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A COMPARATIVE STUDY OF CLOSURE VERSUS NON- CLOSURE OF HERNIAL DEFECT IN LAPAROSCOPIC VENTRAL HERNIA MESH REPAIR

[1*]Dr Kotivenkateswararao Ande, [2]Dr .M.N. Pavan Kumar, [3]Dr M. Manisegaran

[1]Assistant Professor: Department of Surgical Gastroenterology: Government Medical College, Anantapur, Andhra Pradesh.

[2,3]Consultant Surgical Gastroenterologist, Department of Surgical Gastroenterology: Yashoda Hospitals Somajiguda, Matha Nagar, Hyderabad, Telangana.

***Corresponding author**

Dr Kotivenkateswararao Ande,

Assistant Professor, Department of Surgical Gastroenterology, Government Medical College, Anantapur, Andhra Pradesh.

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ABSTRACT

Introduction: Ventral hernias are widespread and difficult-to-treat surgical ailments. Surgical repair is performed for most symptomatic umbilical hernias and can be done by different techniques, such as using a mesh with and without closure.

Aims: To study Closure versus Non-closure of hernia defect in laparoscopic ventral hernia mesh repair.

Materials and methods: A prospective observational study of 96 cases of ventral hernia was studied over a period of 2 yrs. Patients aged18-80 years with Elective repair of ventral hernia of defect size1-5 cm were enrolled in study.

Results: 71 % of patients were females and 29 % of patients were males in the present study. Peak incidence is seen in the age group between 4^{th} to 5^{th} decade. Out of 96 cases of ventral hernia, 58% of cases were incisional hernia, 20% of cases were umbilical hernia, 19% of cases were para umbilical hernia, 3% of cases were epigastric hernia. Closure of the ventral hernia defect leads to more post-operative pain than non-closure group. Closure of ventral hernia defect reduces the seroma formation compared to non-closure group. Closure of ventral hernia defect maintains the abdominal contour. Postoperative ileus is more in the closure group than in non-closure group, which caused prolonged hospitalization. No significant difference in the recurrence in both groups in the follow-up period.

Conclusion: Amongst both closure and non-closure, closure is comparatively better compared to non-closure in laparoscopic ventral hernia mesh repair.

Keywords: ventral hernia, laparoscopic repair, Postoperative ileus

drvenkateshwararaokoti@gmail.com

INTRODUCTION

A ventral hernia is defined as a protrusion through the weakness or defect in the anterior abdominal wall fascia. These hernias can be categorized as spontaneous or acquired or by their location on the abdominal wall. Epigastric hernias occur from xiphoid process to umbilicus, umbilical hernias at the umbilicus and hypogastric hernias are rare spontaneous hernias that occur in midline below the umbilicus. In adults, about 80% of hernias are acquired as a result of previous surgery hence the term incisional hernias. They usually occur within 2 to 5 years after surgery and the process starts from first postoperative month.

The open approach remains the standard technique for ventral hernia repair. However, the rate of its recurrence and morbidity is high. The laparoscopic ventral hernia repair has potentially replaced open repair nowadays. Laparoscopic ventral hernia repair has been reported to have decreased recurrence rates, minimal surgical site infections, and a lesser hospital stays compared to that of open repair.

Repair of the abdominal wall defects can be quite challenging even for most experienced surgeon under best of conditions. Majority of patients with ventral hernia require repair by some method although there are no guidelines as to which hernia needs intervention. Laparoscopic Ventral hernia mesh repair (LVHMR) was first reported by Le Blanc and Booth in 1993 and since then the procedure has gained popularity with the belief that it may shorten the hospital stay, improve patient outcomes, fewer complications, early return to work and importantly reduced recurrence rates. Even in the laparoscopic method there have been many modifications about the type of mesh and method of fixation. Though technique of laparoscopic repair of ventral hernias has almost been standardized, the ideal mesh, management of the defect and fixation techniques are still areas of debate and evolving.[1,2,3]

The aim of the present study was to look at the complications like post-operative pain, seroma, ileus, recurrence of Closure vs Non-closure of hernia defect in laparoscopic ventral hernia mesh repair.

MATERIAL AND METHODS

This is a Prospective observational study conducted in the department of Surgical Gastroenterology at Yashoda Super-specialty Hospital, Somajiguda, Hyderabad for a period of 2 years duration, from April 2017 to March 2019.

All patients detected to have ventral hernia during the period of April 2017 to March 2019 were studied at Yashoda super-specialty Hospital, Somajiguda, Hyderabad. The total number of cases studied were 96 which includes all forms of ventral hernia such as umbilical, paraumbilical, epigastric, incisional and spigelian hernia.

Inclusion Criteria: Elective repair (primary or recurrent, except for previous IPOM technique), Defect size1-5 cm estimated preoperatively of Patients aged18-80 years.

Exclusion criteria: Contraindication for laparoscopic surgery, Hernia defect size less than1cm and more than 5 cm, Emergency repair, Previous IPOM, Epidural or Spinal block administered and Chronic pain syndrome (chronic back pain, chronic headache, severe dysmenorrhea, fibromyalgia's or other conditions requiring daily pain medication)

Methodology:

Seroma is one of the major complications after the laparoscopic ventral hernia mesh repair surgery. It was proved that Seroma is high in Non-closure of hernia defect treatment group (P_1 =18.75%) comparing to the Closure hernia defect treatment group (P_2 =2.04%) from the previous study[3]. Considering the $Z_{\alpha/2} = 1.96$ is critical value of normal distribution at 95% confidence interval, $Z_\beta = 0.84$ is the critical value of the Normal distribution at β with the power of 80%.

n= 48.392 ≅ 48.

∴We need 48 sample per group. Therefore, we need 96 sample for the total study.

A total of 96 patients underwent Laparoscopic ventral hernia repair at our institution were divided into 2 groups. Group A Contains 48 number of patients selected for CLOSURE, Group B contains 48 number of patients selected for NON-CLOSURE procedure. Cases were divided based on the computer randomization.

MS Excel was used to randomize the 96 patients to 2 treatment groups with 1:1 ratio. Only the patients who satisfied the Inclusion and Exclusion criteria of our study underwent randomization. Block randomization technique was used to maintain the equal sizes for all the treatment groups. Initially arranged all the treatments in any order. In the next column generated random numbers by using the "rand" function in Excel. After fixing these random numbers assigned ranks to

$$n = \frac{(Z_{\alpha/2} + Z_\beta)^2 \times (p_1(1-p_1) + p_2(1-p_2))}{(p_1 - p_2)^2}$$

$$n = \frac{(1.96 + 0.84)^2 \times (0.1875(1-0.1875) + 0.0204(1-0.0204))}{(0.1875 - 0.0204)^2}$$

all the random numbers. Finally sorted them by Rank. First patient will be assigned to 1st Rank treatment, second patient will be assigned to 2nd Rank treatment and continues the same.

All patients underwent thorough clinical examination and if patient underwent previous abdominal surgery a detailed history of earlier operation was asked. All patients were simultaneously evaluated for any systemic disease or any precipitating cause. Patients who had associated hypertension, diabetes mellitus or cough were controlled and monitored preoperatively.

Routine investigations like Hb, TC. DC, BT, CT, Urine analysis and blood grouping and cross matching were done. All cases were undergoing ECG, Blood Sugar (Fasting and Postprandial), blood urea and serum creatinine, HIV/ HbsAg /HCV investigations. Chest X-ray and USG was done in all cases. Pre-operative fitness was obtained. Some cases cardiology opinion taken, and ECHO was done as per the cardiologist advise. All 96 cases were operated on elective basis.

All cases were admitted prior to surgery to permit pre-operative investigations and preparation. A day prior to surgery, shaving of the abdomen, genitalia, perineum and back was done. Overnight patient was kept fasting. All patients were asked to take scrub bath in the morning on the day of surgery. A Ryle's tube was passed, and broad-spectrum antibiotic was given to all patients in the operation theatre. Operations were done under general anesthesia, Foleys catheterization was done for all patients, nasogastric decompression tube placed for all patients, In the operation room patients underwent thorough skin preparation over area of operation with povidone – iodine solution. Abdomen is draped. antibiotic Prophylaxis will be given to all patients. Pneumoperitoneum is created by open method- at Palmer's point in all cases. In all cases 10mm 30degree telescope is used. Two port technique is used. In the present study all adhesions will be released by combination of blunt, sharp dissection and bipolar coagulation. In Group A patient's closure is done by percutaneous approach with 1 PDS with interrupted sutures, the hernia sac is incorporated into the sutures. The stitches are placed at 0.5-1 cm from the fascial edges and with 0.5-1 cm between the stitches. In all case dual sided mesh is used of size 15 x 15 cm or 10 x 15 cm depending on the defect size. Mesh is fixed by both transfacial suture fixation and Tackers. Drains are not used. Skin sutured with absorbable suture material. Ryle's tube removed for all patients at the end of the operation before extubation. The patients receive intravenous Diclofenac or Tramadol for postoperative 24h to alleviate discomfort and pain, and if necessary, Paracetamol1000 mg IV 8- hourly. Post operatively deep breathing exercises and movement of limbs in bed are advised as soon as patient recovered from anesthesia. The antithrombotic protection is obtained with Inj. Fragmin 5000 IU subcutaneously per day. The post-operative analgesic regimen after discharge is paracetamol 650 mg QID with NSAID (aceclofenac) 100 mg BD or tramadol 50 mg BD for 5 days. Foley's catheter was removed on first post-operative day. Early limited ambulation was done once patient can bear pain. Pain during activity (mobilization from supine to sitting) on the first post-operative day, approximately hours after the hernia repair. For this purpose, patients register using a VAS questionnaire (0 = no pain, 100 = worst imaginable pain) supplemented with registrations on a VRS regarding pain levels during activity (no pain, little pain, moderate pain, severe pain during mobilization from lying to sitting position). IV fluids are continued till passage of flatus, thereafter patient received liquid diet and later soft diet. patient discharged once he /she tolerated soft diet. At discharge patients were advised to restrict their activities for first six months. A compressive dressing is maintained until the seventh post-operative day. The patients will first follow up on the 7th post- operative day for dressing. They will be subsequently followed up on every 3 months post operatively, up to 1 year. During follow-upvisits, the patients were asked for any symptoms and operative site examined for any short-term complications and U.S.G examination performed to exclude recurrence of hernia or seromas. At the time of review These cases were then analyzed and results were compared with existing literature.

Post-operative pain was assessed by Visual Analogue Scale (VAS). Pain VAS was self-completed by the patient. Patients were asked to place a line perpendicular to the VAS line, at that point represents their pain intensity score and was measured by ruler, measuring the distance (mm) on the 10cm line between the "no pain" anchor and the patient masks providing a range of score from (0-100). Based on the distribution of pain VAS scores were given as – no pain – 0-4mm, mild pain – 5-44mm, moderate pain 45-74mm, severe pain 75- 100mm.

Ileus was assessed by asking the patient passed flatus and feces and by clinical examination Seroma was diagnosed postoperatively by the clinical examination by the bulging at hernial site and confirmed by ultra sonogram. Clinical examination and USG were done for all the cases in postoperative period within the hospital at regular follow up periods.

Recurrence was diagnosed by patients' symptoms, thorough clinical examination and confirmed by radiological examination

Statistical Analysis: Data was analyzed by Microsoft Excel and Graph Pad Prism software. Data was summarized by Mean ± SD for continuous data and percentages for categorical data. The comparison between two groups was done by unpaired t test/Mann Whitney U test for continuous data and Chi-square test/Fisher's exact test for categorical data. The comparison between duration was done by repeated measures ANOVA test and followed by Bonferroni's Multiple Comparison Test for continuous data and chi-square test/Fisher's exact test for categorical data. All p-values less than 0.05 were considered as statistically significant.

RESULTS

Table 1: The comparison between non-closure and closure for the parameter age (in years)

age (in years)	Range	Mean	SD	P-value
Non- Closure	31 to 73	44.77	10.32	0.850
Closure	24 to 67	45.17	10.14	

There is no significant difference between non-closure and closure for the parameter age (in years).

Table 2: The comparison between non-closure and closure for the parameter sex

Gender	**Female**	**Male**	**P-value**
Non-Closure	35	13	0.823
Closure	33	15	
Total	68	28	

Conclusion: There is no significant difference between non-closure and closure for the parameter sex.

Table 3: The comparison between non-closure and closure for the parameter Age, USG / Size of Hernia Defect (in cm2) and hospital stay

Age (in years)	**Range**	**Mean**	**SD**	**P-value**
Non- Closure	31 to 73	44.77	10.32	0.850
Closure	24 to 67	45.17	10.14	
USG / Size of Hernia Defect (in cm2)				
Non-Closure	1.21 to 21.16	6.45	4.72	0.221
Closure	1.44 to 23.04	8.34	6.34	
Hospital Stay				
Non-Closure	1 to 4	2.04	0.77	0.822
Closure	1 to 6	2.17	1.19	

There is no significant difference between non-closure and closure for the Age, parameter USG / Size of Hernia Defect (in cm), Hospital stay

Table-4: The comparison between non-closure and closure for the parameter POD Pain

Duration	Groups	Range	Mean	SD	P-value
1 Day	Non-Closure	40 to 94	69.06	12.21	0.064
	Closure	42 to 94	73.81	12.63	
7 Day	Non-Closure	10 to 56	26.25	10.23	0.008
	Closure	8 to 56	32.63	12.66	
3 Months	Non-Closure	0 to 0	0	NA	
	Closure	0 to 0	0		
6 Months	Non-Closure	0 to 0	0	NA	
	Closure	0 to 0	0		
9 Months	Non-Closure	0 to 0	0	NA	
	Closure	0 to 0	0		
12 Months	Non-Closure	0 to 0	0	NA	
	Closure	0 to 0	0		

There is significant difference between non-closure and closure for the parameter POD pain in7 days. There is no significant difference between non-closure and closure for the parameter POD pain in1 day. Remaining 3 months, 6 months, 9 months, 12 months all are same. There is significant difference between non-closure and closure for the parameter POD Seroma in7 days. Remaining 1 day, 3 months, 6 months, 9 months, 12 months all are same. Duration 1 day, 7 days, 3 months, 6 months, 9 months, 12 months all are same. There is no significant difference between non-closure and closure for the parameter POD Seroma in 9 months and 12 months. Remaining 1 day, 7 day, 3 months, 6 months all are same.

Table-5: The comparison between non-closure and closure for the parameter type of Hernia

Groups	**Epigastric**	**Incisional**	**Paraumbilical**	**Umbilical**	**Total**	**Chi-square value**	**P- value**
Non- Closure	2	27	10	9	48	0.6796	0.878
Closure	1	29	8	10	48		
Total	3	56	18	19	96		

There is no significant difference between non-closure and closure for the parameter type of Hernia.

Table-6: The comparison between duration for the parameter POD Pain in Non-Closure group

Duration	**Minimum**	**Maximum**	**Mean**	**SD**	**P-value**
1 Day	40	94	69.06	12.21	<0.0001
7 Day	10	56	26.25	10.23	

3 Months	0	0	0	0
6 Months	0	0		0
9 Months	0	0	0	0
12 Months	0	0	0	0

There is significant difference between duration for the parameter POD Pain in non-closure group.

Table-7: The multiple comparisons between duration for the parameter POD Pain in Non-Closure group

Multiple Comparisons	Mean Difference	t-value	Significant? P < 0.05?	Summary
1 Day vs 7 Day	42.81	34.06	Yes	***
1 Day vs 3 Months	69.06	54.94	Yes	***
1 Day vs 6 Months	69.06	54.94	Yes	***
1 Day vs 9 Months	69.06	54.94	Yes	***
1 Day vs 12 Months	69.06	54.94	Yes	***
7 Day vs 3 Months	26.25	20.88	Yes	***
7 Day vs 6 Months	26.25	20.88	Yes	***
7 Day vs 9 Months	26.25	20.88	Yes	***
7 Day vs 12 Months	26.25	20.88	Yes	***
3 Months vs 6 Months	0	0	No	ns
3 Months vs 9 Months	0	0	No	ns
3 Months vs 12 Months	0	0	No	ns
6 Months vs 9 Months	0	0	No	ns
6 Months vs 12 Months	0	0	No	ns
9 Months vs 12 Months	0	0	No	ns

There is significant difference between 1 day and 7 day, 3 months, 6 months, 9 months, 12 months; 7 day and 3 months, 6 months, 9 months, 12 months; there is no significant difference between 3 months and 6 months, 9 months, 12 months; 6 months and 9 months, 12 months; 9 months and 12 months for the parameter POD Pain in non-closure group.

Table-8: The comparison between duration for the parameter POD Pain in closure group

Duration	Minimum	Maximum	Mean	SD	P-value
1 Day	42	94	73.81	12.63	<0.0001
7 Day	8	56	32.63	12.66	
3 Months	0	10	0.38	1.829	
6 Months	0	0	0	0	
9 Months	0	0	0	0	
12 Months	0	0	0	0	

Statistical test: Repeated Measures ANOVA test

Conclusion: There is significant difference between duration for the parameter POD Pain in closure group.

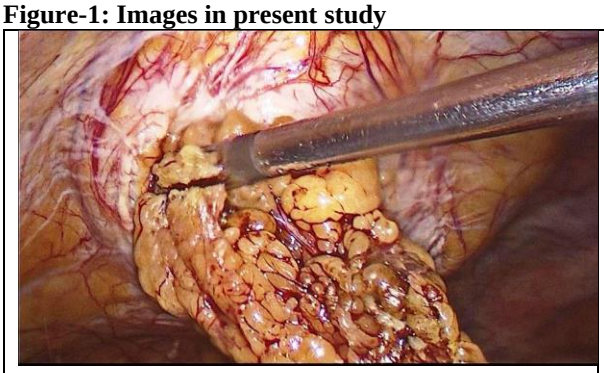
Table-9: The multiple comparisons between duration for the parameter POD Pain in closure group

Multiple Comparisons	Mean Difference	t-value	Significant? P < 0.05?	Summary
1 Day vs 7 Day	41.19	29.97	Yes	***
1 Day vs 3 Months	73.44	53.44	Yes	***
1 Day vs 6 Months	73.81	53.72	Yes	***
1 Day vs 9 Months	73.81	53.72	Yes	***
1 Day vs 12 Months	73.81	53.72	Yes	***
7 Day vs 3 Months	32.25	23.47	Yes	***
7 Day vs 6 Months	32.63	23.74	Yes	***
7 Day vs 9 Months	32.63	23.74	Yes	***
7 Day vs 12 Months	32.63	23.74	Yes	***
3 Months vs 6 Months	0.38	0.27	No	ns
3 Months vs 9 Months	0.38	0.27	No	ns

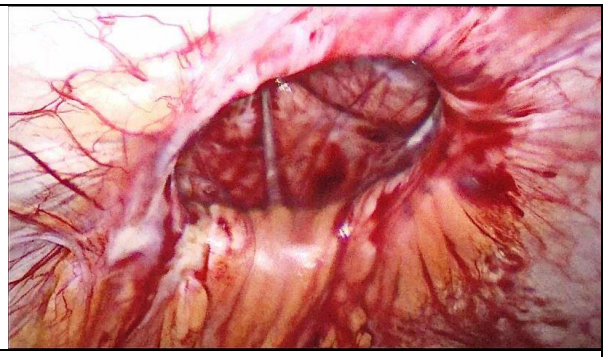
3 Months vs 12 Months	0.38	0.27	No	ns
6 Months vs 9 Months	0	0	No	ns
6 Months vs 12 Months	0	0	No	ns
9 Months vs 12 Months	0	0	No	ns

Statistical test: Bonferroni's Multiple Comparison Test
Conclusion: There is significant difference between 1 day and 7 day, 3 months, 6 months, 9 months, 12 months; 7 day and 3 months, 6 months, 9 months, 12 months, 3 months and 6 months, 9 months, 12 months; there is no significant difference between 6 months and 9 months, 12 months; 9 months and 12 months for the parameter POD Pain in closure group.
Duration for the parameter POD ileus in non-closure and closure group all are same. There is no significant difference between duration for the parameter POD recurence in Non-Closure group.

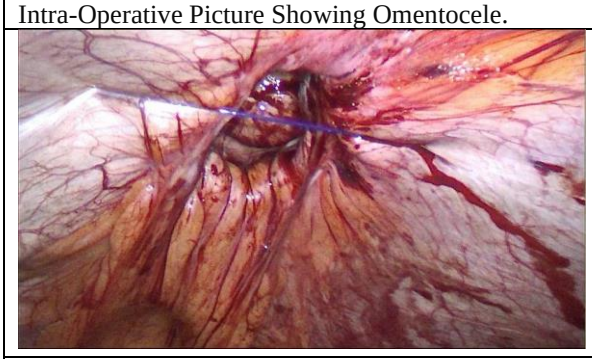
Figure-1: Images in present study



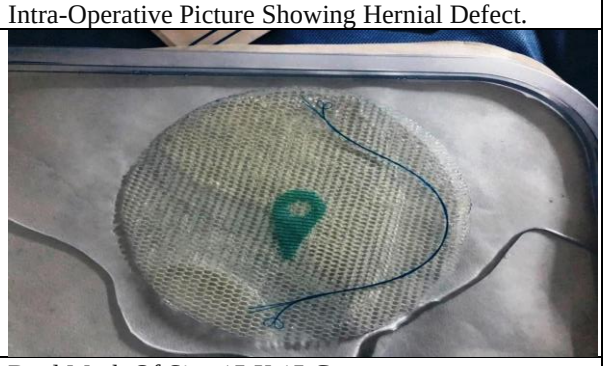
Intra-Operative Picture Showing Omentocele.



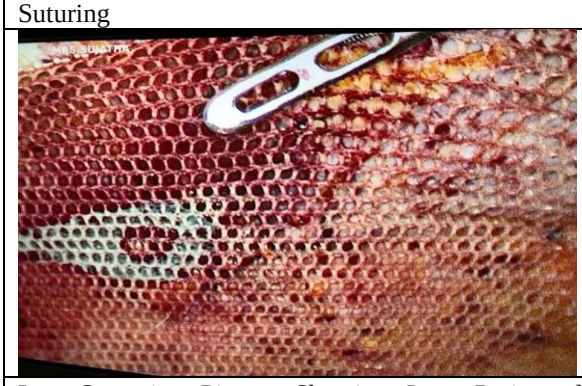
Intra-Operative Picture Showing Hernial Defect.



Intra-Operative Picture Showing Extra Corporeal Suturing



Dual Mesh Of Size 15 X 15 Cm.



Intra-Operative Picture Showing Intra Peritoneal Onlaymesh Fixation.

DISCUSSION

Ninety-six cases of ventral hernia were studied in present study. Now we have compared the present study with other studies in different parameters.
In the study conducted by Zeichen et al [4] maximum cases of ventral hernia were between the age group of 26-91 years age with the mean ± SD age was 63.08 ± 16.25 for non-closure group and 63.43±13.25 for closure group. In Gonzalez et al[5] study age range 26-89 years with the mean ± SD age for non- closure was 55±13.2 and for closure was 56.6± 14.5. In present study out of 48 in non-closure group was (31-73) years age with the mean ±

SD age was 44.77 ±10.32 and in the closure group age range of 24-67 years with the mean ±SD age of 45.17 ± 10.14 years. There is no significant difference in the age parameter between non-closure and closure.

According to the study conducted by Zeichen et al[4], Gonzalez et al[5] study there was increased incidence of ventral hernia in females. In the present study out of 96 cases males were 28 (29%) and females were 68(71%). In the non- closure group out of 48, 13 cases were male (27%) and 35 cases were females (73%). In the closure group out of 48, 15 were male(31%) and 33 were females(69%). This clearly indicates that the incidence of Ventral hernia is more common in females than in males. The higher incidence in females is probably due to laxity of abdominal walls due to multiple pregnancies and the greater number of caesarean section, sterilization and hysterectomies being performed on them. In males, the incidence of incisional hernia is rare as most of the operations are above the umbilicus and the integrity of the abdominal wall is good because of well-developed muscles and fascia.

According to Zeichen et al[4] study the mean ± SD, hospital stay (in days) for non-closure group was 1.38 ± and for the closure group was 1.23 ±. According to Gonzalez et al[5] study the mean ± SD, hospital stay (in days) for non-closure group 3.7 ± 6.6 and for the closure group 2.5 ± 4.1. In the present study the mean ± SD hospital stay (in days) for non-closure group was 2.04 ± 0.77 and for the closure group was 2.17 ± 1.19. There is no significant difference between non-closure and closure group for the parameter hospital stay (in days). 5 cases had more prolonged hospitalization in the closure group because of pain and ileus. Patients with defect size more than 4cm

According to Kesari et al[6] study out of 32 non closure cases, one case had pain whereas out of 49 closure cases 5 suffered with persistent postoperative pain. In the present study, On the first post-operative day the pain intensity (mean ± SD) in the non-closure group was 69.06 ± 12.21 and in the closure. Present study group was 73.81 ± 12.63 there is no significant difference in the pain parameter on the first post-operative day. In the follow-up period on 7^{th} post- operative day the pain intensity (mean ± SD) in the non-closure group was 26.25 ± 10.23 and in the closure group was 32.63 ± 12.66 ,there is a significant difference in the pain parameter on the 7^{th} post-operative day. And the significant difference is closure group has more pain than non-closure group.

There is no significant difference between non-closure and closure for the parameter POD pain on day 1, 3 months, 6 months, 9 months, 12 months. Closure of the defect undoubtedly deviates from the concept of tension- free surgery because of the straight approximation of the edges of fascial defect, so the incidence of postoperative pain was more in closure group than non-closure group on the 7 th POD, in follow up period of 3^{rd} month no significant difference between the pain parameter.

According to Kesari et al[6] study out of 32 non-closure cases 6 showed seroma, with an incidence of 18%, Out of 49 cases in the closure group only 1 case showed seroma with an incidence of 2%. According to zeichen et al study the incidence of seroma in non closure group was 4.3% and in the closure group was 11.4 %

In the present study on the 7^{th} post-operative day out of 48 cases in the non-closure group 8 cases (16%)developed seroma , Out of 48 cases in the closure group 1 case developed seroma (2%), .there is a significant difference between non-closure and closure for the parameter Seroma in the 7^{th} POD because Closure of the defect prior to mesh insertion leads to reduced seroma rate.

Zeichen et al[4] study showed opposite results compared to the present study Out of 96 cases, Seroma is aspirated for all 9 cases under aseptic precautions, after aspiration compression dressing done, and abdominal binder used.no seroma recurrence in the follow up period in both groups at regular intervals. Seroma was resolved within 3 months. On the first POD because of the pain intensity clinical and radiological examination not done.

In Kesari et al[6] study out of 32 non-closure cases 1 case (3%) showed prolonged ileus. In the present study there is no cases with ileus were observed in the non-closure group with an incidence of 0%. In closure group 3 out of 48 cases had ileus with incidence of 6%. Ileus was treated with treated with mobilization, antiemetics, nasogastric suction, and hydration and it resolved in the 4 th POD in all 3 cases,

Gonzalez et al[5] study Recurrences 5 (7.5%) in non-closure cases and 1 (1.5%) in closure cases. Kesar et al study showed 1 (%) recurrence case in non-closure group of 32 cases, whereas no cases ended up with closure. In the present study out of 48 cases of non-closure group 1 case(%) had recurrence in the 9^{th} month and no cases recurred in the closure group. The hernia recurred in the non closure group was from the 12mm port. there is no significant difference between non-closure and closure for the parameter recurrence.

Gonzalez et al[5] study showed Incisional hernia 102 cases, Umbilical 13 cases, Epigastric 10 cases, others 6. Most of them were incisional hernia cases. Wasim et al study showed 63 paraumbilical hernias, 32 incisional hernias, and 5 recurrent ones. In the present study out of 96 cases, the total number of incisional hernia cases were 56 with incidence of 58% out of which 27 were non closure with incidence of 56% and 29 were closure group with incidence of 60%.Total number of Epigastric hernias were 3 with 3% incidence out of which 2 cases were non closure with incidence of 4% and 1 was in closure group with incidence of 2%. Total number of Umbilical hernia cases were 19 with incidence of 20% out of which 9 were non closure with incidence of 19%,

10 were closure group with incidence of 21%. Total number of Paraumbilical hernias were 18 with incidence of 19%, Out of which 10 cases were non closure with incidence of 21% and 8 were closure group with incidence of 17%. There is no significant difference between closure and non-closure cases in our study.

The findings of this review suggest that hernia defect closure is advised for successful outcomes after repair, as supported by the literature [7]. This is because in contrast to the inguinal region, where the repair margins are fixed and without tension, the ventral wall of the abdomen is under continuous physiological pressure, with flexible margins. Failure to restore the wall of the abdomen to its usual anatomical place will increase the chances of a malfunctioning abdomen [8]. Mesh repair along with fascial closure rebuilds the natural structure by reapproximating the wall of the abdomen under physiological pressure, which might re-establish its physiology and prevent bulging. A central malfunctioning section of the wall of the abdomen behaves as a "sail in the wind" and is susceptible to protrusion [9]. Additionally, by abolishing the dead space, the rate of seroma formation and other problems related to the wound might be reduced. Furthermore, mesh repair with primary defect closure decreases the rate of hernia recurrence because the closure of the fascial defect permits broader lateral mesh overlap. The majority of mesh products for laparoscopic procedures are available in typical sizes. For instance, a fragment of mesh 15 × 20 cm in size may be preferred to allow ≥ 5 cm of mesh overlap while repairing a hernia defect 5 × 8 cm in size. Using closure, the mesh could cover 7.5 cm laterally and 6.0 cm vertically. However, it is crucial to note that not all ventral hernias are suitable for fascial closure; rather, suitability depends upon the size of the hernia defect. For tiny defects, especially those similar to Swiss cheese in morphology, closure of the fascial defect might not be appropriate until a certain size is reached (e.g. at least three centimetres wide). Closing defects more than 6- to 10 cm wide might be challenging [10,11]. Evidence suggests that surgeons have used closure to fix defects 12 cm wide [12,13]. Although there is no recognized method for assessing the compliance and elasticity of the abdominal wall, walls that are easily distensible are more responsive to primary fascial closure.

CONCLUSION

Amongst both closure and non-closure, closure is comparatively better compared to non-closure as It has reduced incidence of seroma formation. Maintains abdominal contour. However postoperative pain and ileus are more in closure group.

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