

## ROLE OF SUBCUTANEOUS TISSUE CLOSURE IN RELATION TO WOUND DISRUPTION AFTER CESAREAN SECTION IN OBESE PATIENTS

SHAILESH KORE ● SEETHILAXMI R. ● RAIJUL MAYEKAR ● V.R. AMBIYE

### SUMMARY

A prospective study was conducted of 200 obese patients undergoing cesarean section at L.T.M.G. Hospital, Sion, Mumbai 400 022. The aim of the study was to evaluate a role of subcutaneous tissue closure in relation to wound disruption after cesarean in these obese patients. 100 patients of subcutaneous tissue closure group were compared with 100 patients of non-closure group. The wound disruption occurred in 11 patients of non-closure group as compared to only 4 in closure group.

### INTRODUCTION

Disruption of the abdominal incision is a major source of morbidity after cesarean section. Infection, hematoma or seroma formation can disrupt skin closure or necessitate opening the incision for drainage. Infection is the most common cause of wound disruption. The incidence of post-

cesarean wound infection, through changes with population studied ranges between 2.5% to 29.7% (Del Valle et al, 1992). It is important to identify risk factors and treatment modalities that can decrease the incidence of these complications.

Obesity has been identified as strong independent risk factor for wound complications. The vascular supply to the subcutaneous fat is relatively poor, making this tissue susceptible to infection after contamination with pathogens. Serous fluid

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Dept. of Obs & Gyn, L.T.M.G. Hospital & College,  
Mumbai.

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collection and hematoma collection even increase the risk of infection. Although closure of subcutaneous fat may decrease serous fluid collection, additional suture material may increase the risk of wound infection. The purpose of this study was to determine whether the closure of subcutaneous tissue in obese women decreases the rate of wound disruption without increasing the rate of wound infection.

#### MATERIALS AND METHODS

A prospective study comparing closure with nonclosure of the subcutaneous tissue after cesarean section was done at L.T.M.G. Hospital, Sion, Mumbai 400 022 over a period of two years. A total of 200 cases were included in the study, 100 in each group. All patients with atleast 2.5 cms. (1 inch) of subcutaneous fat, found at the time of surgery, were eligible for the study. The cases were distributed randomly so as to keep number of patients comparable in two groups as related to indication of cesarean section, type of incision, medical complication, socio-economic status, pre-operative and intraoperative high risk factors.

Before surgery, abdominal and pubic hair were removed by disposable razor.

All patients received full abdominal skin preparation with iodine soap, ether and spirit.

After facia closure, the subcutaneous tissue thickness was measured with sterile metallic ruler in middle of the incision, from skin surface to the fascia. The depth of subcutaneous fat was measured at a cephalic end of the wound in case of Pfannensteiel incision. The wound was irrigated with sterile saline. In closure group, subcutaneous tissue was sutured with continuous running suture using 2-0 polyglycolic acid (dexon). The skin was sutured by black silk with vertical mattress sutures. The incision was dressed with sterile bandage that was removed on the fifth post-operative day and the new dressing was done. The sutures were removed on seventh post-operative day in patients without any complications. All patients received post-operative antibiotics (cephalosporins + metronidazole) for 7 days.

All operations were done or assisted by the Chief author himself.

#### OBSERVATIONS AND RESULTS

Majority of our patients were between 20-30 years of age. Table I summarises

Table I  
COMPARISON OF CLOSURE AND NON-CLOSURE GROUPS

	Closure n = 100	No closure n = 100
Age (years)	23.6±5.5	25.6±3.4
Weight (kg.)	65 ± 9.2	63.4 ± 8.6
Fat thickness (cms.)	3.6 ± 1.6	3.5 ± 1.4
Perioperative infection	12%	8%
Previous scar	23%	19%
Diabetes	3%	3%
Length of surgery (mins.)	54 ± 15	53 ± 12



demographic information for two groups. Average dept of subcutaneous fat was 3.5 while average weight was 64.2 in these patients. Diabetes, previous scar and peri-operative infection are known to hamper tissue healing. There were total of 5 patients of diabetes mellitus taking insulin therapy in this study.

A majority of these patients were from lower-middle class.

The indications for cesarean section are listed in the Table II. In 59 patients of closure group and 62 patients of non-closure group, midline vertical incision was used while Pfannenstiel incision was taken in remaining patients.

Table III compares post-operative condition and results in these two groups. Post-operative fever - temperature more than 38°C after first 24 hours lasting for

**Table II**  
**INDICATIONS OF CESAREAN SECTION**

Indication	Closure n = 100	No closure n = 100
Cephalopelvic disproportion	17	14
Foetal distress	23	25
Previous LSCS	20	18
Nonprogress of labour	19	23
Malpresentaion	8	10
APH	6	7
Others	7	3

**Table III**  
**POST-OPERATIVE RESULTS**

	Closure	No closure
1. Fever	12	13
2. Hematoma	3	7
3. Seroma	2	7
4. Infection	4	7
5. Wound disruption	4	11
Superficial	3	6
Deep	1	5
6. Dehiscence	-	1

atleast 24 hours - incidence was 12.5%.

An infection of wound, as diagnosed by purulent discharge with classical signs of erythema, induration and tenderness was found in 4 cases of closure group as compared to 7 cases in non-closure group. A wound draining sero-sanguineous fluid and not meeting criteria for infection was classified as having seroma. It was found in total 9 cases, 2 in closure and 7 in non-closure group.

All patients with infection were treated with higher antibiotics with/without drainage of pus by opening the wound.

The disruption of wound was observed in 15 cases. The superficial disruption of wound meant less than 1 cm. deep disruption and were mainly managed conservatively, while more than 1 cm thick gaping was of deep type and required secondary suturing. In one patient in closure group and five in non-closure group, there was a complete gaping of wound comprising full length and full thickness till rectus sheath. It included also one case of wound dehiscence in non-closure group. The incidence of overall complications was higher in patients with diabetes, previous scar or perioperative infection.

#### **DISCUSSION AND CONCLUSION**

Wound complications after cesarean delivery are a major cause of morbidity and increased length of hospital stay. These complications can occur despite strict adherence to good surgical technique. Although, careful handling of tissue to minimise trauma, minimal use of cautery, observance of aseptic technique, adequate skin preparation and the use of prophylactic antibiotics are important in preventing wound

complications. The additions of subcutaneous suture can further reduce wound disruption in women with at least 2.5 cms. of subcutaneous fat.

The most important impact of subcutaneous closure appears to result from a reduction in the incidence of seroma formation. When an abdominal incision is closed by reapproximating only the fascia and skin, a potential space is left in the subcutaneous tissue. This dead space can serve as an reservoir for the collection of serous fluid or blood, increasing the possibility of seroma or hematoma. These pockets of fluid can easily get infected during surgery because the uterus is often contaminated with vaginal flora. Also, mechanical stress on the skin incision is increased when the subcutaneous tissues are not closed making disruption of the wound-incision more likely. Del valle et al (1992) published a randomized study comparing closure of subcutaneous tissue with no closure during cesarean delivery and demonstrated a reduction of post-operative wound disruption from dead space obliteration.

Although subcutaneous closure prevents seroma and reduces the tension on skin incision, these sutures can cause necrosis and invite infection. Elek and Conen (1957) reported that the presence of suture material can decrease the inoculum of bacteria needed to cause infection by factor 10,000. But most of the studies have not consistently shown any significant increase in infection rate in closure group. The type of suture material and technique of closure is important in this respect. Synthetic absorbable suture (daxon) was chosen because it has been demonstrated to be less inflammatory in



humans than gut suture (Haxton et al, 1974). A horizontal running suture was used to distribute the tension evenly throughout the length and to lessen the possibility of tissue necrosis.

This study demonstrates, that closure of the subcutaneous tissue after cesarean delivery of woman with at least 2.5 cms. of subcutaneous fat significantly decreases the incidence of seroma formation and lowers the overall rate of complications leading to disruption of the incision. The results also shows that closure does not increase

the rate of infection, even when there is a clinical evidence of intrauterine infection.

Thus, closure of subcutaneous tissue is desirable and should be done following cesarean delivery in obese patients who are at high risk for wound complication.

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SUMMARY

In present study carried out at Government Medical College and Hospital, Nagpur, on 488 patients each of cesarean section and vaginal deliveries. The incidence of postnatal seroma and infection was compared in patients with and without subcutaneous tissue closure. The results showed that closure of subcutaneous tissue significantly decreases the incidence of seroma formation and lowers the overall rate of complications leading to disruption of the incision. The results also shows that closure does not increase the rate of infection, even when there is a clinical evidence of intrauterine infection. Thus, closure of subcutaneous tissue is desirable and should be done following cesarean delivery in obese patients who are at high risk for wound complication.

KEYWORDS: Cesarean section, subcutaneous tissue closure, seroma formation, wound infection, postnatal complications.