

# Outcome of Prophylactic Bogota Bag Application in Midline Laparotomy Wound Closure Versus Retention En Masse Closure Using Prolene Sutures in patients with Intra-Abdominal Hypertension

MUHAMMAD NAVEED<sup>1</sup>, MAAZULHASSAN<sup>2</sup>, MUHAMMAD HASHAM ASHRAF<sup>3</sup>, RIZWAN AHMAD KHAN<sup>4</sup>, FAREEHA KHALIQ KHAN<sup>5</sup>, JAHAN ARA<sup>6</sup>

<sup>1</sup>Associate Professor Surgery, Al Aleem medical college and Gulab Devi Hospital, Lahore

<sup>2</sup>Assistant Professor, Shalamar Medical and Dental College, Lahore

<sup>3</sup>Consultant Surgeon, Ammar Medical Complex, Lahore

<sup>4</sup>Associate Professor, Shalamar Medical and Dental College, Lahore

<sup>5</sup>Associate Professor, Fatima Memorial Hospital, Lahore

<sup>6</sup>Consultant General Surgeon, DHQ Hospital, Mirpur Methelo, Ghotki

Correspondence to Dr. Muhammad Naveed, Associate Professor Surgery

## ABSTRACT

**Aim:** To compare the outcome of prophylactic bogota bag versus prolene retention sutures in patients with raised intra-abdominal pressure.

**Methodology:** All the patients fulfilling the inclusion criteria presenting to emergency with the diagnosis of trauma, peritonitis and intestinal obstruction, were admitted as per protocol in south surgical unit, Mayo Hospital Lahore. Before laparotomy, their intra-abdominal pressure was measured using intra-vesical folleys catheter. Half of the closures were done using bogota bag and half closures using the prolene retention sutures. The patients were assessed for development of intra abdominal hypertension and wound dehiscence for a period of one week after their surgery.

**Results:** Independent sample t test has applied to evaluate the difference between hospital length of stay between the patients treated with bogota bags and retention suture. The test was significant statistically i.e.  $p < 0.05$ . Chi square analysis was performed to evaluate the association between wound dehiscence and intra abdominal pressure treated with bogota bag and  $p < 0.05$ , hence the test was significant statistically.

**Conclusions:** Bogota bag application is associated with lesser complications as compared to retention suture application in intra-abdominal hypertension.

**Keywords:** Bogota bag, wound closure, midline laparotomy

## INTRODUCTION

The postoperative complications are more common after emergency laparotomies as compared to the elective laparotomies<sup>1</sup>. The commonest problems are the postoperative fever, wound infection and postoperative nausea and vomiting. Wound dehiscence, intra-abdominal abscess and abdominal compartment syndrome are local complications<sup>2</sup>.

Common indications for emergency laparotomy are secondary peritonitis, intestinal obstruction, abdominal trauma<sup>3</sup>.

In the emergency department and ICU, abdominal compartment syndrome is recognized with growing frequency as the cause of morbidity<sup>4</sup>.

The objective of the study was to compare the outcome of prophylactic bogota bag versus prolene retention sutures in patients with raised intra-abdominal pressure.

## METHODOLOGY

**Inclusion Criteria:** Patients undergoing mid line laparotomy for intestinal obstruction, peritonitis and trauma of either gender, age between 13-65 years, intra abdominal hypertension on the basis of history, clinical examination and investigations.

**Exclusion Criteria:**

- H/o respiratory, renal and cardiac diseases TB, AIDS, DM, CLD
- Previous H/o laparotomy and malignancy

All the patients fulfilling the inclusion criteria presenting to emergency with the diagnosis of trauma, peritonitis and intestinal obstruction, were admitted at Mayo Hospital Lahore. Before laparotomy, their intra-abdominal pressure was measured using intra-vesical folleys catheter. Half of the closures were done using bogota bag and half closures using the prolene retention sutures. The patients were assessed for development of intra-abdominal hypertension and wound dehiscence for a period of one week after

their surgery. Data was entered by SPSS-26. Permission for this study was granted by Institutional Ethical Committee.

## RESULTS

One hundred and six patients were included. They were divided into two groups, group 1 contained 53 patients who had received bogota bag wound closure treatment and the group 2 contained 53 patients receiving retention sutures as wound closing treatment. The mean age in group 1 was 40.2 years with 11.49 as SD and group 2 was 41.57±9.74 years.

In group 1, male patients were 60.4% (32/53) and females were 39.6% (21/53). In group 2, male patients were 60.4% (32/53) and females were 39.6% (21/53). The hospital stay of patients receiving Bogota bag wound closure treatment was 3 to 7 days i.e. 1 week, with 3.79±1.08 days as mean±SD. The hospital stay of patients receiving retention sutures wound closure treatment was 3 to 7 days i.e. 1 week, with 4.09±1.27 days as mean±SD. Among 53 patients, 8 had wound dehiscence while receiving Bogota bag wound closure treatment comprising 15.1% while no wound dehiscence was observed in 45/53 patients comprising 84.9%. Among 53 patients, 12 had wound dehiscence while receiving retention suture wound closure treatment comprising 22.6% while no wound dehiscence was observed in 41/53 patients comprising 77.4%.

The intra-abdominal hypertension was observed in 6/53 patients receiving Bogota bag wound closure treatment constituting 11.3%. While 47/53 patients did not experienced any signs of intra abdominal hypertension constituting 88.7%. The intra-abdominal hypertension was observed in 11/53 patients receiving Bogota bag wound closure treatment constituting 20.8%. While 42/53 patients did not experienced any signs of intra abdominal hypertension constituting 79.2%.

Received on 24-08-2021

Accepted on 13-01-2022

Table 1: Independent sample t test has applied to evaluate the difference between hospital stay between the patients treated with bogota bags and retention suture. The  $p < 0.05$  was significant statistically.

| Independent Samples Test |   |      |                              |       |                 |                 |                       |   |       |
|--------------------------|---|------|------------------------------|-------|-----------------|-----------------|-----------------------|---|-------|
|                          | Levene's test for equality of variances |      | t-test for equality of means |       |                 |                 |                       |   |       |
|                          | F                                       | Sig. | t                            | df    | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |       |
|                          |   |      |                              |       |                 |                 |                       | Lower                                     | Upper |
| Hospital stay            | 1.64                                    | .20  | -3.81                        | 104   | .000            | -.867           | .227                  | -1.319                                    | -.416 |
|                          |   |      | -3.81                        | 101.8 | .000            | -.867           | .227                  | -1.319                                    | -.416 |

Table 2: Chi square analysis was performed for association between wound dehiscence and intra abdominal pressure treated with bogota bag.  $P < 0.05$  was significant statistically.

| Chi-Square Tests   |                     |    |                                   |                      |                      |
|--|---------------------|----|-----------------------------------|----------------------|----------------------|
|  | Value               | DF | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square   | 38.059 <sup>a</sup> | 1  | .000                              |                      |                      |
| Continuity Correction <sup>b</sup>   | 30.954              | 1  | .000                              |                      |                      |
| Likelihood Ratio   | 28.439              | 1  | .000                              |                      |                      |
| Fisher's Exact Test  |                     |    |                                   | .000                 | .000                 |
| Linear-by-Linear Association   | 37.340              | 1  | .000                              |                      |                      |
| N =  | 53                  |    |                                   |                      |                      |
| a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is .91. |                     |    |                                   |                      |                      |
| b. Computed only for a 2x2 table   |                     |    |                                   |                      |                      |

Table 3: Chi square analysis was performed for association between wound dehiscence and intra abdominal pressure treated with retention sutures.  $P < 0.05$  was significant statistically.

| Chi-Square Tests  |                     |    |                                   |                      |                      |
|---|---------------------|----|-----------------------------------|----------------------|----------------------|
|   | Value               | DF | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square  | 47.427 <sup>a</sup> | 1  | .000                              |                      |                      |
| Continuity Correction <sup>b</sup>  | 42.017              | 1  | .000                              |                      |                      |
| Likelihood Ratio  | 47.249              | 1  | .000                              |                      |                      |
| Fisher's Exact Test   |                     |    |                                   | .000                 | .000                 |
| Linear-by-Linear Association  | 46.532              | 1  | .000                              |                      |                      |
| N =   | 53                  |    |                                   |                      |                      |
| a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 2.49. |                     |    |                                   |                      |                      |
| b. Computed only for a 2x2 table  |                     |    |                                   |                      |                      |

## DISCUSSION

In our study, independent sample t test has applied to evaluate the hospital stay between the patients treated with bogota bags and retention suture. The resulted p value was  $< 0.05$ , hence the test was significant statistically. Chi square analysis was performed to evaluate the association between wound dehiscence and intra abdominal pressure treated with bogota bag. P value was  $< 0.05$  which was significant statistically. Chi square analysis was performed to evaluate the association between wound dehiscence and intra abdominal pressure treated with retention sutures. P value was  $< 0.05$  which was significant statistically.

The closure of the abdominal wall may be required in the case of an intra-abdominal catastrophe, whether traumatic or non-traumatic, in cases when it is not possible to do so without damaging the abdominal wall<sup>5</sup>. It is possible that the approximation of the fascia's boundaries were difficult due to loss of abdominal wall, retroperitoneal oedema or collection, and omentum expansion in the case of peritonitis or retroperitoneal oedema. As a result of forced abdominal closure trials, some patients may have intra-abdominal pressure or abdominal compartment syndrome, which can culminate in physiologic derangement or even multi organ failure, necessitating abdominal decompression to break the vicious cycle<sup>6</sup>.

In cases where the abdomen was left open, either to prevent abdominal compartment syndrome or because there was insufficient tissue to approximate the defect, a Bogota bag was used for temporary abdominal closure. After the Bogota bag was attached to the fascia of the anterior abdominal wall with polypropylene interrupted sutures, the location was covered with

dry gauze to prevent infection. The patients were transferred to the ICU, where they were constantly watched for changes in their vital signs as well as the extent of the injuries they sustained.<sup>7</sup>

## CONCLUSION

Bogota bag application is associated with lesser complications as compared to retention suture application in intra-abdominal hypertension in terms of hospital stay and postoperative intra abdominal hypertension development.

**Conflict of interest:** Nil

## REFERENCES

1. Brogi E, Kazan R, Cyr S et al. Transverse abdominal plane block for postoperative analgesia: a systematic review and meta-analysis of randomized-controlled trials. *Can J Anaesth.* 2016;63(10):1184-96.
2. Lambert G, Samra NS. Stat Pearls Publishing; Treasure Island (FL): Jul 27, 2020. Anatomy, Abdomen and Pelvis, Retroperitoneum.
3. Selçuk İ, Ersak B, Tatar İ et al. Basic clinical retroperitoneal anatomy for pelvic surgeons. *Turk J Obstet Gynecol.* 2018;15(4):259-269.
4. Tesh KM, Dunn JS, Evans JH. The abdominal muscles and vertebral stability. *Spine (Phila Pa 1976).* 1987;12(5):501-8.
5. Azevedo JM, Gaspar C, Andresen C et al. Negative pressure wound therapy for skin graft closure in complex pilonidal disease. *Br J Nurs.* 2019;28(6):S24-S28.
6. Ogawa R. Surgery for scar revision and reduction: from primary closure to flap surgery. *Burns Trauma.* 2019;7:7
7. Heinemann N, Solnica A, Abdelkader R et al. Timing of staples and dressing removal after cesarean delivery (the SCARR study). *Int J Gynaecol Obstet.* 2019;144(3):283-289.