

Compare the Surgical Site Infection in Laparotomy with or without Post-Operative Drainage

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ABSTRACT

Objective: To compare the surgical site infection rate between drain placement versus without drain after emergency laparotomy.

Study Design: Randomized controlled trial

Place & Duration of Study: Department of surgery PIMS Hospital Islamabad for the duration of one year March 1, 2019 to February 29, 2020.

Materials and Methods: Total 120 patients of both genders undergoing emergency laparotomy were enrolled. Patient's detailed demographics including age, sex and body mass index were recorded after taking written consent. Patients were equally divided into two groups, Each group consist of 60 patients. Group A patients received postoperative drainage while group B didn't received postoperative drain. Deep surgical site infection was examined at 5th postoperative day. Data was analyzed by SPSS 24.0.

Results: No significant difference was observed regarding age, sex and body mass index between both groups A and B with p-value >0.05. In group A 9 (15%) patients had developed surgical site infection while in group B 12 (20%) patients had surgical sight infection. The difference between both groups was not statistically significant (p-value >0.05).

Conclusion: It is concluded that the rate of surgical site infection in patients without drain placement was high as compared to drain placement but the difference was not statistically significant.

Keywords: Surgical Site Infection, Emergency laparotomy, Postoperative Drainage

INTRODUCTION

Infections related to healthcare are a major cause of death and loss of resources to the healthcare system impacting both developing and developed nations worldwide. In the creation of countries with an over-all incidence of 11.8 per 100 surgical operations (range 1.2 to 23.6) amongst the IHS (Surgical Site Infection (SSI)). It is the second most popular form of HAI, also in developed countries such as Europe and the United States of America². In Pakistan, many SSI studies ranged from 6.5% to 13% depending on the type of injury and the surgical set-up³⁻⁵. Lawson Tait's dictum, "When in doubt, drain" is the world's standard procedure in all surgeries. Not only can anastomosis be identified early, but even post-operative adherence decrease. It helps surgeon. However, the controversy in the data, however, raises a question mark on their use, which is that it may lead to adverse operational results by causing anastomotic infections and the abdominal wound that affects anastomotic healing⁶. The incidence of SSI in patients with drain positioning was significantly higher by 31% than in patients with drainage without drain by 9 percent⁷. But in 17 percent and 18% of drain and non drain patients, Mohseni et al. observed a statistically insignificant difference in SSI⁸. There were also no major variations in the rate of infection or median duration of hospital hospital stays in an after-effect examination to assess the safety and efficacy of regular drainage⁹.

We conducted present study to compare the surgical site infection rate between drain placement versus without drain after emergency laparotomy.

MATERIALS ND METHODS

This randomized control trial was conducted at PIMS Hospital Islamabad for the duration of one year March 1, 2019 to February 29, 2020. Patient's detailed demographics including age, sex and body mass index were recorded after taking written consent. Diabetic patients, chronic renal failure patients, and those with no consent were excluded from this study.

Patients were equally divided into two groups, each group consist of 60 patients. Group A patients received postoperative drainage while group B didn't received postoperative drain. Deep surgical site infection was examined at 5th postoperative day and compares the results of both groups. Data was analyzed by SPSS 24.0. Chi square test was done to compare surgical site infection between both groups. P-value <0.05 was considered as significant.

RESULTS

In group A and B 35 (58.33%) and 38 (63.33%) patients were males while 25 (41.67%) and 22 (36.67%) were females. Mean age of group A patients was 32.54±10.48 years and in group B it was 31.46±9.74 years. In group A mean BMI was 23.28±2.46 kg/m² and in group B it was 23.76±2.32 kg/m². No significant difference was observed

regarding age, sex and BMI between group A and B (p-value >0.05). (Table 1)

Table 1: Baseline details of all the subjects

Variable	Group A	Group B	P-value
Mean age (Yrs)	32.54±10.48	31.46±9.74	0.062
BMI (kg/m)	23.28±2.46	23.76±2.32	0.14
Gender			0.074
Male	35 (58.33%)	38 (63.33%)	
Female	25 (41.67%)	22 (36.67%)	

In group A 9 (15%) patients had developed surgical site infection while in group B 12 (20%) patients had surgical site infection. The difference between both groups was not statistically significant (p-value >0.05). (Table 2)

Table 2: Comparison of surgical site infection between both groups

Variable	Group A	Group B	P-value
Surgical site infection			0.084
Found	9 (15%)	12 (20%)	
Not Found	51 (85%)	48 (80%)	

DISCUSSION

Surgical site infection is most frequently encountered complication after surgical management. Previous studies demonstrated that the prevalence of wound infection accounted 10% to 28% in patients whom were received abdominal surgeries¹⁰⁻¹¹. We conducted present study to compare the rate of surgical site infection in patients undergoing emergency laparotomy with and without postoperative drainage. In this regard 120 patients were enrolled. 60 patients received laparotomy with postoperative drainage and 60 patients received only laparotomy. Majority of patients 60.83% were males while females were 39.17%. Overall mean age of patients was 32.02±9.56 years. These results were comparable to some previous studies in which male patients population was high above 60% who received laparotomy as compared to females and average age of patients was 35 years¹²⁻¹³.

In present study overall surgical site infection was developed in 17.5% patients. These results were similar to some other studies conducted regarding prevalence of deep surgical site infection in patients received laparotomy 10 to 15%¹⁴⁻¹⁵.

In our study, we found that among patients with drain placement 9 (15%) patients had developed surgical site infection while 12 (20%) patients had surgical site infection whom didn't received postoperative drainage. The difference between both groups was not statistically significant (p-value >0.05). A study conducted by Hussain S et al¹⁶ reported that the surgical site infection rate in patients with postoperative drain was 6.3% and 8.1% in patients without drain placement. Another study conducted by Niaz CMA et al¹⁷ reported similarity to our findings in which no significant difference was observed regarding rate of surgical site infection between drain placement and with drain placement (12% Vs 13.5%) with p-value >0.05.

Gupta P et al¹⁸ reported in their study that 24% patients had developed surgical site infection in drain placement group while 50% patients had surgical site

infection in non drain placement group, a significant lower rate of surgical site infection was observed in drain placement as compared to without drain placement group with p-value >0.05.

CONCLUSION

We concluded that the rate of surgical site infection in patients without drain placement was high as compared to drain placement but the difference was not statistically significant.

REFERENCES

1. Allegranzi B, Bagheri Nejad S, Combescurre C, Graafmans W, Attar H, Donaldson L, et al. Burden of endemic health-care-associated infection in developing countries: systematic review and metaanalysis. *Lancet*. 2011;377(9761):228-41.
2. Report on the burden of endemic health care-associated infection worldwide. A systematic review of the literature. Geneva: World Health Organization; 2011.
3. Sangrasi AK . Surgical site infection rate and associated risk factors in elective general surgery at a public sector medical university in Pakistan. *International Wound Journal* 2008;5(1):74-78.
4. Khan M, Khalil J, Zarin M, Hassan TU, Ahmed N, Salman M, et al. Rate and risk factors for surgical site infection at a tertiary care facility in Peshawar, Pakistan. *J Ayub Med Coll Abbottabad*. 2011 Mar 1;23(1):15-8.
5. Malik AZ, Ali Q. Surgical Site Infections after Elective Surgery in Pakistan: SURGIPAK Study. *JRMC* 2015;19(3):209-14.
6. Arer IM, Yabanoglu H, Aytac HO, Ezer A. The effect of subcutaneous suction drains on surgical site infection in open abdominal surgery A prospective randomized study. *Ann Ital Chir*. 2016;87:49-55.
7. Mohseni S, Talving P, Kobayashi L, Kim D, Inaba K, Lam L, Chan LS, Coimbra R, Demetriades D. Closed-suction drain placement at laparotomy in isolated solid organ injury is not associated with decreased risk of deep surgical site infection. *Am Surg* 2012;78(10):1187-91.
8. Mihaljevic AL, Müller TC, Kehl V, et al. Wound edge protectors in open abdominal surgery to reduce surgical site infections: a systematic review and meta-analysis. *PLoS One*. 2015;10:e0121187.
9. Legesse Laloto T, Hiko Gameda D, Abdella SH. Incidence and predictors of surgical site infection in Ethiopia: prospective cohort. *BMC Infect Dis*. 2017;17:119.
10. Sharma L, Singh A, Bhaskaran S, Radhika AG, Radhakrishnan G. Fallopiian tube herniation: an unusual complication of surgical drain. *Obstet Gynecol* 2012;2012:194350.
11. World health organization. Global Guidelines for the Prevention of Surgical Site Infection. 2016. Available at: <http://apps.who.int/iris/bitstream/10665/250680/1/9789241549882-eng.pdf>
12. Aga E, Keinan-Boker L, Eithan A, et al. Surgical site infections after abdominal surgery: incidence and risk factors. A prospective cohort study. *Infect Dis (Lond)* 2015;47:761-7.
13. Nasir AA, Abdur-Rahman LO, Adeniran JO. Is intraabdominal drainage necessary after laparotomy for typhoid intestinal perforation? *J Pediatr Surg* 2012; 47(2): 355-8.
14. Kosins AM, Scholz T, Cetinkaya M, Evans GRD. Evidence-based value of subcutaneous surgical wound drainage: the largest systematic review and meta-analysis. *Plastic Reconstr Surg*. 2013;132(2):443-50
15. Imada S, Noura S, Ohue M. Efficacy of subcutaneous penrose drains for surgical site infections in colorectal surgery. *World J Gastro Surg*. 2013;5(4):110-4.
16. Hussain S, Iqbal MT, Ahmad Z, Dar UF. Do Postoperative Drains after Emergency Laparotomy Prevent Deep Surgical Site Infection? *PJMHS VOL. 9, NO. 2, APR – JUN 2015*.
17. Niaz CMA, Talib A, Sultan Y, Niazi AS. Emergency laparotomy; With or without drains; which option to select for prevention of deep surgical site infection. *Professional Med J* 2017;24(6):808-811. DOI: 10.17957/TPMJ/17.4075.
18. Gupta P, Kumar R. Role of subcutaneous suction drain in reducing surgical site infections after emergency laparotomy. *Int Surg J* 2017;4:2717-20.