



## “OUTCOME OF SURGICAL SITE INFECTIONS IN ELECTIVE ABDOMINAL SURGERY WITH OR WITHOUT SUBCUTANEOUS DRAIN”

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**ABSTRACT** **BACKGROUND:** Surgical site infections are among the most common complication of in-patient admission and have a serious consequence in terms of outcome and cost. In spite of use of antiseptics, strict aseptic precautions during surgery and use of broad-spectrum antibiotics, surgical site infections occur in day-to-day practice. Wound collection and the consequent sequelae results in prolonged hospital stay, continued use of antibiotics and resultant cost. This study aims to evaluate the outcome of such infection with and without the use of drain kept subcutaneously.

**KEYWORDS :** Surgical site infections, Subcutaneous drain, Antibiotics.

### INTRODUCTION

- Surgical Site Infections (SSI) are the most common nosocomial Infections and a major cause of postoperative morbidity and resource utilization.1,2
- An infected wound can prolong hospitalization by 5 to 20 days and subsequently increase medical costs.3
- Surgical Site Infections (SSI's) are the most frequently reported nosocomial infections accounting for 14% to 16% of all nosocomial infections among hospitalized patients.4
- The recent English Nosocomial Infection National Surveillance Scheme (NINSS) reported that the overall incidence of SSI's was 4.3% of all surgical operations, of which 25% were serious deep or organ/ space infections.5
- The identification of SSI's involves interpretation of clinical and laboratory findings, and it is crucial that a surveillance programme uses definitions that are consistent and standardized; otherwise, inaccurate or uninterpretable SSI rates will be computed and reported.6
- To create an effective hospital infection programme, information about local patterns is essential. This type of data is useful for both individual hospitals and national health care planners in setting programme priorities, monitoring effects of different preventive actions and in setting goals for their infection control efforts.
- Martone W et al;7 showed SSI accounting for an average of 7.3 excess hospital days and more than 1.6 million dollars of extra hospital charges.
- A survey sponsored by the World Health Organization demonstrated a prevalence of nosocomial infections varying from 3- 21%, with wound infections accounting for 5-34% of the total.8

### AIM OF THE STUDY

To evaluate the outcome of surgical site infection in elective abdominal surgery with and without gauge piece kept as drain subcutaneously.

### MATERIAL AND METHODS

**Study design:** A prospective study.

A total of 150 patients who underwent elective abdominal surgeries for various causes were included in the study.

### Inclusion Criteria:

All patients between the age group of 15 years to 75 years who underwent elective abdominal surgeries for various causes were included in the study.

### Exclusion Criteria:

Patients with preexisting skin infections were excluded from the study.

### OBSERVATIONS AND RESULTS:

**Table No. 1: Gender Distribution**

SL NO.	Gender	N(%)	Mean ± SD	Range	Minimum	Maximum
1	Male	86(42.30)	30.49 ±15.01	60	15	75
2	Female	64(57.70)	25.82 ±13.92	60	15	75
3	Overall	150(100)	28.52 ±14.69	60	15	75

**Interpretation:** The mean age of males & females were 30.49 ±15.01 & 25.82 ± 13.92 years respectively.

**Table No. 2: Drain**

SL.NO	DRAIN	N	%
1	KEPT	75	49.70
2	NOT KEPT	75	50.30
3	OVERALL	150	100

**Interpretation:** Patients were equally divided in both the groups; 75 patients with and 75 patients without drain.

**Table No. 3: Overall Rate Of Surgical Site Infection**

SL.NO		N	%
1	INFECTED	20	13.33
2	UNINFECTED	130	86.66
3	TOTAL	150	100

**Interpretation:** 20(13.33%) cases were infected when compared to 130 (86.66%) uninfected.

**Table No. 4: Co-morbid Condition & Result**

COMORBID CONIDITION	Result		Chi Squar Value	P-value	Relative Risk
	Infected	Not infected			
PRESENT	07	13	10.278	0.00112	3.76 (1.68- 8.41)
ABSENT	13	117			

**Interpretation:** Those who had comorbid condition present along with the required surgery were 3.76 times more likely to get infected when compared to those who didn't have.

**Table No. 5: Drain & Result**

DRAIN	Result		Chi Sqaure value	P-value	Relative Risk
	Infected	Not infected			
KEPT	09	66	0.46	0.83	0.91(0.39- 2.11)
NOT KEPT	11	64			

**Interpretation:** Cases in which drains were kept had 1.3% less chances of getting infected than those without drain.

**Table No. 6: Sign Of Infection & Result**

SIGNS OF INFECTION	Result		Chi- Square value	P-value	Relative risk	P-value
	Infected	Not infected				
	19	07	103.22	<0.01	179.11 (11.15-2875.96)	0.002
PRESENT	19	07				
ABSENT	0	124				

**Interpretation:** Those who had signs of infection present were 179.11 times more likely to be infected than those who didn't have any sign of infection.

## DISCUSSION

- Surgical site infections are one of the most serious infective complications of surgery. Study consideration is to remove the blood and serous fluids from the wound by drains before fluids can get infected.
- Laparotomies carry a higher risk of wound infection and a combined rate of 15% has been reported in upper and lower gastrointestinal surgery, over three times the average risk.
- On the other hand, there have so far been few reports on the efficacy of prophylactic subcutaneous drain for the prevention of SSI following elective surgery.
- It is generally thought that the incidence of SSI is related to amount of bacterium of the wound, formation of hematoma, pool of effusion, potential subcutaneous dead space, disturbance of the local circulation, and the amount of bacterium in the surgical organ.
- A subcutaneous drain might reduce the amount of bacterium around the wound and remove residual effusion and blood from the wound that could serve as a medium for bacterial growth.
- Numerous risk factors for developing SSI have been identified. Current smokers are at a 30% increased risk of SSI after major surgical procedures and smoking cessation reduces SSI. Body Mass Index and obesity have also been linked to increased risk of SSI with studies showing wound complication rates in some procedures rising from 7% up to 23% due to obesity.
- More specifically, depth of subcutaneous fat has been shown to be a strong risk factor for SSI and has been shown to be a useful predictor for SSI risk.
- Many other factors including nutrition and diabetes control, certain comorbidities, ASA class, and operation time have been identified as important factors affecting SSI.
- Various interventions have been proposed with a view to reducing SSIs. A number of them are used in routine practice. Hand washing, minimizing shaving, skin preparation, and preoperative antibiotics have all gained acceptance in the surgical community.
- Use of drains after surgery however has declined in recent times. It has been shown that drains provide no advantage after inguinal hernia repairs, and various other types of surgery.
- Use of drains, however, is still popular after abdominoperineal excision of rectum and repair of incisional hernias due to inconclusive evidence and surgeon preference.
- They are still used in some major plastic surgery procedures as they are thought to reduce collections in closed spaces.
- It has been postulated that the presence of hematoma, serous fluid, and dead space in surgical incisional wounds increases the risk of infection as this acts as a culture medium.
- Subcutaneous drains have been used to reduce the risk of infection. However, the use of postoperative subcutaneous wound drainage is not universally accepted. In addition, drains may not be efficacious and cause discomfort and increased hospital stay on their own.
- In a transitional economy like India, even a small reduction in SSI by introduction of a simple cost-effective subcutaneous drain will go a long way in reducing the economic burden of SSI on healthcare. These drains are cheap, simple to insert, don't require any special skills or technique, are not known to cause any harm to the patient and easy to remove. Though their effectiveness in preventing SSI is still a matter of debate, their use may be propagated at least in emergency setting where degree of contamination is high. However, more studies are required to study the role of subcutaneous drains in elective abdominal surgeries.

## CONCLUSION

- The study was done with aim of reducing the surgical site infections and thereby reducing morbidity, cost, duration of hospital stay and psychological stress the patient experience.
- Many novel techniques are implemented in decreasing the

incidence of surgical site infection like preparing the patient for surgery, administration of antibiotics prophylactically, when necessary, the use of subcutaneous drain before closing the skin incision followed by post operative administration of broad-spectrum antibiotics, maintenance of adequate nutrition and removal of drain after 48 hours, regular dressing and follow up.

- The drain placed subcutaneously act as a channel to drain out secretion that are likely to collect in the subcutaneous tissue following closure of the incision in the immediate post-operative period.
- There by reducing the chance of hematoma formation, seroma formation that might get infected in due course of time to cause wound dehiscence increasing the morbidity, duration of hospital stay, cost.
- In this study patient with drain has 6.0% infection and without drain had 7.3% infection. Thus, by keeping the drain in the subcutaneous tissue we facilitate the drainage of subcutaneous collection, early detection of infection and faster management of surgical site infection there by reducing the cost, hospital stay morbidity.

## Summary

- Patients were equally divided in both the groups 75 patients with drain and 75 patients without drain.
- Very few had signs of infection
- (13.36%) cases were infected when compared to 130 (86.66%) uninfected cases.
- Most commonly isolated organism was E.coli. In patients with drain and without drain.
- Patients with drain had 6.0% infection, those without drain had 7.3% infection.
- Patients who underwent surgery with co-morbid conditions along with required surgery had 3.76 times more chances of infection than patients who didn't had co-morbid conditions.
- Patients with drain had 1.3% less infection than patient without drain.
- Patients with signs of infection had 179.11 times infection rate than those who didn't had any signs of infection.

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