

## Research Article

# Use of Southampton Scoring for Wound Healing in Post-surgical Patients: Our Experience in Semi-urban Setup

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### Abstract

**Objective:** Study of use of Southampton Scoring for wound healing in post-surgical patients.

**Introduction:** Post-operative wound infection is defined as 'surgical site infection from 0-30 days after surgery, or infection to surgical site till one year in cases of implants like mesh, vascular grafts,

orthopedic implants and prosthesis'[1]. This study was planned to assess the usefulness of Southampton scoring in post-surgical wounds in semi-urban set up. Methods: This study of post-surgical wound infection was carried out from November 2019 to June 2020. The study is of 140 patients who underwent surgery. Out of 140, 112 were male and 28 were female

patients. Southampton grading system from I to V were applied to all post-surgical wounds.

**Results:** 95% patients had normal healing (grade 0 or I), 2.5% had minor complications (grade II or III), 2.5% patients had major complication (grade IV or V) recorded during hospital stay.

**Conclusion:** Southampton scoring for wound healing in post-surgical patients is useful.

**Keywords:** Southampton scoring; Surgical site infection

### Introduction

Post-operative wound infection is defined as ‘surgical site infection from 0-30 days after surgery, or infection to surgical site till one year in cases of implants like mesh, vascular grafts, orthopaedic implants and prosthesis’[1]. These infections still remain a very prominent cause of both morbidity and mortality in admitted patients inspite of the ever-growing advances in the field of infection control [2]. It is believed that the infection rate after clean surgery is an appropriate indicator of surgical performance. For this purpose, good surgical wounds were identified using Southampton Scoring system [3]. Feedback of the data involving post-surgical wound status has been identified as an important strategical factor in reducing the risk of surgical site infections [4]. Thus, we wanted to see the usefulness of Southampton scoring in post-surgical wounds in semi-urban set up.

### Material and methods

This prospective study of post-operative wound infection was carried out in Bharati Hospital in the

Department of Surgery from November 2019 to June 2020. The study population consisted of 140 patients who underwent surgery. It was decided that the patients who required mesh or vascular grafts were to be excluded from this particular study as the follow up for these required to be taken for a year. Thus the inclusion criteria considered patients who underwent surgery without any implants. All patients were investigated for pre-operative investigations like hemogram, urinary examination, blood sugar, blood urea level, serum creatinine. Conventional x-rays and other special investigations were done, depending upon the case as per the requirements. Operative intervention either emergency or elective was planned for all these patients.

The patients were distributed in four categories as

Class 1 - Clean wound

Class 2 - Clean-contaminated wound

Class 3 - Contaminated wound

Class 4 - Dirty-Infected wound

### Classification of Surgical Wounds

Classification of surgical wounds was important to anticipate complications and also to plan appropriate line of treatment [5].

Class I/Clean - This category includes an uninfected clean operative wound in which there is no inflammation. The respiratory, alimentary, genital, or uninfected urinary tract is not entered. Operative incisional wounds that follow blunt trauma are also included in this.

**Example:** Abdominal incision from primary closure of exploratory surgery for repair of splenic laceration

following blunt trauma

Class II/Clean - Contaminated this category includes an operative wound in which the respiratory, alimentary, genital, or urinary tract is entered under controlled conditions and without major contamination. Specifically, operations involving the biliary tract, appendix, vagina, and oropharynx are included in this category, provided no evidence of infection or major lacuna in sterile technique is encountered.

**Example:** Tonsillectomy

Class III/Contaminated - This class contains open, fresh, accidental wounds, as well as surgeries with major lacunas in sterile technique (e.g., open cardiac massage) or gross spillage from the gastrointestinal tract, and incisions in which acute, non-purulent inflammation is encountered. Open traumatic wounds that are more than 12-24 hours old are also included in this category.

**Example:** Hemorrhoidectomy

Class IV/Dirty-Infected - This class describes an incision created during an operation in which the viscera are perforated or when acute inflammation with pus is encountered during the operation (e.g., emergency surgery for peritonitis from gross fecal contamination), as well as delayed presentation of traumatic wounds with existing contamination and devitalized tissue.

Presence of the organism prior to the surgery, causing the infection post operatively is what this

definition suggests.

**Example:** Chronic wound debridement

### Southampton wound-grading system

This wound grading system was used to grade the severity of the post-surgical wound infection. (Bailey IS et al) [6].

Grade	Appearance
0	Normal healing
I	Normal healing with mild bruising and/or erythema
Ia	Some bruising
Ib	Considerable bruising
Ic	Mild erythema
II	Erythema and other signs of inflammation
IIa	At only one point
IIb	Around sutures
IIc	Along Wound
IId	Around wound
III	Clear/serous/bloody discharge
IIIa	At only one point ( $\leq 2$ cm)
IIIb	Along the wound ( $> 2$ cm)
IIIc	Large volume
IIId	Prolonged ( $> 3$ days)

Major complication	
IV	Pus
Iva	At one point only ( $\leq 2$ cm)
IVb	Along wound ( $>2$ cm)
V	Deep/Severe wound infection with or without tissue breakdown

## Results

In present study based on our inclusion criteria, total 140 operated patients were taken for analysis who underwent surgery (105 elective surgeries and 35 emergency surgeries). Post-operative wound infection (SSIs) was found in 14 patients out of 140 patients with an overall post-operative wound infection rate of 10%. Post-operative wound infection was found in 9 patients out of 105 elective surgery patients and in 5 out of 35 patients who underwent emergency surgery.

Post-operative wound infection was more in male

patients [11 out of 112(12.55%)] as compared to female [3 out of 28 (10.92%)]. In males, Post-operative wound infection was found to be more as compared to females probably due to high exposure of environmental conditions and associated risk factors including purposeful negligence towards healthy nutrition [7].

Significant association was observed between the nature of surgery and the grade of the surgical wound according to the Southampton System. We concluded that, with the increasing grades of the wounds, the rate of post op wound infection increased. This was

similarly found in the clean to contaminated nature of surgery and this was statistically significant with a P value <0.001 [6-8].

In our present study due to severity of the cases, longer post-operative stay in hospital was the most important factor contributing to the morbidity. It was the most in grade V (30.6 days) as compared to grade IV (24.2), III (14.2), II (10.5) and I (10). It was also noted that the average stay in hospital was found to be more in contaminated nature of surgery (21.33days) as compared to clean nature of surgery (10.5 days).

In our study due to severity of the cases, longer post-operative stay in hospital was the most important factor contributing to the morbidity. The number of and severity of complications were in sync with the grading; most in grade V and the least in grade I. Complications like fever, peritonitis and burst abdomen were encountered. There was no mortality.

## Discussion

Although surgical site Infections have not really affected the long-term outcomes with regards to mortality or even wound dehiscence, Southampton scoring system is easy and applicable to classify surgical site infections.

Suboptimal wound management was seen to be the reason for the delay in return to their work. Proper counseling of the patients for follow-up in out-patient department can improve detection of wound problems and management. Our results were comparable with certain other studies. Some institutions and surgeons had an encouraging rate of 1.4% in one of the study [9]. But in another, it sky rocketed to 11.25% [10]. In a series we found higher

rate of SSI of around 17% [11]and another noted an infection rate of 4.4% [12].

## Conclusion

A definite association was identified between the wound grading system of Southampton and the nature of surgery. We concluded that, with the increasing grades of the wounds, the rate of post op wound infection increased. This was similarly found in the clean to contaminated nature of surgery and this was statistically significant with a P value <0.001. The limitation of this study was that it was a single centric study with a sample size of 140.

Large multicentric studies will be required to establish the strength of the association between Southampton scoring system and its authenticity to determine the surgical outcome.

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## References

1. Textbook of Surgery, Sabiston edition 18 Vol 1 page 258.
2. Emori TG, Gaynes RP. An overview of nosocomial infections, including the role of the microbiology laboratory. Clinical Microbiology Reviews 6 (1993): 428-442.
3. Wilson AP, Gibbons C, Reeves BC, et al. Surgical wound infection as a performance indicator: agreement of common definitions of wound infection in 4773 patients. BMJ 329 (2004): 720.

4. Heal CF, Buettner PG, Cruickshank R, et al. Does single application of topical chloramphenicol to high risk sutured wounds reduce incidence of wound infection after minor surgery? Prospective randomised placebo controlled double blind trial. *BMJ* 338 (2009): a2812.
5. Canadian Agency for Drugs and Technologies in Health. Antibacterial sutures for wound closure after surgery: a review of clinical and cost-effectiveness and guidelines for use [Internet]. 2014. Table A4, surgical wound classification. <https://www.ncbi.nlm.nih.gov/books/NBK263230/table/T5/>. (2018).
6. Bailey IS, Karran SE, Toyn K, et al. Community surveillance of complications after hernia surgery. *British Medical Journal* 304 (1992): 469-471.
7. Mishriki SF, Law DJ, Jeffery PJ. Factors affecting the incidence of postoperative wound infection. *Journal of Hospital Infection* 16 (1990): 223-230.
8. Desa LA, Sathe MJ, Bapat RD. Factors influencing wound infection (a prospective study of 280 cases). *Journal of Postgraduate Medicine* 30 (1984): 232.
9. Rottermann M. Infection after cholecystectomy, hysterectomy and appendectomy; *Health Rep* 15 (2004): 11-23.
10. Velázquez-Mendoza JD, Alvarez-Mora M, Velázquez-Morales CA, Anaya-Prado R. Bactibilia and surgical site infection after open cholecystectomy. *Cir Cir* 78 (2010): 239-243.
11. Stone AM, Tucci VJ, Isenberg HD, et al. Wound infection: Acute versus chronic cholecystitis. *The American Journal of Surgery* 133 (1977): 285-288.
12. Klevens RM, Edwards JR, Richards Jr CL, et al. Estimating health care-associated infections and deaths in US hospitals, 2002. *Public Health Reports* 122 (2007): 160-166.



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