernias, Incisional Hernias, Mesh Repair, Suture Repair.

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BACKGROUND

Billroth told his pupil Czerny: "If we could artificially produce tissues of the density and toughness of fascia and tendon, the secret of the radical cure of hernia would be discovered." Synthesis of plastic began in the twentieth century and nylon was the first material widely available as suture. Publications document the use of nylon mesh during World War II in France. Unfortunately, nylon loses tensile strength due to hydrolysis and denaturation and is associated with hernia recurrence. During the 1950s and 1960s, polypropylene and Dacron were introduced.¹

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Corresponding Author:

Dr. Srikanth Marla Chintamani,

Department of General Surgery

2nd floor, BTGH,

Kalburgi.

E-mail: srikudude@gmail.com

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Objectives

1. To study the modes of presentations, risk factors and predisposing factors and complications of ventral hernias.
2. To study various surgical options, currently available to treat ventral hernias and the changing trends.

MATERIALS AND METHODS

This is a prospective study. A clinical study of 50 cases of ventral hernia has been done during the period from December 2015 to September 2017, on inpatients admitted to Basaveshwar Teaching and General Hospital (BTGH) attached to Mahadevappa Rampure Medical College, Gulbarga. The study was approved by Ethics Committee of the hospital and informed written consent was obtained from all patients. A simple random sampling was done for selecting the patients.

The patient related factors namely age, sex, multiparity, obesity, cough/ COPD, constipation, prostatism, diabetes mellitus, hypertension, steroid therapy, consumption of tobacco and alcohol and past surgical history were recorded.

A Master Chart has been made recording relevant history and findings of personally studied 50 cases of ventral hernia. Routine investigations viz. Haematology, Urine examination, Chest x-ray, ECG, 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 illness were appropriately treated to attain near normal parameters before surgery. At the induction of anaesthesia, prophylactic dose of antibiotic (3rd generation cephalosporin) was given. Patients were assigned to undergo suture repair or mesh repair at operating surgeon's discretion.

In suture repair, continuous stitches with stitch width and interval approximately 1 cm was put using polypropylene (Prolene No. 1). In mesh repair, Prolene mesh was used with at least 4 cm of mesh overlapping the edges of the facial defect and secured with No. 1 Prolene.

Attention was given to Study various aspects of Ventral Hernias like-

1. Distribution of ventral hernias with respect to age and sex of the patient.
2. Types of hernia.
3. Period between the previous surgery and the development of incisional hernia.
4. Aetiological/ predisposing factors for the development of ventral hernias.
5. Common presentations.
6. Exact location and size of the defect.
7. Various surgical options for the management of ventral hernias.
8. Complications in the perioperative period.

Follow-up was done at 1, 6, 12 and 18 months of interval following surgery. Descriptive and inferential statistical analysis has been carried out in the present study. The results were analysed by using SPSS version 18 (IBM Corporation, SPSS Inc. and Chicago, IL, USA). Microsoft Word and Excel was used to generate graphs, tables, etc. Results on continuous measurements were presented on Mean $\pm$ SD (Min-Max) and results on categorical measurements were presented in Number (%). Chi-square test with Yate's correction and Fisher Exact test was applied to check the difference between the groups for different parameters.

RESULTS

Age (Years)	Frequency	Percentage
21-30	06	12
31-40	07	14
41-50	16	32
51-60	11	22
61-70	06	12
71-80	04	08
Total	50	100
Mean $\pm$ Sd (Range)	48.78 $\pm$ 13.67 (22-75)	

Table 1. Age Distribution

Gender	Frequency	Percentage
Female	30	60
Male	20	40
Total	50	100

Table 2. Gender Distribution

Age (Years)	Gender		Total	P value
	Female	Male		
21-30	04	02	06	0.999
31-40	04	03	07	
41-50	09	06	15	
51-60	07	05	12	
61-70	04	02	06	
71-80	02	02	04	
Total	30	20	50	
Inference	There is no statistically significant difference in distribution for the gender in different age groups			
Table 3. Age-Wise Gender Distribution				

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	Frequency	Percentage
Swelling over abdomen	34	78
Swelling over abdomen and pain	04	08
Swelling over umbilicus	11	22
Swelling over umbilicus and pain	01	02
Total	50	100

Table 4. Presenting Complaints

	Gender		Total	P value
	Female	Male		
Swelling over abdomen	23	11	34	0.659
Swelling over abdomen and pain	03	01	04	
Swelling over umbilicus	04	07	11	
Swelling over umbilicus and pain	0	01	01	
Total	30	20	50	
Inference	There is no statistically significant difference for the presenting complaints among the gender			

Table 5. Gender-Wise Presenting Complaints

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	Frequency	Percentage
Irreducible swelling	03	06
Obstruction	02	04
Uncomplicated	45	90
Total	50	100

Table 6. Associated Complication

	Gender		Total	P value
	Female	Male		
Irreducible swelling	02	01	03	0.845
Obstruction	01	01	02	
Uncomplicated	27	18	45	
Total	50	100	50	
Inference	There is no statistically significant difference for associated complications among the gender			
Table 7. Gender-Wise associated Complications				

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Type of Ventral Hernia	Frequency	Percentage
Epigastric hernia	10	20
Incisional hernia	28	56
Paraumbilical hernia	12	24
Total	50	100

Table 8. Diagnosis

Type of Ventral Hernia	Gender		Total	P value
	Female	Male		
Epigastric hernia	03	07	10	0.001
Incisional hernia	23	05	28	
Paraumbilical hernia	04	08	12	
Total	30	20	50	
Inference	There is statistically significant difference for the distribution of ventral hernia types among the gender			

Table 9. Gender-Wise distribution of Ventral Hernia Types

	Frequency	Percentage
Alcoholic liver disease (Ascites)	03	06
Anaemia	03	06
BPH	04	08
COPD	03	06
Obesity	09	18
Previous Surgery	28	56
Total	50	100

Table 10. Predisposing Factor

	Frequency	Percentage
Appendicectomy	01	3.57
Hysterectomy	08	28.57
Laparotomy	07	25
LSCS	07	28
Tubectomy	05	17.86
Total	28	100

Table 11. Types of Surgeries causing Ventral Hernia

	Frequency	Percentage
< 6 Months	04	14.28
6 Months - 1 Year	02	07.14
1- 5 Years	09	32.15
5-10 Years	04	14.28
>10 Years	09	32.15
Total	28	100

Table 12. Time Period of Onset of Ventral Hernia after Surgery

	Frequency	Percentage
< 10 cm	26	52
11-20 cm	14	28
21-30 cm	06	12
31-40 cm	02	04
> 40 cm	02	04
Total	50	100
Mean $\pm$ SD	13.40$\pm$7.86 (5-46 Days)	

Table 13. Size of Defect

	Frequency	Percentage
Anatomical repair	03	06
Mayo's repair	02	04
Mesh repair	45	90
Total	50	100

Table 14. Surgery Done

	Gender		Total	P value
	Female	Male		
Anatomical repair	0	3	3	0.058
Mayo's repair	1	1	2	
Mesh repair	29	16	15	

Total	30	20	50	
Inference	There is no statistically significant difference among the gender			

Table 15. Surgery Done

	Frequency	Percentage
Nil	47	94
Seroma	01	02
Surgical site infection	01	02
Wound dehiscence	01	02
Mesh infection	0	0
Accidental Enterotomy	0	0
Total	50	100

Table 16. Complication

	Gender		Total	P value
	Female	Male		
Nil	28	19	47	0.987
Seroma	1	0	1	
Surgical site infection	1	0	1	
Wound dehiscence	0	1	1	
Total	30	20	50	
Inference	There is no statistically significant difference among the gender			

Table 17. Complication

	Frequency	Percentage
<10 days	16	32
10-20 days	30	60
20-30 days	01	02
>30 days	03	06
Total	50	100
Mean $\pm$ SD	13.40 $\pm$ 7.86 (5 - 46 days)	

Table 18. Duration of Stay (Days)

ANNEXURES

Photographs showing Large Incisional Hernia Repair

Pictures showing a Huge Incisional Hernia Repair in a previous LSCS Operated Patient

There were no post-operative deaths. No major cardiovascular or pulmonary complications. Mean duration of hospital stay was 13 days (range 5 - 46). Longest duration of stay was seen with those who were medically not fit for surgery at the time of diagnosis and in those who developed complications. Follow-up of patients was done at interval of 1, 6, 12 and 18 months. All patients were contacted personally; however, 10 pts. were lost for follow-up, due to inaccessibility. Of all the patients followed up, none developed recurrence during the study period.

DISCUSSION

Ventral hernias are a common surgical problem. Millions of patients are affected each year, in incidence it 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. In adults, incisional hernias account for 80% or more of ventral hernias that surgeons repair. The prevalence of incisional hernias after laparotomy is 2% to 11% and increases substantially when certain risk factors for post-operative incisional hernia such as a wound infection or obesity are present.

Analysis of a population-based registry revealed that the rate of mesh placement for ventral incisional hernia repair has increased from 35% in 1987 to 66% in 1999.² Current practice for the repair of incisional hernias is the selective placement of mesh in patients based on the surgeon's preference and experience.³

Incisional hernias accounted for 56% of ventral hernias. The sex ratio distribution of incisional hernias showed that females were affected more. Ellis H et al have obtained 64.6% female population in their study of 342 patients. This female preponderance of incisional hernias could be due to relatively high frequency of employing lower midline incisions, notoriously prone for herniation in women who undergo surgery for pelvic organ pathology.

With respect to umbilical and epigastric hernias, male preponderance was seen.

Certainly, Incisional hernia is not unique to elderly patients, but wound healing is somewhat impaired in patients older than 60 yrs. of age and the incidence in comparable situation is considerably increased with tissues senescence as reported by Robert J Baker.

Majority of the patients who underwent gynaecological procedures (71.4%) namely Tubectomy- 25%, LSCS- 35% and hysterectomy- 40% developed incision hernia through lower midline incisions.

Clinical experience with polypropylene has demonstrated some complications when it is placed intraperitoneally including adhesion formation, erosion into abdominal viscera and fistula formation.⁴

Solid polytetrafluoroethylene (PTFE) was used for the first time in hernia surgery in 1959. Solid PTFE was plagued by high recurrence rates due to low tensile strength and lack of incorporation within tissue. Expanded PTFE (ePTFE) was later developed in Japan and was used mainly in the intraperitoneal position. Unlike polypropylene, ePTFE has a low incidence of visceral erosion, bowel obstruction, fistulisation and abscess formation, and due to rapid coverage with mesothelium less adhesion formation.^{5,6}

Another strategy to reduce adhesion formation and visceral erosion is the use of composite meshes, which have been shown to form fewer adhesions of weaker strength.⁷

CONCLUSION

- 50 cases of ventral hernias were studied with follow-up period of 6 to 18 months.
- Incisional hernias constituted 56% of all ventral hernias.
- Female preponderance was seen in Incisional hernias with male-to-female ratio of 1: 4, whereas in epigastric and umbilical/ paraumbilical hernias male predominance was seen with ratio of 3: 1 and 2: 1 respectively.

- Most of the ventral hernias presented in 4th to 6th decades. 90% of ventral hernias were uncomplicated at the time of presentation.
- Swelling was the most common complaint, pain was seen in 10%.
- Previous surgery was the single most important cause for ventral (Incisional) hernias. Other aetiological factors were multiparity, obesity, anaemia, BPH, alcoholic liver disease and COPD.
- Post-operative wound infection was the important cause for development of Incisional hernias.
- Rare hernias viz. spigelian, gastroschisis and omphalocele were not seen during our study period.
- Mesh repair is the technique of choice for most of Incisional hernias and for all ventral hernias with large defect.
- Mesh repair can be combined with elective bowel surgeries provided with careful preoperative preparation of the patient, meticulous dissection, complete haemostasis and proper post-operative care is given. This still needs further studies.
- Prolene hernia system was primarily developed for repair of inguinal hernias, now-a-days this novel technique is being increasingly employed for the management of epigastric and umbilical hernias also.
- Size of the defect and presence of complication are the guiding factors for choosing the type of repair.

Summary

Between the periods from December 2015 to September 2017, 50 cases of ventral hernias treated at Basaveshwar Teaching and General Hospital were studied and followed for a period of 6 to 18 months. Ventral hernias were common surgical problems second only to groin hernias. More than 50% of ventral hernias were incisional followed by epigastric, umbilical and paraumbilical hernias. Most of the incisional hernias developed within 5 years of previous surgery. Swelling, pain and complications along with aesthetic concerns are the causes for seeking surgical solution. Most of ventral hernias were uncomplicated at the time of presentation, remaining presented with obstruction necessitating emergency repair.

Incidence of incisional hernias was more in females with male-to-female ratio of 1: 4, while epigastric and umbilical hernias were more common in males with male-to-female ratio of 3: 1 and 2: 1 respectively. Previous surgery was the single most important cause for ventral (Incisional) hernias. Other aetiological factors were multiparity, obesity, anaemia, BPH, alcoholic liver disease and COPD. Postoperative wound infection was the important cause for development of incisional hernias.

Size of the defect and presence of complication are the guiding factors for choosing the type of repair. Mesh repair is the technique of choice for most of Incisional hernias and for all ventral hernias with large defect. Though sublay/ underlay mesh placement is more physiological, it can be placed either inlay or onlay.

Followup of patients was done at interval of 1, 6, 12 and 18 months. All patients were contacted personally; however, 10 patients were lost for follow-up, due to inaccessibility. Of all the patients followed up, none developed recurrence during the study period.

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