

Subcutaneous Drain Versus Subcutaneous Suture Reapproximation: A Randomised comparative Study In Obese Patients Undergoing Cesarean Section

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Abstract

Background: Cesarean section is one of the most common operative procedures performed in modern obstetrics and at the same time cesarean section performed for obese women is rising now a days. Studies have proved that the thickness of subcutaneous tissue is a significant risk for tissue infection. So finding an optimal technique to prevent complication of cesarean delivery is the demand of this era. Use of subcutaneous drain and obliteration of dead space by subcutaneous stitch are the two time tested methods being used to prevent complications but controversies remain over these two. **Subjects and Methods:** We conducted a prospective randomized comparative study on 120 obese patients to evaluate subcutaneous stitch closure versus placement of a subcutaneous drain in women with subcutaneous depth of at least 2.5 cm. The study population was divided into two groups based on simple randomization and compared for the complications. A written informed consent was taken and selection was done on the basis of inclusion and exclusion criteria. **Results:** Both the groups were comparable with regard to demographics variables. Post –operative complications as SSI, Superficial tissue breakdown and fever shows no difference in both the groups but pain and wound seroma shows higher presence in subcutaneous stitch closure group. **Conclusion:** Abdominal incision disruption after cesarean section is a major source of morbidity, this is not only responsible for physical discomfort but it causes mental agony as well. We found placing a subcutaneous drain is little more effective way of preventing wound complications of cesarean section abdominal incision in obese female whose subcutaneous layer thickness is 2.5cms or more.

Keywords: Cesarean section, Obese, Subcutaneous Tissue Thickness, Subcutaneous Drain, Subcutaneous Stitch.

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Received: May 2018

Accepted: June 2018

Introduction

Cesarean section is one of the most common operative procedure performed in modern obstetrics (Mackeen et al;2012).At the same time, cesarean section performed for obese women is increasing now-a-days(Wahabi et al.). Finding out optimal surgical technique to prevent complications of cesarean delivery is the demand of this era where the rate of cesarean delivery and obesity are on the rise (Martin et al.). While talking about complications of cesarean section, Post operative pain,seroma and hematoma formation along with wound dehiscence is becoming more prevalent (Owen et al.,).

Soper et al 1995; in their studies confirmed that the thickness of subcutaneous tissue was a significant risk factor for tissue infection.

In 1984, Neuber and kurter recommended complete obliteration of dead space by buried suture as a means of minimizing the accumulation of blood in the wound. Beside the use of subcutaneous stay sutures in obese patients

(Sherman et al.), the selective use of subcutaneous drain has also been reported to be associated with low infections rate in bariatric surgical series (Buck Walter et al.)

We all agree that the technique of closure should be quick, easy, and economical, based on evidence and should restore the physical integrity and function of the injured tissue. Controversy remain over the use of drain in the subcutaneous space but few of us argue that prophylactic drainage may eliminate “dead space” and may reduce fluid accumulation which act as a great media for growth of bacteria. The idea of subcutaneous fat closure is, to reduce serous fluid accumulation.But; additional sutures may itself act as inoculums and increase the risk of infection.

Aims and Objectives

This study was done with an idea to detect whether subcutaneous tissue approximation or subcutaneous drain; which is more useful to prevent wound complications which may lead to seroma, hematoma or infection in obese patients with BMI more than 30 kg/m² and subcutaneous

fat thickness 2.5 cm or more.

Subjects and Methods

A prospective randomized comparative study was done on 120 obese patients between the time period of Jan 2015 to Dec 2017; admitted in the Department of obstetrics and gynaecology, TMMC and RC.

Obesity is defined as woman’s body mass index (BMI); calculated as weight in kilograms divided by squared height in meters; if found more than 30kg/m2.

All patients with at least 2.5 cms of subcutaneous fat were included in this study. A written informed consent was taken.

Randomization was maintained with a sealed envelope. In which study group was mentioned and issued to operating surgeon prior to procedure if patient was fulfilling the criteria of study.

Inclusion Criteria

- All elective and emergency cesarean section with BMI > 30kgs/m2.
- Patients with history of previous cesarean section or any surgery with BMI > 30kgs/m2.
- Only those patients whose blood report status were cleared with exclusion criteria.*

*In so many emergency cases all blood reports were not available.

Exclusion Criteria

- Consent not available
- BMI cannot be calculated
- Anemia<10 gm%
- Diabetes mellitus
- Immunocompromised
- Koch’s disease
- Deranged Lever function or renal function.

These 120 patients were divided into two equal groups.

Group-A: Abdominal incision closure with subcutaneous fat approximation.

Group-B: Abdominal incision closure with subcutaneous drain left.

All the cesarean sections were performed by MD/ MS (obstetrics and gynaecology).Type of abdominal incision was pfannenstiel and all uterine incision was on lower segment. Uterine incision was closed with number 1 delayed absorbable polyglactin (vicryl).The visceral and parietal peritoneum was not closed in any of the selected patient. The rectus sheath was closed with number 1delayed absorbable polyglactin(vicryl).Now following the closure of the rectus sheath the subcutaneous fat was measured with a sterile calibrated scale in the middle of incision and if it was found 2.5 cms or more then;

In group A, subcutaneous space was approximated with interrupted vicryl sutures (no2).

In groupB, a plane nasogastric tube no6 was placed in

subcutaneous space after manual fenestration (4-5) and was excised from the skin about 2 cms lateral to one of the angle

of wound. This drain was stitched to the skin and a 10 cc syringe was used to create suction effect and left for 48 hrs. Skin closure was done with help of non absorbable polypropylene (prolene) in mattress fashion. All the patients received I.V antibiotics for 3 days according to hospital policy and stitch removal was done on post-op day seven.

The parameters on which outcome were measured were

1. Post operative pain (according to VAS)
2. Wound seroma.
3. Post operative fever (38•c or more after 24 hrs postoperatively)
4. Superficial wound breakdown.
5. SSI

Results

Table 1:

Variables	Group A	Group B	P value
Age(Years)	26.8 + 5.2	27.2 + 5.1(Mean+ SD)	Non-Significant*
BMI(kg/m2)	31.2 + 1.6	31.1 + 1.8(Mean+ SD)	Non-Significant*
Parity	2-3	2-3 median(Rage)	Non-Significant**
Gestational age(weeks)	39.6 + 1.2	39.2 + 1.8(Mean+SD)	Non-Significant*

*Analysis using independent student’s t-test

**Analysis using Chi-square(X2) test

[Table 1] We compared the demographic data’s and found that they are comparable with mean age 26.8+5.2 in group A [subcutaneous stitch] and 27.2+5.1 in group B [subcutaneous drain]. These two groups were comparable by BMI also, as in group A mean BMI was found 31.2+1.6 and in group-B it was found 31.1+1.8.Similarly when we talk about parity and gestational age, these two variables were found comparable with a mean value of parity similar in both groups and mean gestational age of 39.6+1.2 in Group A and 39.2+1.8 in group.

Table 2:

S. No	Variable	Group A	Group B	Chi	p-value
1.	Pain	32	11	15.98	0.00064*
2.	Fever	12	7	1.5633	0.2111
3.	Wound Seroma	15	6	4.6753	0.030*
4.	Superficial Tissue Breakdown	6	5	0.1001	0.7517
5.	SSI	4	3	0.1517	0.69

[Table 2] Both groups are compared with variables of post operative wound complications and results shows that the pain and wound the wound seroma have significant higher presence in group A[subcutaneous stitch].p-value for these two variables are found significant in our studies,0.00064 and 0.030 for pain and wound seroma respectively. Other

than these two variables rest of all have no significant difference. The number of patients suffering from post operative fever was a little higher in group A but the p-value, 0.2111, was not significant. SSI and superficial wound breakdown have a p-value of 0.69 and 0.7517 respectively which is not significant.

Discussion

One hundred and twenty eligible women were studied and randomly divided into two equal groups. There is no doubt that obesity is a added risk factor for abdominal surgical wound infections but neither obesity nor calculated index of obesity i.e,BMI, independently, is related to wound complications. The determining factor is thickness of subcutaneous fat at the site of surgical incision [vermillion et al].

The patients were comparable to each other regarding age,BMI,parity and gestational age as shown in table:1of their demographic data.

There was significant difference in post operative pain in both groups when compared on VAS score. Group-A [Subcutaneous Drain] patients experience lesser pain than Group -B [Subcutaneous stitch]; and this difference was significant with a p-value of 0.00064. CASEAR study; 2010 also concluded that there is significant reduction in post-operative pain after usage of subcutaneous drain. Another study by Kumar; 2014 have the same results. Both these study used the VAS as semi-objective tool for assessment of pain.

No difference was seen in the results for post-operative fever; in our study post-operative fever was defined as a temperature more than or equal to 38o c or more after 24 hours post-operatively. Exclusion of first 24 hrs was done to exclude the reactionary fever that may be the result of the surgical trauma itself. Any requirement of antibiotics not included as in that case there may be confusion with sepsis. A review conducted by Gates et al [Gates and Anderson, 2005] found no difference in results when compared these two different techniques for abdominal wound outcomes in cesarean section.

No significant difference was seen when both the techniques were compared for other outcomes as superficial tissue breakdown and SSI [surgical site wound infection].Here SSI was defined according to the centre of disease control and prevention [CDC] criteria.

There was a significant difference with a p-value of 0.030 in both groups when compared for wound seroma.The drain group shows better results compare to the subcutaneous stitch group to avoid the complication of wound seroma.Enkin [1995], conducted a Cochrane systemic review to evaluate role of routine wound drainage in cesarean section and in this review two trials [Loong et al., 1988; Saunders and Braclay, 1988] were included. The conclusion shows benefit of drainage when hemostasis was inadequate but routine use had no added benefits.

Allaire et al reported that there is higher incidence of

overall complications in women who received neither drain or stitch in their subcutaneous space as compared to the group that received either subcutaneous suture or drain.

A study done by Gallup et al reported that incident of wound breakdown in obese patients was only 2% when they used drain with proper prophylactic antibiotics than 10% when antibiotics were not used.

Magann and colleagues found the efficacy of subcutaneous drain through a prospective trial of 964 women undergoing cesarean delivery and found comparable major wound complication rates among women who received no subcutaneous closure(8.7%) compared to those receiving subcutaneous drain(9.7%) or suture(9.9%).

Chelmow et al confirmed the benefits of subcutaneous suture closure in a recent meta analysis of 5 randomized trials that demonstrated that subcutaneous closure in women with 2 cms or more subcutaneous tissue thickness were associated with significant less wound complications than wounds with no suture.

Strength and Weakness

When we talk about strength; in this study two different techniques were compared in a randomized way where demographic data's are absolutely comparable. In most of the studies the comparison was done with a technique either drain or subcutaneous stitch with no technique to minimize the subcutaneous space and its collection.

But the dangling drain always caused discomfort to patients which is not considered or compared in our study as well results were not compared differently for elective and emergency cesarean section as we all know complications are more prone to emergency sections.

Conclusion

To conclude we found placing a subcutaneous drain is little more effective way of preventing wound complications of cesarean section abdominal incision in obese female whose subcutaneous layer thickness is 2.5cms or more, as postoperative pain and wound seroma formation reduces with help of drain.

But there was no difference seen in other complication as post-operative fever, superficial wound breakdown or SSI.The number of women suffering from these conditions were almost similar.

Delivery of a baby whether by vaginal route or cesarean section is a moment in the change in the life of a woman as not only she has to take care of herself but the newborn also. Luckily after a normal vaginal delivery it can more comfortably done but after an operative delivery it becomes very difficult for the woman. Abdominal incision disruption after cesarean section is a major source of morbidity, this is not only responsible for physical discomfort but it causes mental agony as well. Mother feels nursing her baby more difficult, her stay in hospital increases.So, this issue should be taken more seriously and a better way to reduce morbidity should be discovered. A larger definitive trial is needed to clarify the clinical utility of prophylactic

subcutaneous drain in cesarean section.

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How to cite this article: Najam R, Suman D, Pandey S. Subcutaneous Drain Versus Subcutaneous Suture Reapproximation: A Randomised comparative Study In Obese Patients Undergoing Cesarean Section. *Asian J. Med. Res.* 2018;7(2):OG01-OG04.
DOI: [dx.doi.org/10.21276/ajmr.2018.7.2.OG1](https://doi.org/10.21276/ajmr.2018.7.2.OG1)

Source of Support: Nil, **Conflict of Interest:** None declared.