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ORIGINAL ARTICLE

A STUDY TO COMPARE THE EFFICACY OF SUBCUTANEOUS SUTURE REAPPROXIMATAION VERSUS SUBCUTANEOUS DRAIN FOR THE PREVENTION OF WOUND COMPLICATION IN WOMEN UNDERGOING CAESAREAN SECTION

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ABSTRACT: Obesity has been linked as a risk factor for wound complication and is becoming a more common occurrence. We reviewed the risk factors, preventive strategies and recommended management of wound complication in women undergoing caesarean section. The limited available data support the use of prophylactic antibiotic before caesarean delivery, closure of subcutaneous space >2cm and maintaining normothermic intra-operatively to help reduce the incidence of postoperative wound complication. There is a need for randomized controlled trials which evaluate the prevention and management of wound complications in obese women undergoing caesarean delivery.

KEYWORDS: Subcutaneous stitch, obese women, caesarean delivery, subcutaneous drain, wound complication.

INTRODUCTION: In an era where the rate of caesarean delivery and obesity are on the rise, delineation of optimal surgical technique to minimize the complication from caesarean delivery is of great clinical importance.(1) The rate has increased to 15% recommended by WHO. In spite of successful operation, the post-operative period in obese patient the risk of thrombo embolic, infections and pulmonary complications, wound infection rate is 29% in obese patient as compared to 4% in non-obese patients.(2) The post-operative woud infections, Seroma, dehiscence and hematomas are becoming more prevalent.(3,4) Although closure of subcutaneous fat may decrease serous fluid collection, additional suture may itself act as an inoculums and increase the risk of wound infection. Though the use of subcutaneous drain to prevent wound complications is controversial.

AIM OF STUDY: The study is taken to detect whether subcutaneous stitch closure or subcutaneous drain or neither of it helps in preventing wound disruption secondary to infections, seromas, or haematomas.

MATERIALS AND METHODS: A prospective randomized controlled study comparing the efficacy subcutaneous sutures re-approximation versus subcutaneous drain for prevention of wound complications in women undergoing caesarian section was carried out over a period of 2 ½ years with department of obstertetrics and gynecology a total of 150 patients were studied irrespective of indications, medical complications high risk factors and history of previous

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caesarian section where included in the study. All patients with atleast two centimeters subcutaneous fat where eligible for the study. Three groups of 50 patients each,

GROUP-A: Use of subcutaneous section drain.

GROUP-B: Use of subcutaneous stitch with vicryl.

GROUP-C: Neither drain nor sutures.

Type of adnominal incision was Pfannenstiel and all uterine incision, were lower segment. Following closure of rectus sheets, the subcutaneous space was measured with a sterile calibrated scale in the middle of incision.

In Group-A patients nasogastric tube No.6 was placed in subcutaneous space.

In Group- B patients the subcutaneous space was sutured by vicryl with interrupted sutures.

In Group-C patients neither suture nor drain was placed.

Drain was removed after 48 hours or when the drain aged was less than 15 ML in 24 hours. All patients received antibiotic for 7 days sutured removal was done after 7 days. Primary outcome measures noted were wound infection, disruption, sermons and hematoma. Secondary outcome noted were post-operative pain, febrile morbidity and period of hospitalization. The data and the result in all the three groups were compared and analyzed. Chi-Square tests were applied to test the significance of the result.

OBSERVATIONS AND RESULTS:

Type of Closure		Pain	Total
		N	
Drain	Count	50	50
	% within type of s.	100.0%	100.0%
	% within Pain	33.3%	33.3%
	% of Total	**50**	**50**
None	Count	50	50
	% within type of s.	100.0%	100.0%
	% within Pain	33.3%	33.3%
	% of Total	**33.3%**	**33.3%**
Stitch	Count	50	50
	% within type of s.	100.0%	100.0%
	% within Pain	33.3%	33.3%
	% of Total	**33.3%**	**33.3%**
Total	Count	150	150
	% within type of s.	100.0%	100.0%
	% within Pain	100.0%	100.0%
	% of Total	**100.0%**	**100.0%**

Table 1: Type of Closure vs Pain

Among 150 patients there was not much difference noted in the intensity of pain among different types of Closure under study & the pain scale in the patients was form 1-6 i.e mild to moderate, (frequently distribution remains constant).

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Type of Closure		Fever		Total
		N	Y	
Drain	Count	49	1	50
	% within group.	98.0%	2.0%	100.0%
	% within column	32.9%	100.0%	33.3%
	% of Total	**32.7%**	**7%**	**33.3%**
None	Count	50	0	50
	% within group	100.0%	.0%	100.0%
	% within column	33.6%	.0%	100.0%
	% of Total	**33.3%**	**.0%**	**33.3%**
Stitch	Count	50	0	50
	% within group.	100%	.0%	100/0%
	% within column	33.6%	.0%	33.3%
	% of Total	**33.3%**	**.0%**	**33.3%**
Total	Count	149	1	150
	% within group.	99.3%	.7%	100.0%
	% within column	100.0%	100.0%	100.0%
	% of Total	**99.3%**	**.7%**	**100.0%**

Table 2: Type of Closure vs Fever

Chi-Square Tests			
	Value	df	Asymp. Sig. (2- sided)
Person Chi-Square	2.013[a]	2	.365

Fever was defined as temperature elevation of >38.5 degree centigrade on two occasions 4 hours apart from the first 24 hours.

Out of 150 patients 1 patient from Group-A complaint of fever, but there was no wound gape.

From the above table it is clear that the significance value P >0.65 therefore there is no significant different in the frequency of females complaining for Fever among given closure methods.

Type of Closure		Seroma		Total
		N	Y	
Drain	Count	50	0	50
	% within group.	100.0%	.0%	100.0%
	% within column	33.6%	.0%	33.3%
	% of Total	**33.3%**	**.0%**	**33.3%**
None	Count	50	0	50
	% within group.	100.0%	.0%	100.0%
	% within column	33.6%	.0%	33.3%
	% of Total	**33.3%**	**.0%**	**33.3%**

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Stitch	Count	49	1	50
	% within group.	98.0%	2.0%	33.3%
	% within column	32.9%	100.0%	33.3%
	% of Total	**32.7%**	**.7%**	**33.3%**
Total	Count	149	1	150
	% within group.	99.3%	.7%	100.0%
	% within column	100.0%	100.0%	100.0%
	% of Total	**99.3%**	**.7%**	**100.0%**

Table 3: Type of Closure Vs Seroma

Chi-Square Tests			
	Value	df	Asymp. Sig. (2- sided) P
Person Chi-Square	2.013[a]	2	.365

Seroma was defined as presence of serous fluid in the absence of infection.

Among 150 patients 1 patient from group B had Seroma formation and there was gaping of wound.

Since from the above table it is clear that the P >0.05, there is no significant difference in Seroma cases among closure methods under study. Whatever difference occurred is just due to the sampling error or by chance.

Type of Closure		**Infection**			**Total**
		Candida	**Diphtheria**	**N**	
Drain	Count	0	0	50	50
	% within group.	.0%	.0%	100.0%	100.0%
	% within column	.0%	.0%	34.0%	33.3%
	% of Total	**.0%**	**.0%**	**33.3%**	**33.3%**
None	Count	0	0	50	50
	% within group.	.0%	.0%	100.0%	100.0%
	% within column	.0%	.0%	34.0%	33.3%
	% of Total	**.0%**	**.0%**	**33.3%**	**33.3%**
Stitch	Count	2	1	47	50
	% within group.	4.0%	2.0%	94.0%	100.0%
	% within column	100.0%	100.0%	32.0%	33.3%
	% of Total	**1.3%**	**.7%**	**31.3%**	**33.3%**
Total	Count	2	1	147	150
	% within group.	1.3%	.7%	98.0%	100.0%
	% within column	100.0%	100.0%	100.0%	100.0%
	% of Total	**1.3%**	**.7%**	**98.0%**	**100.0%**

Table 4: Type of Closure Vs Infection

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Chi-Square Tests			
	Value	df	Asymp. Sig. (2- sided)
Person Chi-Square	6.122[a]	4	.190

Infection was defined as wound that had 2 of the following: drainage of purulent material, erythema, tenderness, induration, or fever, and if it required opening and drainage or change of antibiotics. Among 150 patients 2 patients from group B were reported with Candid infection & 1 patient with Diphtheria from the same group. All the 3 patients had wound gape & had to undergo secondary re suturing after appearance of healthy granulation tissue.

Since from the above table it is clear that the P <0.05, there is no significant difference infection cases among closure methods under study. Whatever the difference occur is just due to the sampling error or just by chance.

Type of Closure		Disruption		Total
		N	Y	
Drain	Count	50	0	50
	% within group.	100.0%	.0%	100.0%
	% within column	34.2%	.0%	33.3%
	% of Total	**33.3%**	**.0%**	**33.3%**
None	Count	49	1	50
	% within group.	98.0%	2.0%	100.0%
	% within column	33.6%	25.0%	33.3%
	% of Total	**32.7%**	**.7%**	**33.3%**
Stitch	Count	46	4	50
	% within group.	92.0%	8.0%	100.0%
	% within column	31.7%	80.0%	33.3%
	% of Total	**30.6%**	**2.66%**	**33.3%**
Total	Count	145	5	150
	% within group.	96.6%	3.4%	100.0%
	% within column	100.0%	100.0%	100.0%
	% of Total	**96.6%**	**3.4%**	**100.0%**

Table 5: Type of Closure Vs Disruption

Chi-Square Tests			
	Value	df	Asymp. Sig. (2- sided)
Person Chi-Square	3.596[a]	2	.166

Disruption was defined as separation of 1 cm or more that required drainage, packing, healing by secondary intention and/ or debridement with secondary suturing. Among 150 patients

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4 from Group B & 1 from Group-C had wound disruption due to infection & Seroma formation. In these patients the subcutaneous fat thickness was ranging from 2cm-3cm.

Since from the above table it is clear that the P <0.05, there is no significant difference in Disruption cases among closure methods under study. Whatever difference occurred is just due to the sampling error.

	N	Minimum	Maximum	Mean	Std. Deviation
Age	150	19.00	40.00	25.8867	4.47294
Weight	150	39.00	98.00	62.1700	9.73850
OT time Hr	150	1.00	2.50	1.2767	.34533
Height	150	123.98	169.34	1.5345E2	9.83223
Hospital Stay (days)	150	4	28	9.0467	4.17621
Valid N (listwise)	150				

Combined Descriptive Statistics

Type of Closure	Age				
	Count	Minimum	Maximum	Mean	Standard Deviation
Drain	50	19.00	40.00	26.42	4.63
None	50	19.00	38.00	25.72	4.61
Stitch	50	19.00	34.00	25.52	4.21

Descriptive Statistics for Age

Among 150 patients minimum age was 19 years & maximum was 40 years mean being 25.52-26.42 years.

Type of Closure	Height				
	Count	Minimum	Maximum	Mean	Standard Deviation
Drain	50	123.98	166.32	153.69	10.00
None	50	123.98	166.32	151.70	11.26
Stitch	50	124.29	169.34	154.96	7.86

Descriptive Statistics for Height

Among 150 patients minimum height was 123.98 CM & maximum was 169.34 mean being 151.70-154.96 Cm.

Type of Closure	Age				
	Count	Minimum	Maximum	Mean	Standard Deviation
Drain	50	50.00	90.00	65.52	9.60
None	50	39.00	83.00	61.73	9.20
Stitch	50	41.00	98.00	59.26	9.55

Descriptive Statistics for Weight

Among 150 patients minimum weight was 39 KG & maximum was 98 KG mean being 59.26-65.52 KG.

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However from the above tables of age, height & weight it was statistically found that these factors were not responsible for wound gape in the study group.

A calculated BMI was also statistically insignificant factor for wound gape.

Type of Closure	Age				
	Mean	Minimum	Maximum	Count	Standard Deviation
Drain	2.79	2.00	6.00	50	.73
None	2.79	2.00	6.00	50	.73
Stitch	2.52	2.00	5.00	50	.68

Descriptive Statistics for Subcutaneous Fat

Fat thickness was measured intra operatively after rectus sheath closure with a sterile metallic scale in the center of the incision.

Among 150 patients, minimum fat thickness was 2 cm & maximum was 6 cm mean being 2.52 cm – 2.79 cm.

Patients with wound gape had fat thickness ranging from 2cm – 3cm.

DISCUSSION: Abdominal incision disruption after caesarean section is a major source of morbidity. Infection, Seroma or hematoma formation can disrupt skin closure or necessitate opening the incision for drainage and possible subsequent infection. The incident of post caesarean wound disruption is 2 to 22.7%.[5,6] Wound disruption delays recovery, prolonged hospitalization, readmission or prolonged out-patient treatment and increase hospital cost besides causing psychological trauma to the patient. It is therefore important to identify risk factor and treatment modalities that can decrease the incident of these complications.

Obesity has long been regarded as an independent risk factor for abdominal wound infection, usually obesity is equated with increased weight. Weight is responsible for other medical complications in the obese but in itself does not place the patient at increased risk fall wound complications nor does a calculated index of obesity i.e. BMI.[7] What determines it that thickness of subcutaneous at the site of wound as proved in a number of studies.[6,8] The thickness of the subcutaneous fat layer undoubtedly has a direct bearing on wound infection and failure of healing (Pitkin 1976).[6,8,9]

In 1977 Morrow et Al suggested modifications of pre-operative, intra-operative and post-operative care in obese patients and noted 13% wound infection rate in his study of 39 patients.[10]

According Soper et Al, obese patients with a subcutaneous tissue depth of more than 6cms have 40% of probability of having wound infection are complications. In our study the minimum fat thickness was 2cms and maximum of 6cms, however, patients with wound gape due to infection or Seroma formation had subcutaneous fat from 2 cm-3cms. So our study does not endorse this.

Kivisaari et al has shown that wounds with large areas of dead space remains hypoxic.[11,12] In addition, increased dead space may lead to an increased in wound fluid acting as a suitable culture medium for contaminating microorganisms.

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Allaire et al reported higher incidence of overall complication rate as well as major complications (disruption or infection) in women who received neither subcutaneous suture nor drain as compared to the group that received either subcutaneous suture closure or subcutaneous drain.[13]

Del Valle et al (1992) published a randomized study comparing closure of subcutaneous tissue with non-closure during the caesarean in obese patient and demonstrated reduction in post-operative wound disruption as a result of dead space obliteration in closure group.[14]

However, in our study there was a one case from Group-A that reported Seroma formation. However this was statistically insignificance.

Gallup et al (1996) showed that the incident of wound break down in obese patient was only 2% when drain was used along with prophylactic antibiotics as compared 10% when antibiotics were not used.[15]

CONCLUSION: From the study we would like to conclude that:

1. There is no beneficial trend in the use of subcutaneous drain or stitch in women undergoing caesarean section with subcutaneous fat more than or equal to 2 cms.
2. Apart from PIH and Anemia no other factor like age, height, weight, BMI, medical illness like DM, HT, etc., were found responsible for wound disruption in these patients.
3. Use of prophylactic antibiotic treatment, modified operative techniques, an active recovery regime view towards and more sanguine view towards the surgical care or obese women can reduced wound complications.

So, our study recommends that either of the methods i.e. subcutaneous closure, subcutaneous drain or neither of it is more beneficial to prevent wound disruption.

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