Wound dehiscence post-midline laparotomy; effect of abdominal binder: a prospective comparative study

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Abstract:

Background: Wound dehiscence post-midline laparotomy is a problem that prolongs postoperative hospital stay and associated with mortality rates reaching 10-44%. Abdominal binders' usage post-laparotomy is a matter of habit. The evidence of their usefulness is doubtful. They were frequently used all over the world for many reasons; decreasing postoperative pain, seroma, wound dehiscence and improving pulmonary functions.

Aim of the study: We aim to assess the outcome of using an abdominal binder on wound dehiscence and its effect on postoperative pain, seroma and pulmonary functions compromisation in a follow-up period of 6 months.

Methods: This study was a prospective study, conducted at general Surgery Department in Sohag University Hospitals. The study included 60 patients (<18 years) with only midline laparotomy incision either emergency or elective during the period of the study from June 2017 to May 2018.patients were randomly allocated into two groups; first group (A) used abdominal binder and the other group (B) did not use.

Results: Patients' data (age, gender, occupation, residence, presentation, postoperative complications and follow up parameters) were collected and analyzed. It is a prospective randomized clinical trial done by sealed envelope technique. We found no difference between the two groups as regards the postoperative and follow up parameters; wound dehiscence, pain, seroma, and pulmonary function compromisation.

Conclusions: The use of abdominal binder post-midline laparotomy incision has no significant effect on reducing pain, seroma, and wound dehiscence. Also the binder can be used post-midline laparotomy incision without compromising the pulmonary function. Further clinical trials are needed.

Keywords: Binder, dehiscence, wound, laparotomy, abdominal

INTRODUCTION

Usage of abdominal binder post-laparotomy is part of the surgical history transmitted to us by various schools of surgery but has never been supported as evidence-based medicine. The majority of surgeons all over the world order it's use more frequently, a habit obtained during their surgical training.[1] An abdominal binder is often thought to be used to prevent seroma and decrease pain.[2] The major thought benefit is the prevention of abdominal wall wound dehiscence, though an improvement in postoperative comfort and pain is expected.[1]

METHODS

Study design:

This study was designed as a prospective randomized clinical trial (sealed envelope technique), and

included all patients aged from 19-65 years who have had admitted to the General Surgery Department at Sohag University Hospital to undergo an abdominal surgery through midline laparotomy incision in the period from May 2017 to June 2018 with 6 months follow up period.

The ethics committee of Sohag Faculty of Medicine approved the study and informed consent was obtained from all patients.

Patient demographics (age, gender, occupation, residence*), presentation; emergency or elective and follow up data; seroma, pain, wound dehiscence, pulmonary function compromisation and wound infection were collected and reported*. All patients were evaluated with regard to their perceived pain using Visual analog scale, as a verbal explanation of how to use the VAS scale to describe pain on a continuous scale from VAS scales was from 0 to 100. with endpoints labeled ‘‘no pain during activity’’ and ‘‘worst imaginable pain during activity’’, ‘‘no activity limitation’’ and ‘‘maximal activity limitation, ‘‘no impaired general well-being’’ and ‘‘maximal impaired general well-being’’, ‘‘no fatigue’’ and ‘‘maximal fatigue’’, and ‘‘no impaired quality of life (QoL)’’ and ‘‘maximal impaired (QoL)’’

Patients were classified into two groups:-

Group A included 30 patients who used an abdominal binder.

Group B included 30 patients who did not use the abdominal binder.

We followed up all patients in (1st, 3rd, 5th) day postoperative and with outpatient clinic visits up to the 6th month postoperative.

RESULTS

Visual analog scale (VAS) and spirometer were used in group (A) and group (B) to assess pain and pulmonary function respectively**.** *A total of 60 patients were admitted to the Department of General Surgery at Sohag University Hospital with midline laparotomy incision. Of all patients, 22 (36.7%) were less than 30 years old and 38 (63.3%) were more than 30 years old,* 19 *(*31.7*%) of all cases were females, and 41 (*68.3*%) were males.*

As regard to seroma, in group A, clinically 5 cases (16.7%) developed seroma versus 5 cases (16.7%) in group (B)**,** P-value =0.10 no significant statistically difference**.**

As regard to infection, in group A, 4 cases (13.3%) developed wound infection, versus 5 cases in group (B) P-value =0.12, no significant statistically difference.

With respect to wound dehiscence, in group A, 4 cases (13.3%) developed wound dehiscence (3) cases with gapped wound and one case with burst abdomen), versus 5 cases (16.7%) in group (B) without statistically difference p value =0.22.

As consider to pain, using the Visual analog scale in (1st,3rd,5th) day post-operative, there was no statistically difference between the two groups.

A level of P<0.05 was regarded to be significant.

1st day post – operative	Binder (n=30)	No binder (n=30)	P value
Pain activity (VAS)	50.53	69.50	0.210
Activity limitation (VAS)	52.87	65.53	0.207
Impaired general well-being (VAS)	31.53	50.47	0.342
Fatigue (VAS)	29.83	37.43	0.823
Impaired quality of life (VAS)	64.13	52.73	0.520

Table 1.showing, Mean of 1st day of VAS with binder and with no binder, and p-value.

There were no significant intergroup differences in VAS pain during activity, activity limitation, general well-being, fatigue, or quality of life on the first postoperative day (P>0.05).

3rd day post – operative	Binder (n=30)	No binder (n=30)	P value
Pain activity (VAS)	45.53	64.50	0.20
Activity limitation (VAS)	47.87	60.57	0.211
Impaired general well-being (VAS)	24.87	45.40	0.412
Fatigue (VAS)	24.83	32.43	0.721
Impaired quality of life (VAS)	59.13	47.73	0.431

Table 2. showing, Mean of 3rd day of VAS with binder and with no binder, and p-value.

There were no significant intergroup differences in VAS pain during activity, activity limitation, general well-being, fatigue, or quality of life on the 3rd postoperative day(P>0.05).

5th day post – operative	Binder (n=30)	No binder (n=30)	P value
Pain activity (VAS)	41.60	60.50	0.321
Activity limitation (VAS)	43.87	56.53	0.341
Impaired general well-being (VAS)	20.90	42.07	0.411
Fatigue (VAS)	20.83	28.43	0.761
Impaired QOL	55.13	43.73	0.567

Table 3.showing, Mean of 5th day of VAS with binder and with no binder, and p-value.

There were no significant intergroup differences in VAS pain during activity, activity limitation, general well-being, fatigue, or quality of life on the 5th postoperative day(P>0.05).

This randomized clinical trial found no effect on pain, movement limitation, fatigue, general wellbeing, or quality of life by wearing an abdominal binder.

Respecting pulmonary function compromisation there was no statistically significant difference by using spirometry daily at two stages in (1st, 3rd,5th) postoperative. The variables assessed included forced vital capacity (FVC), forced expiratory volume in the first second (FEV1), and peak expiratory flow (PEF).

	(FEV1)with binder (n=30)	(FEV1)with no binder (n=30)	P value
1st day post-operative	58.5%	51.6%	0.356
3rd day post-operative	64.6%	57.9%	0.366
5th day post-operative	73.5%	66.3%	0.405

Table 4.showing, FEV1 assessment in both groups

There were no significant intergroup differences in the FEV1 (P>0.05).

	(FVC)With binder (n=30)	(FVC)With no binder (n=30)	P value
1st day post-operative	57.13%	50.26%	0.234
3rd day post-operative	63.3%	56.5%	0. 239
5th day post-operative	72.13%	64.93%	0.218

Table 5:.showing, FVC assessment in both groups

There were no significant intergroup differences in FVC (P>0.05).

	(PEF) With binder (n=30)	(PEF) With no binder (n=30)	P value
1st day post-operative	60.8%	69.4%	0.102
3rd day post-operative	66.9%	60.2%	0.257
5th day post-operative	75.8%	68.7%	0.236

Table 6.showing, PEF assessment in both groups There were no significant intergroup differences in PEF (P>0.05).

DISCUSSION

What is the benefit from the usage of abdominal binders? To date, the previous reviews were deficient and had only suggested a possible result in terms of comfort during the early postoperative period.

Cheifetz et al, 2010 and Daniel &Matheson, 1969 studied abdominal binder effect in major abdominal surgeries and found a significant improvement in postoperative pain with no effect on pulmonary functions.[2,3]

Larson et al, 2009 found no significant effect between abdominal binders and no-abdominal binders groups as regard pain and pulmonary functions.[4] In our study, there is no significant difference between both groups in postoperative pain and pulmonary function.

Chowbey et al, 2000 found a significant reduction in postoperative seroma formation.[5] Kaafarani et al, 2009 found no detectable difference in seroma formation between both groups. Both previous studies assessed abdominal binder after laparoscopic and open ventral hernia repair.[6] In our study, there is no difference between both groups as regards postoperative seroma.

Unfortunately, no previous reviews have studied the effect of binders on wound dehiscence, which was the commonest cause for prescription in most cases by the majority of surgeons.

In our study, no detected significant difference between both groups as regard wound dehiscence.

Conclusion:

Using abdominal binder post-midline laparotomy incision for many indications has no significant impact on decreasing postoperative pain, seroma, and wound dehiscence. Also, the binder can be used post-midline laparotomy incision without compromising the pulmonary function.

Assessment of the usefulness of abdominal binder in the prevention of parietal complications post-laparotomy is deficient in the literature and needs more studies to get beneficial data and give good recommendations.

REFERENCES

1. Bouvier A, Rat P, Drissi-Chbihi F, Bonnetain F, Lacaine F, Mariette C, Ortega-Deballon P. Abdominal binders after laparotomy: review of the literature and French survey of policies. Hernia. 2014 Aug 1;18(4):501-6.
2. Cheifetz O, Lucy SD, Overend TJ, Crowe J. The effect of abdominal support on functional outcomes in patients following major abdominal surgery: a randomized controlled trial. Physiotherapy Canada. 2010 Jul;62(3):242-53.
3. Daniel WF, Matheson NA. Postoperative abdominal support. J R Coll Surg Edinb 1969;14:294-6.
4. Larson CM, Ratzer ER, Davis-Merritt D et al. The effect of abdominal binders on postoperative pulmonary function. Am Surg 2009;75:169-71.
5. Chowbey PK, Sharma A, Khullar R, Mann V, Baijal M, Vashistha A. Laparoscopic ventral hernia repair. Journal of Laparoendoscopic & Advanced Surgical Techniques. 2000 Apr;10(2):79-84.
6. Kaafarani HM, Hur K, Hirter A et al. Seroma in ventral incisional herniorrhaphy: incidence, predictors and outcome. Am J Surg 2009; 198:639-44.