

Prospective Randomised Study Comparing the Patients with Midline Incision Closed with Subcutaneous Drain and without a Drain

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Abstract: **Background:** Infection of a wound can be defined as the invasion of organisms through tissues following a breakdown of local and systemic host defenses, leading to cellulitis, lymphangitis, abscess and bacteraemia. Surgical site infection (SSI) has always been a major complication of surgery and trauma and has been documented for 4000-5000 years. Patients requiring Emergency laparotomy procedure has increased risk of surgical site infection and delayed wound healing. Wound dehiscence is difficult to manage as re closure frequently leads to respiratory compromise and hypoxia. If left open, there is increased risk of nosocomial infection in the wound. There are number of methods have been used to reduce these complications from time to time. **Objective:** To study the benefit of subcutaneous drain in midline laparotomy wound healing. **Material and Method:** The study was conducted in the General surgery department of Sarojini naidu Medical College & hospital, Agra after obtaining Institutional Ethics Committee approval. **Study Period:** October 2020 – October 2022. **Source of Data:** All patients undergoing emergency laparotomy procedure at Sarojini Naidu Medical College, Agra. **Sample Size:** 100 patients, 50 in each group. Sample size group 1 = 50. Sample size group 2 = 50. Total sample size = 100. Actual power = 0.8046047. **Study Design:** A randomized control study. **Study Population:** All patients undergoing emergency laparotomy procedure, who fulfilled the inclusion criteria were selected for the study. The procedure was explained to them in detail and written consent was obtained. **Inclusion Criteria:** Patient undergoing emergency laparotomy with midline incision. Patient aged between 20-59 years of both sex patient with BMI >31 females and males. **Exclusion Criteria:** Patients age <20 and >60 years. Patients who are previously operated. Patient refusal. Patients who are immunocompromised. Patients with Diabetes mellitus, Patients with jaundice, Patients with anaemic Hb <10 gms, Patients on steroid intake, radio therapy, Patients with hepatic and renal insufficiency. Pregnant and lactating mother. **Procedure:** A prospective comparative study in which patients were randomized before surgery into two groups by systemic random sampling. Group A 50 patients with subcutaneous suction drain, Group B 50 patients without drain. Patients received in emergency department. Diagnosis made clinically and confirmed by various diagnostic modalities. Vital parameters are checked. Initial resuscitation done with crystalloids and blood products whenever necessary. Study procedure was explained to patient and patient relatives, informed written consent. was taken. Study group was randomly allocated. In operation theatre, surgical site was cleaned with povidine iodine and alcohol. Sterile draping done. Abdomen opened by midline incision using scalpel. After surgical procedure, thorough peritoneal wash given. Rectus sheath closed by non absorbable suture material. A suction drain was positioned with its tip lying over the subcutaneous layer and brought out through healthy skin by separate stab incision away from the wound and connected to a closed suction drain. **Methodology:** 1) Quantity of drainage from mini vac 8f drain was noted after every 24hrs. 2) Sterile dressing done every day. 3) If collection present on the surgical site, it will be evaluated for culture/sensitivity. Sensitive antibiotics were started. 4) Amount of drainage was recorded daily. 5) Drain was removed when the output is less than 5ml (24hr) 6) Sutures were removed (alternate on 8th&10th day) before discharge from hospital. Patients discharged only after the removal of drain.

Keywords: sub cutaneous drain, wound dehiscence, SSI, hospital stay

1. Frequency Table

Table 1: Subcutaneous Drain

| Subcutaneous Drain | Frequency | Percent |
|--------------------|-----------|---------|
| No | 50 | 50.0 |
| Yes | 50 | 50.0 |
| Total | 100 | 100.0 |

This table shows equal distribution of cases had subcutaneous drain placement. Patients with subcutaneous drain 50% and without drain 50%.

Table 2: Frequency of Wound Complication

| Wound Complication | Frequency | Percent |
|--------------------|-----------|---------|
| No | 72 | 72.0 |
| Yes | 28 | 28.0 |
| Total | 100 | 100.0 |

Among 100 patients, Wound complication was encountered in 28% of patients and remaining 72% had wound healing without complications.

Table 3: Intervention

| Intervention | Frequency | Percent |
|--------------|-----------|---------|
| No | 72 | 72.0 |
| Yes | 28 | 28.0 |
| Total | 100 | 100.0 |

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Intervention done for all wound infected patients 28% required intervention for wound healing.

Table 4: Shows SSI among Laparotomy Patients

| SSI | Frequency | Percent |
|-------|-----------|---------|
| No | 80 | 80.0 |
| Yes | 20 | 20.0 |
| Total | 100 | 100.0 |

This table shows 20% of patients had surgical site infection

Table 5: This table shows 17% patients had pain

| Pain | Frequency | Percent |
|-------|-----------|---------|
| No | 83 | 83.0 |
| Yes | 17 | 17.0 |
| Total | 100 | 100.0 |

Table 6

| | | Subcutaneous Drain | | Total | |
|--------------------|----------|--------------------|---------|---------|--------|
| | | No | Yes | | |
| Wound Complication | No | count | 29 | 43 | 72 |
| | | % within | 58.00% | 86.00% | 72.00% |
| | Yes | Count | 21 | 7 | 28 |
| | | % within | 42.00% | 14.00% | 28.00% |
| Total | Count | 50 | 50 | 100 | |
| | % within | 100.00% | 100.00% | 100.00% | |

Pearson Chi-Square=9.722**p=0.002

Wound complication without subcutaneous drain is 42% and with drain is 14%. This is statistically significant (P<0.05) using chi – square test.

Table 7

| | | Subcutaneous Drain | | Total | |
|-------|----------|--------------------|--------|--------|-------|
| | | No | Yes | | |
| SSI | No | Count | 36 | 44 | 80 |
| | | % within | 72.0% | 88.0% | 80.0% |
| | Yes | Count | 14 | 6 | 20 |
| | | % within | 28.0% | 12.0% | 20.0% |
| Total | Count | 50 | 50 | 100 | |
| | % within | 100.0% | 100.0% | 100.0% | |

Pearson Chi-Square=4.00*p=0.046

This shows association of SSI in patients with subcutaneous drain. Among patients with subcutaneous drain 12% had SSI and 28% had SSI in the group without subcutaneous drain. Statistically significant as P<0.05

Table 8

| | | Subcutaneous Drain | | Total | |
|-------|----------|--------------------|--------|--------|-------|
| | | No | Yes | | |
| PAIN | No | Count | 36 | 47 | 83 |
| | | % within | 72.0% | 94.0% | 83.0% |
| | Yes | Count | 14 | 3 | 17 |
| | | % within | 28.0% | 6.0% | 17.0% |
| Total | Count | 50 | 50 | 100 | |
| | % within | 100.0% | 100.0% | 100.0% | |

Pearson Chi-Square=8.575**p=0.003

Post operative pain is significantly lower in the group with subcutaneous drain compared to group without subcutaneous drain

(P<0.05).

Table 9

| Group Statistics | | | | | | | | |
|------------------|--------------------|----|---------|----------------|-----------------|---------|---------|--|
| | Subcutaneous Drain | N | Mean | Std. Deviation | Std. Error Mean | t value | p value | |
| Age | No | 50 | 42.3800 | 9.12697 | 1.29075 | 0.402 | 0.688 | |
| | Yes | 50 | 41.6400 | 9.26208 | 1.30986 | | | |

Table 10

| Group Statistics | | | | | | | | |
|---------------------------|--------------------|----|--------|----------------|-----------------|---------|---------|--|
| | Subcutaneous Drain | N | Mean | Std. Deviation | Std. Error Mean | t value | p value | |
| Duration of Hospital Stay | No | 50 | 9.1200 | 2.51234 | .35530 | 3.464** | p<0.001 | |
| | Yes | 50 | 7.7000 | 1.44632 | .20454 | | | |

Mean duration of hospital stay of the patients with subcutaneous drain was 7.70 ± 1.44 days and mean duration of hospital stay of patients without subcutaneous drain was 9.12 ± 2.51 days. There is significant decrease in the length of hospital stay < 0.001 .

2. Conclusion

In emergency laparotomy procedures, Subcutaneous single closed suction drain reduces postoperative surgical site infection, seroma, postoperative pain and the duration of hospital stay significantly compared to patients in whom negative suction drain was not placed.

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