

# A comparative study on wound outcome after non approximation against approximation of subcutaneous layer during emergency caesarean section in patients with abdominal subcutaneous layer > 2 cm

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## ABSTRACT

**Objective:** The objective of this study is to compare the outcome of caesarean section post-op wound in patients after either approximation or after non-approximation of the subcutaneous fat layer. **Methodology:** 390 women who underwent emergency caesarean section having abdominal fat thickness of more than 2 cm were randomly allocated in two groups of 195 each. The subcutaneous fat layer was approximated in the patients of group A. The condition of wound in each patient was examined on 5<sup>th</sup> postoperative day and the complications, if any were categorised into wound disruption, seroma, hematoma or infection. Then further postoperative analgesic, antibiotic doses and hospital stay duration were compared among two group patients. **Result:** Among 195 patients of Group A, only 20 (10.26%) had wound complications whereas in Group B, 55 patients had wound complications (28.21 %). In group A patients, only 2.5 % needed secondary suturing whereas in group B patients, 18.9 % needed secondary suturing. **Conclusion:** Approximation of the subcutaneous tissues separately significantly reduces wound complications, requirement of secondary suturing along with a significant reduction in the duration of hospital stay.

**Keywords:** Subcutaneous fat layer, wound complications, secondary suturing.

Obesity is a medical condition in which excess body fat gets accumulated to the extent that it may have a negative effect on health<sup>1</sup>. Indeed, by 2014, more than a third of all adults in the United States were obese<sup>2</sup> with similarly increasing trends seen in the entire world. As Asian populations have a tendency to develop negative health consequences at a lower BMI than Caucasians, some nations have redefined obesity. Once considered a problem of only high-income countries, obesity rates are

rising worldwide and affecting both the developed and developing world. These increases have been felt most dramatically in urban settings. The caesarean delivery rates are significantly greater in obese women. In one study, the primary rate was 33.8 percent for obese and 47.4 percent for morbidly obese women. These values compare strikingly with the rate of only 20.7 percent for normal weight ladies<sup>3</sup>. In an analysis of 226,958 women, caesarean delivery rates rose significantly for overweight

**Received:** 15<sup>th</sup> September 2019. **Accepted:** 1<sup>st</sup> December 2019.

Saumya, Das A, Sarkar S , Ghosh C, Shrivastava A. A comparative study on wound outcome after non approximation against approximation of subcutaneous layer during emergency caesarean section in patients with abdominal subcutaneous layer > 2 cm. The New Indian Journal of OBGYN. 2020; 6(2): 75-8.

(34 percent), class I ( 38 percent), class II ( 43 percent), and class III (50 percent) obesity <sup>4</sup>. A large number of women undergo caesarean section throughout the world. These women pass through a period of postoperative pain and a morbidity period. Use of the appropriate technique to approximate the wound after caesarean section would not only avoid financial load but also help in early recovery of the patient <sup>5</sup>. The best way of closing the mother's skin layer after caesarean section has been a topic of debate. Improvements in health from optimizing caesarean section techniques are likely to be more significant in developing countries because the rates of postoperative morbidity in these countries tend to be higher. Given the very high number of caesarean sections performed, even small proportional improvement may be important for the cost of health services or for the population's health <sup>6</sup>.

**Materials and Methods**

Our study was a clinical observational prospective study and was done among the patients undergoing emergency caesarean section from the period between 1<sup>st</sup> January 2017 to 31<sup>st</sup> June 2018 in department of obstetrics and gynaecology, RG Kar Medical College and Hospital, Kolkata. In a study by Nauman et al <sup>7</sup>, the incidence of wound disruption in the group where subcutaneous closure was done was 14.5% whereas it was 26.6% where subcutaneous closure was not done. Keeping an alpha error of 0.05 and 80% power of study, sample size calculated was 382. Considering a protocol violation of 2%, a total sample size gets to 382+8 = 390 with 195 in each group. However the following inclusion and exclusion criteria are used to select the final pool of patients in this study group.

Inclusion criteria –

1. Patients having abdominal subcutaneous fat layer more than 2 cm.
2. Skin incised by lower transverse incision.
3. BMI > 25 Kg/m<sup>2</sup>

Exclusion criteria –

1. Patients with anaemia, immunocompromised state, cardiac, renal and hepatic illness

2. Patients falling under category of post CS and repeat CS.

3. Patients having abdominal skin infections

We divided our study population into 2 groups, group A and group B, each having 195 patients. Group A – Subcutaneous fat layer of patients of this group was approximated by running 1-0 vicryl followed by cutaneous mattress suturing by 2-0 Ethilon. Group B – Only cutaneous layer was sutured by mattress suture with 2-0 Ethilon. Patients from both groups were given similar antibiotics and analgesics in postoperative period. On 5<sup>th</sup> postoperative day, sutures were cut and wound evaluated. Wounds were examined for any complications which were further classified under four types - wound discharge or seroma, hematoma, wound infection or wound disruption. The data was collected and correlated. For categorical data, Chi – square test or Fischer's exact T test were used. For quantitative data unpaired T test was used. The level of significance was taken at p value < 0.05.

**Results**

A total of 390 patients meeting the inclusion criteria were included in the study. In our study there was no statistically significant difference in demographic data

**Table 1: Demographic variables of patients demographic variable**

Demographic variables	Group A	Group B	P - Value
Age in years	24 ± 2.44	24.99 ± 2.30	0.8352
Distribution of gravid	Primi 124	120	0.6756
	Multi 71	75	
Residence	Urban 140	135	0.5782
	Rural 55	60	
BMI distribution	27.28±1.28	27.20±1.40	0.5563
Fat thickness in cm	2.69±0.25	2.7±0.27	0.7045
OT duration in mins	58.67±6.7	58.26±9.51	0.614

between the two groups with relation to age, residence, parity, gestational age, operative details, BMI and

**Table 2: Distribution of wound complications**

Wound complications	Group A	Group B
Wound discharge or seroma	12(60%)	28(50.90%)
Hematoma	3(15%)	11(20%)
Infection	3(15%)	7(12.72%)
Dehiscence	2(10%)	9(16.36%)
Total	20	55

indication of CS with p – value being insignificant (Table 1). The result of our study was mainly the wound outcome among the patients of both group A and group B. Among 195 patients of Group A, only 20 (10.26%) had

wound complications whereas in Group B, 55 patients had wound complications (28.21 %). Then p value calculated

**Table 3: Wound management**

Group	Secondary suturing	Daily dressing
A	5	15
B	37	18

and it is 0.001 which is significant. As we compare the percentages of different wound complications, we find that seroma was the most common complication in both groups A and B (Table 2). The management done for

**Table 4: Postoperative variables in patients**

Postoperative variables	Group A	Group B
Analgesic doses (Mean)	10.26±1.45	10.85±1.81
Antibiotic doses (Mean)	10.45±2.06	11.82±3.44
Hospital stay (Days)	5.59±1.61	6.85±2.97

wound complication was done either by secondary suturing or daily dressing (Table 3). If we compare the mean by Chi square test in both groups, p value is 0.0011 which is significant. We calculated the mean requirement of antibiotic and analgesics by both groups and SD ratio (Table 4). We compared the two results by unpaired t test and found the p value 0.001 in both, which is significant.

### Discussion

All over the world, there is an increasing trend of obesity. The rate of caesarean section is increasing day by day to prevent maternal and foetal morbidity due to maternal obesity. Obese patients are already susceptible for more postoperative morbidity. Demographic data such as age, parity, gestational age, operative details, BMI, fat thickness and indications for Caesarean section show no statistically significant difference between our two groups. Wound outcome was observed on 5<sup>th</sup> postoperative day for all patients and accordingly we determined the results. Those with healthy wounds were discharged on 5<sup>th</sup> postoperative day while those having wounds with complications were further managed with analgesics, antibiotics, wound dressing and secondary suturing, depending upon wound status. Those who could not heal by dressing alone were managed by secondary suturing. Infected wounds with discharge showing growth of microbes on culture were further managed by higher grade antibiotics, dressing and secondary suturing if needed. Secondary suturing was done in clean noninfected wounds.

Naumann et al studied that there was a significant difference in the incidence of wound disruption: 14.5% in

the subcutaneous closure group compared with 26.6% when the subcutaneous tissues were not re approximated (RR 0.5, 95%, CI = 0.3-0.9). Hence they concluded that closure of the subcutaneous tissue can significantly reduce the rate of postoperative wound disruption in women with at least 2 cm of subcutaneous adipose tissue<sup>7</sup>.

The result of our study was mainly determined by the wound outcome among the patients of both group A and group B. Among 195 patients of Group A, only 20 (10.26%) had wound complications and rest 175 (89.74%) had healthy wound. In Group B patients, whereas 55 had wound complications (28.21 %) and rest 140 (71.79%) had no wound complications. Then p value calculated from chi square test was found to be 0.001 which is significant. Among patients of group A, 15 of them were managed by dressing alone and 5 of them needed secondary suturing. In group B patients, 37 were managed by dressing alone while 18 needed secondary suturing. When we compared the mean of two groups by chi square test, we found p value to be significant and It is 0.0011.

Analgesics needed in postoperative period was mostly in 5 to 10 doses in number in group A (89.7%) and B (72.3%). Among group B, 23.6% patients needed 10 – 15 doses whereas in group A, only 7.7 % took 10-15 analgesic doses. 15-20 doses of analgesic was taken by 4.1 % of patients in group B and about 2.6% in group A. When we calculated the difference of mean of the two groups by unpaired t test, we found p value is of 0.001 which is significant.

Antibiotics were used among group A patients with 90% being given 5-10 doses, while rest 5 % took 10-15 doses and other 5 % took 15-20 doses. While in group B, 72% of patients were given 5-10 doses, 8 % took 10-15 doses, 19 % of patients took 15-20 doses while 1% took 20-25 doses. We compared the mean and SD ratio of two groups by unpaired t test and found the p value of 0.001, which is significant. 80.5% patients in group A and 66.2% patients in group B, had 5 days of hospital stay. In group A, 16.9 % patients and in group B, 16.4% patients stayed for 5-10 days. While in decreasing trend, only 2.6 % of patients of group A stayed till 10-15 days while 17.4 % of group B had a stay of 10-15 days. When we compared the mean duration of hospital stay for 2 groups, we found it to be significant with p value of 0.001.

The limitations of our study are as stated below –

This is a single tertiary hospital based study. Hence cannot be applied to the whole population. No follow up was done after discharge and hence any recent wound complication after discharge could not be taken into account.

### Conclusion

Wound complications are significantly reduced in group A (where subcutaneous tissue was approximated) that is 10.26 %, whereas in group B, 28.21% patients had wound complications. In group A patients, only 2.5 % needed secondary suturing whereas in group B patients 18.9 % needed secondary suturing. The results of our study show that when comparing both groups, group A patients have better wound outcome than group B patients. Overall our study shows that wound healing is better in groups where subcutaneous tissue was separately approximated. Also, wound complications are much less in this group. Finally, the hospital stay is also reduced. As such, we can conclude that approximation of subcutaneous tissues separately significantly reduces wound complications, requirement of secondary suture and also reduces the duration of hospital stay, thereby reducing antibiotics and analgesics doses.

**Conflict of interest:** None. **Disclaimer:** Nil.

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