Subcutaneous Tissue Reapproximation Alone or in Combination with Drain in Obese Women Undergoing Cesarean Section Through Pfannenstiel incision

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Abstract: Background: Cesarean section in these women poses many surgical, anesthetic, and logistical challenges. In view of the increased risk of cesarean delivery in morbidly obese women, A Medline search was conducted to review the recent relevant articles in English literature on cesarean section in morbidly obese women. The types of incisions and techniques used during cesarean delivery, intra-operative and postpartum complications, anesthetic and logistical issues, maternal morbidity and mortality were reviewed. Morbidly obese women are at increased risk of pregnancy complications and a significantly increased rate of cesarean delivery [(3), (4)]. ***Aim of the work:*** Evaluation of the benefits of subcutaneous tissue reapproximation alone or in combination with drain in obese women undergoing cesarean section through pfannenstiel incision. ***Patients and Methods:*** This trial was conducted in 200 females in Bab Elshaarea hospital. We will conduct a randomized trial of women undergoing cesarean delivery. Consenting women with body mass index (BMI) greater than 30 kg/m2 and 4cm or more thickness of subcutaneous tissue then randomized them to either subcutaneous suture closure alone (n =100) or suture plus drain (n =100). The drain (Nelaton catheter size 10 F (3.3mm)) will be attached just below the wound for 24 hours then will be removed followed by disinfecting the wound using betadine 10% and will be covered by sterile dressing for 7 days. The primary study outcome is a composite wound morbidity rate (defined by any of the following: subcutaneous tissue dehiscence, seroma, hematoma, abscess, or fascial dehiscence). A second wound follow-up assessment will be performed 4–6 weeks later at the time of postpartum evaluation. ***Results:*** We explored the efficacy of suture plus drain compared with suture alone subcutaneous closure within several specific population subgroups at high risk for postcesarean wound complications., no significant differences were noted between the suture-alone (n = 30) and suture plus drain (n=33) groups with respect to the composite wound morbidity rate (32.5% versus 32.2%). Individual post cesarean wound complication rates in suture plus drain group versus suture alone group showed composite wound morbidity (14.8% versus 19.7%), subcutaneous dehiscence (12.5% versus 17.7%,), seroma (4.3% versus 7.3%), hematoma (2.3% versus 4.2%), abscess (1.1% versus 3.1%), fascial dehiscence (3.2% versus 5.2%), and hospital readmission for wound complications (5.4% versus 8.4%) respectively. ***Conclusion:***. The additional use of a subcutaneous drain along with a standard subcutaneous suture Reapproximation technique is effective for the prevention of wound complications in obese women undergoing cesarean delivery.

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Introduction

Maternal obesity has become one of the most commonly occurring risk factors in obstetric practice [(1)].

Obesity in pregnancy is usually defined as a Body Mass Index (BMI) of 30 kg/m2 or more at the first antenatal consultation.

There are three different classes of obesity:

BMI 30.0–34.9 (Class I), BMI 35.0–39.9 (Class 2), BMI 40 and over (Class 3 or morbid obesity) Morbid obesity has a dramatic impact on pregnancy outcome [(2)].

Cesarean section in these women poses many surgical, anesthetic, and logistical challenges. In view of the increased risk of cesarean delivery in morbidly obese women, A Medline search was conducted to review the recent relevant articles in English literature on cesarean section in morbidly obese women. The types of incisions and techniques used during cesarean delivery, intra-operative and postpartum complications, anesthetic and logistical issues,

maternal morbidity and mortality were reviewed. Morbidly obese women are at increased risk of pregnancy complications and a significantly increased rate of cesarean delivery [3], [4].

Low transverse skin incisions and transverse uterine incisions are definitely superior and must be the first option. Closure of the subcutaneous layer is recommended by some surgeons [5] while others recommend placement of subcutaneous drains [6], [7].

Because of the risk for wound complications in obese women, efforts to reduce these complications are of great importance [8]. Reduction in operative time, use of perioperative prophylactic antibiotics, irrigation of the operative site, adequate hemostasis, avoidance of dead space, and meticulous surgical technique have been shown to help reduce the risk for postoperative wound complications the obese patient poses additional concerns with respect to increased abdominal wall thickness. colleagues have previously demonstrated that subcutaneous tissue thickness of 3 cm or more is an independent risk factor for wound infection following cesarean delivery.

Patients and Methods

This trial was conducted in 200 females in Bab Elshaarea hospital**.**

We will conduct a randomized trial of women undergoing cesarean delivery. Consenting women with body mass index (BMI) greater than 30 kg/m2 and 4cm or more thickness of subcutaneous tissue then randomized them to either subcutaneous suture closure alone (n =100) or suture plus drain (n =100). The drain (Nelaton catheter size 10 F (3.3mm)) will be attached just below the wound for 24 hours then will be removed followed by disinfecting the wound using betadine 10% and will be covered by sterile dressing for 7 days.

The primary study outcome is a composite wound morbidity rate (defined by any of the following: subcutaneous tissue dehiscence, seroma, hematoma, abscess, or fascial dehiscence).

A second wound follow-up assessment will be performed 4–6 weeks later at the time of postpartum evaluation.

Inclusion criteria:

(1) ability to give informed consent,

(2) women with a body mass index (BMI) greater than 30 kg/m2.

(3) age not more than 40 years.

(4) primigravida or 1 or 2 previous cesarean section.

Exclusion criteria:

(1) women with a body mass index (BMI) lesser than 30 kg/m2.

(2) patient with altered immunity or taking immunosuppressive drugs.

(3) associated risk factors such as diabetes, hypertension, systemic vascular disease..... etc.

(4) severely debilitating illness.

Women who met the above requirements were invited to participate, and those who gave informed consent were followed through delivery in the event that cesarean delivery was required. All women who consented to participate and required cesarean delivery underwent standard perioperative management (surgical preparation and prophylactic antibiotics). Intraoperatively, following closure of the fascia, the patient's subcutaneous tissue depth was measured with a sterile ruler.

Women with a subcutaneous tissue thickness of 4.0 cm or more were then formally enrolled and randomized to one of the two subcutaneous closure techniques.

Randomization was accomplished by using sequentially numbered and sealed opaque envelopes located in the operating suite to maintain concealed treatment allocation. Randomized women were assigned to treatment with either subcutaneous tissue reapproximation alone using a running, nonlocking 2–0 Vicryl closure or to subcutaneous suture closure with the additional placement of drain (Nelaton catheter size 10 F (3.3mm).

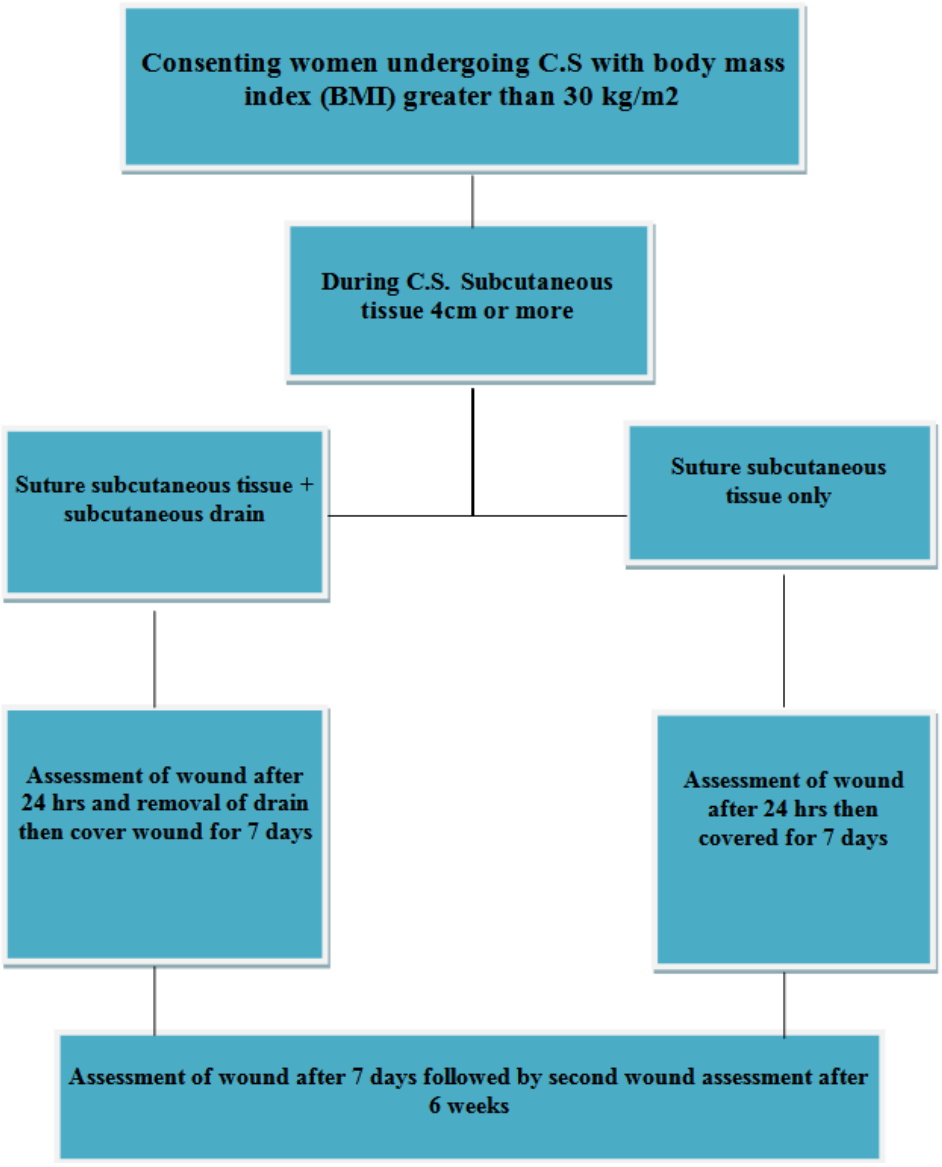
Before suture or drain placement, the subcutaneous space was thoroughly irrigated, and subcutaneous bleeding was secured with cautery. For those women randomized to the drain group, the drain was placed above the suture closure, exiting the wound via the last suture. After subcutaneous closure, the skin incision was sutured subcuticular using 2-0 proline.

filament. All randomized women received standard postoperative wound care. For women in the subcutaneous drain group, the drain was removed 24 hours after surgery.

Wound complications that occurred at any time during the initial 6-week postoperative period were recorded.

All study patients had a scheduled follow-up visit 7–14 days after hospital discharge, at which time the proline filament was removed and formal wound assessment performed by trained study personnel. A second wound follow-up assessment was performed 4–6 weeks later at the time of postpartum evaluation. The primary study outcome for the investigation was the overall composite wound morbidity rate, defined as any of the following noted during the post– hospital discharge wound follow-up assessments: subcutaneous dehiscence (> 1 cm), seroma, hematoma, abscess, or fascial dehiscence. Secondary study outcomes included the individual wound complication rates for subcutaneous dehiscence (> 1

cm), seroma, hematoma, abscess, fascial dehiscence, and hospital readmission for wound complication.



Results

From May 2016 to February 2017, a total of 200 women were enrolled Ninety women (190/200) had a follow-up wound assessment. Baseline characteristics of the study participants, including maternal age, weight, BMI (Table 1).

Table (1): Baseline Characteristics of Study Cohort.

	Suture + Drain	**Suture alone**	**Independent t-test**	
	(n= 94)	**(n= 96)**	**t/X²**	**P-value**
Maternal age (Y)	28.4 ± 5.2	27.8 ± 4.5	0.724	0.396
Weight (Kg)	121.4 ± 15.5	123.5 ± 12.7	1.045	0.308
BMI (kg/m²)	45.5 ± 8.1	46.8 ± 7.8	1.270	0.261

P > 0.05: NS

Mean (± standard deviation) interval from cesarean delivery to initial wound assessment was similar between the suture plus drain group (11.1 ± 7.2 days, median 9 days) and the suture-alone group (12.8 ±14.0 days, median 9 days).

The interval from surgery to diagnosis of wound complication was similar between the suture plus drain group (11.1 ± 7.1 days, median 10 days) and suture-alone suture group (9.7 ± 7.4 days, median 8 days).

The incidence of composite wound morbidity was similar between the suture plus drain and suture-alone groups (Table2). Individual wound complication rates, including subcutaneous dehiscence, seroma, hematoma, abscess, fascial dehiscence, and hospital readmission for wound complications were also similar between the study groups (Table 2). Composite wound morbidity, as well as individual wound complications, were not significantly associated with the subcutaneous tissue closure technique after controlling for participant BMI (Table 2).

We explored the efficacy of suture plus drain compared with suture alone subcutaneous closure within several specific population subgroups at high risk for postcesarean wound complications., no significant differences were noted between the suture-alone (n = 30) and suture plus drain (n=33) groups with respect to the composite wound morbidity rate (32.5% versus 32.2%). Individual post cesarean wound complication rates in suture plus drain group versus suture alone group showed composite wound morbidity (14.8% versus 19.7%), subcutaneous dehiscence (12.5% versus 17.7%,), seroma (4.3% versus 7.3%), hematoma (2.3% versus 4.2%), abscess (1.1% versus 3.1%), fascial dehiscence (3.2% versus 5.2%), and hospital readmission for wound complications (5.4% versus 8.4%) respectively.

Table (2): Study Outcomes.

	Suture + Drain		**Suture alone**		**Chi-square test**	
	No.	**%**	**No.**	**%**	**X^2**	**P-value**
Wound dehiscence (%)	12	12.5%	17	17.7%	0.897	0.343
Seroma (%)	4	4.3%	7	7.3%	0.803	0.370
Hematoma (%)	2	2.3%	4	4.2%	0.646	0.422
Abscess (%)	1	1.1%	3	3.1%	0.979	0.322
Fascial dehiscence (%)	3	3.2%	5	5.2%	0.479	0.489
Readmission for wound complication (%)	5	5.4%	8	8.4%	0.000	1.000
Composite wound morbidity (%)	14	14.8%	19	19.7%	0.794	0.373

Discussion

wound complications remain a major concern for women undergoing cesarean delivery. However The potential benefits of subcutaneous drainage are conflicting in the literature. Previous studies have evaluated the independent use of subcutaneous drainage to prevent wound complications in women undergoing cesarean delivery and compared the use of subcutaneous suture closure with subcutaneous drain in women undergoing cesarean delivery.

These investigators demonstrated a reduction in the wound complication rate in women who received subcutaneous drain when compared with women treated with suture closure or those receiving neither drain nor suture subcutaneous closure. For our investigation, we evaluated the concurrent use of a drain with suture subcutaneous tissue reapproximation under the hypothesis that the concurrent use of postsurgical drainage of the subcutaneous space theoretically would provide further reduction in potential dead space and removal of residual fluid and blood from the wound that could serve as a medium for bacterial growth. We selected women with 4 cm or more of subcutaneous tissue thickness for randomization into our trial to evaluate efficacy in a population at greatest risk for postcesarean wound complications. In spite of our selection of a high-risk population for study, the additional use of a subcutaneous drain along with a standard subcutaneous suture reapproximation technique was effective for the prevention of wound complications in obese women undergoing cesarean delivery.

Although the 2 closure techniques were statistically similar for the composite wound morbidity rate and individual morbidities, the composite wound morbidity rate and rates of wound dehiscence and wound abscess were higher in women in the subcutaneous suture-alone group than in women in the drain plus suture group. Although this difference was not significant the observation is of interest and raises potential concerns regarding the

role of subcutaneous drainage in obese women undergoing cesarean delivery.

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