

ORIGINAL RESEARCH

Comparative Analysis of Consequences of Laparotomy Wound in Emergency and Elective Surgery

¹Dr. Pankaj Babubhai Patel, ²Dr. Harshadray Natvarlal Parmar,
³Dr. Lomesh Ashok kumar Prajapati

^{1,2,3}Assistant Professor, Department of General Surgery, Nootan Medical College and
Research Centre, Visnagar, Gujarat, India

Corresponding author

Dr. Lomesh Ashok kumar Prajapati

Assistant Professor, Department of General Surgery, Nootan Medical College and Research
Centre, Visnagar, Gujarat, India

Email: lomeshpra22@gmail.com

Received: 16 November, 2022

Accepted: 21 December, 2022

ABSTRACT

Background: Laparotomies are frequently carried out in surgical units. After laparotomy, postoperative problems are more common, especially in emergency situations. In surgical language, “the word laparotomy explains exploration of the abdomen and proceed further according to the cause identified”. The effects of the disease are directly impacted by postoperative complications. **Materials and methods:** This study included all patients who underwent laparotomy, whether it was elective or necessary. Patients' demographic information was recorded in Performa, all complications were compared based on the type of laparotomy, and patients were monitored for 30 days after surgery. Between emergency and elective surgery, postoperative wound problems and numerous factors impacting them are compared. **Results and Conclusion:** The study found that the incidence of postoperative tissue and wound issues was higher in emergency surgery (25%) than in elective surgery (14%). It primarily depends on individuals with higher ASA scores, anaemia, and higher wound classes who are more susceptible to suffer wound problems. **Keywords:** Laparotomy, Elective, Emergency, Postoperative

INTRODUCTION

The most frequent surgical operation performed by general surgeons is a laparotomy. Laparotomy is a surgical term that refers to the investigation of the abdomen and subsequent steps depending on the underlying cause. Infections in postoperative wounds can occur anywhere from 2% and 38% of the time.[1] According to data from the NNIS (National Nosocomial Infections Surveillance) system, surgical site infections are the third most common nosocomial infection among hospitalised patients. Despite how technically skilled and capable the surgeon is in handling postoperative wound complications; surgical complications continue to be a painful and challenging component of operating on a patient.[2] Despite substantial technological advancements, postoperative vigilance, and wound infections still happen. In addition to rising morbidity and death, declining productivity at work, interference in family life, stress on employers and society, and rising costs for the entire health care system. The severity of surgical wound infections varies, ranging from the smallest suture abscess to the most virulent infection, which can sometimes

cause systemic septicaemia, wound dehiscence, or even death. The most significant single cause in the emergence of an incisional hernia and a ruptured abdomen is wound infection [3]. Ancient surgeons understood that dead tissue and foreign objects needed to be removed from wounds. [4] Asepsis, antisepsis, and anti-microbials heralded a new era in wound management after Lister, Semmelweis, Ehrlich, Fleming, and Foley recognised that bacteria hindered healing, caused sepsis, and resulted in mortality.[5]

Thus, in addition to lowering post-operative morbidity in these patients, research into this aspect of laparotomy wound complications and surgical site infections with a goal of identifying the factors causing wound infections, microorganisms affecting, and its antibiotic sensitivity will also have a significant financial benefit.

MATERIAL AND METHODOLOGY

Patients having both elective and emergency laparotomies admitted to the hospital. All probable surgical candidates were looked at and assessed in accordance with the necessary standards, which will comprise microscopy, haemoglobin percent, blood sugar, blood urea, serum creatinine, urine albumin, and urine sugar. In addition to the studies required to diagnosis these situations, which call for surgical intervention, other organ system involvement investigations, nutritional status investigations, and any other biochemical investigations are also included. post-operative problems include seroma, haematoma, and wound infection, as well as the amount of time patients spent in the hospital after surgery. The Center for Disease Control and Prevention (CDC) has three categories for surgical site infections: superficial incisional, deep incisional, and organ/space infection. Following surgery, the patient will be monitored for a minimum of one month. From the gathered data, a final analysis of incidence and risk factors was studied.

INCLUSION CRITERIA

1. All laparoscopic surgery patients, whether emergency and elective
2. Greater than 18 years

EXCLUSION CRITERIA

1. People who have a parietal wall hernia
2. Infected organ spaces in patients
3. Gynaecological disorders

Patients underwent both local and systemic complication evaluations. Patients with postoperative pyrexia and serosanguinous/serous/pus discharge coming from the main wound site were included in the investigation of the wound-related complication starting on the second postoperative day. They were then monitored for complications such wound gapping and ruptured abdomen. Additionally, patients were assessed for systemic problems like pulmonary, gastrointestinal, and urinary after surgery. A respiratory tract infection was determined based on the clinical examination and testing (blood work and a chest X-ray).Gastrointestinal problems include postoperative ileus, intestinal obstruction, diarrhoea, and gastrointestinal fistula were observed during the healing process (faecal, bilious fluid discharge from main wound or drain site). In the post-operative period, septicemia was also found, and death related to it was also noted.

RESULTS

Of the 116 patients in the study, who underwent major elective or emergency laparotomies and were between the ages of 18 – 80 years, 11 out of 58 elective and 18 out of 58 emergency laparotomies had problems. In both emergency and elective surgery, the incidence of postoperative tissue and wound problems was not significantly higher ($p=0.08$).

High ASA scores in our study increased the likelihood of laparotomy wound problems. Seroma ($p=0.004$), superficial ($p=0.025$), and deep incisional SSI ($p=0.004$) were noted in emergency surgery, in contrast to elective surgery, when only deep incisional SSI shown a significant link with developing complications ($p=0.028$).

Postoperative pyrexia, seen in 12 (20%) patients, was the most prevalent complication after emergency surgery seen in total 25% of patients, wound-related complications were the second most frequent problem, occurring in 7 (12.28%) patients, then postoperative nausea and vomiting, respiratory issues, which affected 3 (6.85%) patients, faecal fistula, post-operative obstruction, toxemia, and septicemia, which affected 4 (8%) patients. One patient experienced a deep vein thrombosis.

11 (14%) of the 58 individuals who underwent elective laparotomies experienced problems. Post-operative pyrexia, which affected 10 (19%) patients, was the most frequent complication. Following this, wound infection occurred in 3 (6%) patients, nausea and vomiting in 5 (10%) cases, and pulmonary problems in 3 (6%) cases.

Table 1: Complications according to Gender distribution

Gender	Emergency						Elective					
	Seroma		Superficial SSI		Deep SSI		Seroma		Superficial SSI		Deep SSI	
	F	%	F	%	F	%	F	%	F	%	F	%
Male	4	60	5	60	5	71	2	40	4	80	3	100
Female	2	40	3	40	2	29	3	60	1	20	0	0
Total	6	100	8	100	7	100	5	100	5	100	3	100

Table 2: Complications after emergency and elective laparotomy

Complications	Emergency cases	Elective cases
Postoperative fever	12 (20%)	10 (19%)
Post-operative nausea and vomiting	7 (12.28%)	5 (10%)
Wound related infection	7 (12.28%)	3 (6%)
Respiratory complications	3 (6.85%)	3 (6%)
Toxemia and septicemia	4 (8%)	0
Faecal Fistula	1 (2%)	0
Postoperative obstruction	1 (2%)	0

DISCUSSION

An acute abdomen requiring an emergency laparotomy is a serious test of a surgeon's surgical abilities. A satisfactory outcome requires both preoperative planning and afterwards care. Regardless of the surgical standard, poor treatment in either situation can lead to unsatisfactory results.[6] Early diagnosis and prompt treatment of surgical problems are the goals of diligent postoperative care.[7]

Numerous studies indicate that postoperative patients frequently experience fever. Fever is the third most frequent consequence in this study, behind emergency and elective laparotomies. In 20% of cases following both emergency and elective laparotomies, fever was noted.[8] The most frequent cause of early postoperative fever (temperature above $38^{\circ}\text{C}/100.4^{\circ}\text{F}$ for 48 hours or more), which goes on its own, is the inflammatory stimulation of surgery. Postoperative fevers, however, might potentially be a sign of a significant side effect. Within 48 hours post surgery, pulmonary atelectasis is frequently the cause of pyrexia. A wound infection or anastomotic breakdown should be taken into consideration if it has been more than five days since surgery. Infections of the chest, urinary system, or abdomen, such

as thrombophlebitis, can cause pyrexia between 48 hours and 5 days after surgery. Deep venous thrombosis and pulmonary embolism were the usual causes, which occurred between 7 and 10 days. According to a study on critically ill surgery patients, 26% of them experienced postoperative fever.[9]

La De Sa discovered an overall wound infection rate of 38.28% in clean, contaminated cases as opposed to a wound infection rate of 10.48% in clean cases. The importance of bacterial contamination of the wound at the time of surgery was also mentioned by GariaBaldi et al. and PL Nandi. According to a study conducted at Foothill Hospital, clean cases had a 1.5% wound infection rate, while clean contaminated cases had a 7.7% wound infection rate, a 15.2% wound infection rate, and a 40.0% wound infection rate. The foothill hospital study is consistent with wound infection rates of 12.28% following emergency laparotomies and 6% after elective laparotomies.[10]

The wound categorization approach typically ignores the various intrinsic patient risk variables that exist within each wound type.[11] Patients undergoing surgical procedures may have a number of risk factors that make them more susceptible to infection by an exogenous pathogen than the wound categorization may suggest, in contrast to elective surgery, where all patients fall into the class II category.

Due to the high ASA score in this study, more potential laparotomy wound complications were reported. Seroma ($p=0.004$), superficial ($p=0.025$), and deep incisional SSI ($p=0.004$) were noted in emergency surgery, in contrast to elective surgery, when only deep incisional SSI shown a significant link with developing complications ($p=0.028$). Infection risk and sepsis prognosis are worsened by poor blood glucose control during surgery and the postoperative period. The risk is reduced by the anesthesiologist's strict blood glucose management during surgery. On the first postoperative day, moderate hyperglycemia (>200 mg/dl) at any moment quadrupled the risk of SSI following noncardiac surgery. The incidence of postoperative infection is greatly reduced by strict glucose control, regardless of whether the patient has diabetes mellitus, according to a meta-analysis of the approximately 9 currently available trials.[12]

In this study, elective surgery had a 14% prevalence of postoperative tissue and wound issues, while emergency surgery had a 25% prevalence. These numbers are greater than those seen in previous research. The majority of patients undergoing elective surgery have cancer, which is a risk factor in and of itself and may be linked to a higher rate of complications. The study's sample size is small, and wound complications—which are complicated and dependent on other elements like obesity, nutritional status, notably hypoproteinemia, and immunocompromised states like tuberculosis and HIV—are another drawback. However, this study discovered that anaemia and the ASA score are substantially linked to wound complications.[13] Additionally, according to the NNIS, complications are more likely to develop as the wound class increases.

CONCLUSION

Multifactorial complications from laparotomies depend on a variety of circumstances. This study found that postoperative tissue and wound issues were substantially more common in emergency surgery (25%) than in elective surgery (14%; $p=0.08$). Wound problems are more likely to be associated with anaemia, a more severe wound, and higher ASA scores.

REFERENCES

1. Chauhan S, Chauhan B, Sharma H. A comparative study of postoperative complications in emergency versus elective laparotomy at a tertiary care centre, *IntSurg J.* 2017; 4:2730-5.

2. Semchyshyn N, Sengelmann RD. Surgical Complications, Available at, 2005. <http://www.emedicine.com/derm/topic829.htm>
3. Deepak R, Chavan BB, Metan, SomaniRushabh, Bharat Shankar. “Prospective comparative study of complications of laparotomy wound in elective and emergency surgery”, *Journal of evolution of medical and dental sciences*. DOI:10.14260/jemds/2014/26767, 2014; 3(21):5872-5881.
4. Alician J Mangram, Teresa C Horan et al. Guidelines for prevention of surgical site infection. 1999; 20(4):247-270.
5. Khandra Hitesh P, Vyas Pratik H, Patel Nilesh J, Mathew Jovin G. Factors affecting post-operative laparotomy wound complications IAIM. 2015; 2(1):71-75.
6. Parmar G, Gohil A, Hathila VP. Burst abdomen- a grave postoperative complication. *Internet J Surg*. 2009;20(1).
7. Smetana GW. Preoperative pulmonary evaluation. *N Engl J Med*. 1999;340:937-44.
8. Serejo LG, da Silva-Júnior FP, Bastos JP, de Bruin GS, Mota RM, de Bruin PF. Risk factors for pulmonary complications after emergency abdominal surgery. *Respiratory Med*. 2007;101(4):808-13.
9. Edmonds MJ, Crichton TJ, Runciman WB, Pradhan M. Evidence based risk factors for postoperative deep vein thrombosis. *ANZ J Surg*. 2004;74(12):108.
10. Gan TJ. Postoperative nausea and vomiting can it be eliminated. *JAMA*. 2002;287:12336.
11. Perez Garcia A, Briones Perez B. Thromboprophylaxis in post-surgical patients: review of 1,500 cases. *Surg Surg*. 2004;72(4):28791.
12. Barie PS, Hydo LJ, Eachempati SR. Causes and consequences of fever complicating critical surgical illness. *Surg Infect*. 2004;5(2):14559.
13. Kazemi-Kjellberg F, Henzi I, Tramèr MR. Treatment of established postoperative nausea and vomiting: a quantitative systematic review. *BMC Anesthesiol*. 2001;1:2.