ORIGINAL ARTICLE

The prevalence of post-operative Seroma formation after Ventral Hernia Repair in patients using Abdominal Binder versus not using Abdominal-Binder

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Abstract:

Background: Ventral hernias are a commonly encountered pathology in surgical units. These are abnormal projection of abdominal viscera or part of viscera through a defect in anterior abdominal wall. Seroma formation is one of the common post operative complications. Wide spread dissection and the resultant enlarged dead space results in the collection of serous fluid formation. The objective of this study was to compare the prevalence of post-operative seroma formation in patients after ventral hernia repair with use of abdominal binder versus no abdominal binder.

Materials and Methods: This randomized controlled trail was conducted in the department of general surgery, Mercy Teaching Hospital Peshawar, Pakistan from January 2021 to December 2022.108 patients were randomly allocated by toss method into 2 groups i.e., abdominal belt binding group and non-binding group having 54 patients in each group. The data for the sample were described by counts and percentages and for the population as confidence interval with 95% confidence level. Mc Nemar chi-square test was used to assess post-operative seroma formation after ventral hernia repair in abdominal binder using versus non-using abdominal binder

Results: Seroma formation occurred in 27% (15) (15*100/54=27) patients in abdominal binder group, while in non-binder group seroma formation occurred in 75%(41) (41*100/54=75) patients and H_{01} was accepted as results were statistically not significant (p-value>0.05).

Conclusion: In our study it was found that post-operative seroma formation was reduced in patients using abdominal binders as compared to non-binders after ventral hernia repair. So, this study will help surgeons in alleviating post-operative seroma formation by using abdominal binder post-operatively.

Keywords: Seroma, ventral hernia, epigastric hernia, abdominal binder, complications.

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Introduction:

Ventral hernias are a commonly encountered pathology in surgical units.[1] These are abnormal projection of abdominal viscera or part of viscera through a defective anterior abdominal wall.[2] The prevalence of ventral hernias is increasing rapidly, mostly due to obesity and requires surgical management in elderly patients.[3]

The options for ventral hernia repair are dependent on the size of defect, patient's priority and surgeons' preference.[3] Guidelines published by the IEHS implies open hernia repair for small defects < 2cm and open mesh repair is devised for defects >10cm while the rest of hernias are considered for laparoscopic approach.[4] Laparoscopic hernia repair is considered sophisticated in patients with large hernias or having adhesions from previous abdominal operations.[5] However both techniques of surgical repair are considered secure and are widely employed for ventral hernia repair.[6-7]

Mesh support decreases the recurrence rate in ventral hernias.[8] Successful hernia repair implies no post-operative complications i.e., pain, seroma formation, wound infection, scar formation and recurrence.[9]

Seroma formation is one of the common post operative complications.[10] Wide spread dissection and the resultant enlarged dead space results in the collection of fluid and seroma formation.[11] Clinically profound seroma is found in about 3-17% of laparoscopic ventral hernia repair cases.[12-13] Seromas can persist for several months or even years and can cause post-operative infection, skin flap necrosis, delayed hospital discharge and recurrence as well.[14-16]

In case of asymptomatic seroma "wait and watch" policy is employed, however if seroma enlarges or show signs of infection then aspiration or even re-exploration becomes necessary.[17]

Zia et al.[18] from Daru Sehat Hospital Karachi, Pakistan for the period of 1 and half years from Jan 2017 to June 2019 found that seroma formation occurred in 4(8%) cases in abdominal binder group and in 12(24%) cases in non-binder group & the results were statistically significant (p-value<0.05).

Dogar et al.[19] from Central Park Teaching Hospital Lahore, Pakistan for the period of 6 months from January 2019 to June 2019 found that seroma formation occurred in 2(6.7%) patients in abdominal binder group and 8(26.7%) patients in non-binder group and the results were statistically significant (p-value<0.05).

Unawareness about the outcome after abdominal binder use and no abdominal binder on post-operative seroma formation after ventral hernia repair was our research problem. Unavailable data regarding this problem was our knowledge gap and what is the outcome after abdominal binder use and no abdominal binder on post-operative seroma formation after ventral hernia repair.

The objective of this study was to compare the prevalence of post-operative seroma formation after ventral hernia repair in abdominal binder using versus not using abdominal binder.

Research Null Hypothesis (H_{01}): H_{01} there is no statistically significant difference in seroma formation in ventral hernia repair patients post-operatively in abdominal binder using versus not using abdominal binder.

Material and Methods:

Design, setting and duration: This randomized controlled trail was conducted in the department of general surgery, Mercy Teaching Hospital Peshawar, Pakistan for a period of 2 years from Jan 2021 to December 2022. Approval was granted from Hospital ethical committee and informed consent was taken from patients or attendants.

Sampling and Randomization: All adult patients having primary or recurrent umbilical and para-umbilical hernia and planned to undergo open ventral hernia repair under general anesthesia were included in the study. Patients having chronic liver disease, Ascites, Renal Failure, Pregnant females or ventral hernia with gut perforation or strangulation were excluded from the study. 108 patients were randomly allocated by toss method into 2 groups i.e., abdominal belt binding group and non-binding group having 54 patients in each group.

Procedure, intervention and follow-up: All 108 patients under went ventral hernia repair by open ventral hernia repair technique. Preoperatively patients were given IV antibiotics injection Ceftriaxone 1gm, 1 hour before incision. All patients were given Injection Ceftriaxone 1gm IV* BD for 1 day post-operatively and then oral Antibiotic Tab Moxifloxacin 400mg* OD for 5 days. All patients were given Injection Toradol* BD for 1 day post-operatively and then Tab Voren 50mg* BD for pain relief for 5 days. Patients were discharged after 24 hours of surgery. 54 patients in Abdominal binder group were applied abdominal binder immediate post-operative period 24 hourly for 1 week then >12 hours for 6 weeks and in non-binder group no abdominal belt was applied.

Table 1: Comparison of seroma formation after ventral hernia repair in abdominal binder using versus not using of abdominal binder

Groups		Seroma Formation		Total	Chi-square value	d.f	p-value
		Yes	No				
Abdominal Binder Use	Yes	15	39	54	108	1	0.851
	No	41	13	54			
				H01 acceptedat α 0.05			

Seroma formation was measured on 7th post-operative day using trans-abdominal ultrasound in both groups.

Data collection and analysis plan: Gender (men/women) and age groups (≤40 years and ≥40 years) were our matching variables, whereas compare the outcome after abdominal binder use and no abdominal binder on post-operative seroma formation after ventral hernia repair was our research variable. The data for the sample were described by counts and percentages and for the population as confidence interval with 95% confidence level. Mc Nemar chi-square test was used to assess post-operative seroma formation after ventral hernia repair in abdominal binder using versus non-using abdominal binder. Data was analyzed by SPSS v.17 (SPSS Inc, Chicago, IL, USA).

Results:

In our study the mean age in abdominal binder group was 41.7±7.5 years, while it was 43.5±6.5 years in non-binder group. There were 29 women and 25 men in abdominal binder group, whereas 21 women and 33 men in Non-Binder group. There were 30 Para-umbilical hernia cases and 24 Epigastric hernia cases in abdominal binder group while 32 Para-umbilical hernia cases and 22 Epigastric hernia cases in Non-Binder group.

Seroma formation occurred in 27%(15) (15*100/54=27) patients in abdominal binder group, while in non-binder group seroma formation occurred in 75%(41) (41*100/54=75) patients and H01 was accepted as results were statistically not significant (p-value>0.05). (Table 1)

Discussion:

Post-operative seroma formation occurs after a number of abdominal surgeries e.g., Exploratory laparotomy, Cesarean section, Ventral hernia repairs & abdominoplasty etc. Morales-Conde et al.[20] found that the incidence of seroma formation after ventral hernia repair is 46%. Lund et al.[21] retrieved seroma formation in 22% patient post laparoscopic ventral hernia repair.

A number of methods have been devised to decrease the incidence of post-operative seroma formation. One of the methods to reduce the chances of seroma formation is sclerotherapy, which constitute filling of seroma cavity with a sclerosant that induces fibrosis and seals the dead space.[22] Other methods to prevent seroma formation are negative pressure drains, sealing agents e.g., collagen sponge having coating of human coagulation factors and pressure dressing or abdominal binder use. External pressure reduces fluid leak from vessels, so, abdominal binder can help reduce seroma formation.[11]

Abdominal binders are tightening belts that encompass the abdomen to enhance recovery process especially after exploratory laparotomy, Cesarean section, bariatric surgeries, hysterectomy or ventral hernia repair surgeries.[23] Abdominal binder usage is safe after abdominal surgeries and they minimally effect respiratory dynamics and intra-abdominal pressure.[24]

In our study it was found that seroma formation occurred in 27% patients in abdominal binder group, while in non-binder group seroma formation occurred in 75% patients. The results were not statistically significant.

Similar to our study, Zia et al.[18] from Daru Sehat Hospital Karachi, Pakistan found that seroma formation occurred in 4(8%) cases in abdominal binder group and in 12(24%) cases in non-binder group and the results were statistically significant (p-value<0.05).

Likewise Dogar et al.[19] from Central Park Teaching Hospital Lahore, Pakistan found that seroma formation occurred in 2(6.7%) patients in ab-

dominal binder group and 8(26.7%) patients in non-binder group & the results were statistically significant (p-value<0.05).

Conclusion:
In our study it was found that post-operative seroma formation was reduced in patients using abdominal binders as compared to non-binders. So, this study will help surgeons in alleviating post-operative seroma formation by using abdominal binder post-operatively. Further it will prevent complications associated with seroma formation i.e., infections, necrosis and revision surgeries.

Conflict of interest: None

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Role and contribution of authors:
Shahidullah Ahmad, conception and acquisition of data, critical revision and final approval.

Sheikh Muhammad Ibqar Azeem, conception and acquisition of data, drafting the manuscript, literature search and final approval.

Kaleemullah, conception and acquisition of data, critical revision.

Waleed Mabood, literature search and data analysis.

Sahibzada Salma Rahman, drafting the manuscript and literature search.

Usman Ullah, collected the references and also helped in material and methods writing.

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