OPEN AIMJ ORIGINAL ARTICLE

Obstetrics & Gynecology

Non-Suture Skin Closure Technique for Cesarean Section as an Alternative to Usual Methods

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Received *for publication December 06, 2021;* ***Accepted*** *November 21, 2022;* ***Published online*** *November 21, 2022.*

doi: *10.21608/aimj.2022.109838.1710*

Citation: *Ibrahim M. , Abdelrahman M. and Ibrahim R. Effect of Early Postoperative Feeding on Gastrointestinal Tract Motility after Cesarean Section. AIMJ. 2022; Vol.3-Issue11 : 94-97.*

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ABSTRACT

Background: Cesarean section (CS) is one of the most frequent abdominal procedures. A meta-analysis regarding the techniques and materials used for skin closure in CS shows no conclusive evidence about how the skin should be closed with the best outcome. Thus, any modified skin closure technique that could reduce the incidence of wound complications and pain would have a significant impact on the national economic health plans.

Aim of the work: To estimate the outcome of non-suture skin closure method of CS wound as an alternative to usual methods.

Patients and methods: This study was a prospective case control study that recruited 100 pregnant women +/- 38 week opting for a caesarean section, at Bab Al-Sharia University Hospital, during the period between January 2021 to June 2021.

Results: In the present study the post-operative pain score in steri-strips group was 3.72 ± 1.28 while in subcuticular group was 4.78 ± 1.67 with P =< 0.001, which was highly statistically significant, and it is helps in patients to ambulate faster and get discharged faster than with subcuticular suture.

Conclusion: This new non-suture technique (Steri-Strip S closures) can be an alternative or even a better option in regard to suture skin closure, and other methods used during CS, because they can be applied rapidly, are inexpensive, painless, optimize cosmesis, and limit the chance of infection.

Keywords: *Non-Suture Skin Closure Technique; Cesarean Section, Complications.*

Disclosure: *The authors have no financial interest to declare in relation to the content of this article. The Article Processing Charge was paid for by the authors.*

Authorship: *All authors have a substantial contribution to the article.*

INTRODUCTION

Cesarean section (CS) is the most frequent abdominal procedure conducted in women all over the world. A meta-analysis studying the techniques and materials used for skin closure in CS shows no definitive evidence about how the best outcome of the skin closure could be achieved. [1]

Post cesarean section wound complications occur in 5% of women who have undergone CS, which include hematomas, seromas, infection, and pain, that might further lead to wound dehiscence. Obesity or thick subcutaneous tissue (> 3 cm) may have a bad effect on the wound healing. [1]

Staples have similar results regarding wound infection, pain, and cosmetic results when compared to sutures. Both techniques are the most commonly used techniques for skin closure during CS. Staples should not removed before three days post-CS, as this may lead to an increased possibility of skin separation and the need for re-closure compared to subcuticular sutures. [2]

A meta-analysis conducted by Pergialiotis et al. includes ten RCTs involving 3696 women, viewed that the subcutaneous tissue closure technique during CS results in lower wound complications. [3]

The trial of a new technique of skin closure could reduce the incidence of wound complications and pain and would have a significant impact on the national economic health plans. [3] So, an introduction of a new non-suture technique for skin closure is being tried.

Aim of the work is to estimate the outcome of non-suture skin closure method of CS wound as an alternative to usual methods.

PATIENTS AND METHODS

This study was a prospective case control study that recruited 100 pregnant women +/- 38 week opting for a caesarean section, at Bab Al-Sharia University Hospital, during the period between January 2021 to June 2021.

This study was divided into two groups:

Group 1: (Steri-strips Group) 50 patients were undergoing non-suture skin closure method for CS wound. The skin was not closed with any suture but was opposed with a pack of steri-strip then the wound was covered with waterproof patch for 14 days, after which, the steri-strips was removed.

Group 2: (Subcuticular Group) 50 patients were undergoing classic skin closure using subcuticular sutures immediately below the skin layer, by an continuous suture, using polypropylene 2-0 (Prolene) sutures.

Inclusion criteria: Patients agreed to be included in the study, patients aged 18 to 35, pregnant Women, Gestational Age +/- 38 weeks, patients opting for elective caesarean section, BMI < 27, patients' hemoglobin ≥ 10 g/dl, primiparous and multiparous patients, no medical disorders such as DM and/or hypertension, no dermatological diseases such as Psoriasis or Scleroderma, no autoimmune disease affecting wound-healing, and no drug intake affecting wound-healing.

Exclusion criteria: Patients refused to be included in the study, patients suffering from medical disorders affecting wound-healing, eg. DM, patients suffering from dermatological diseases, patients suffering from autoimmune diseases eg. SLE, BMI > 27, patient's haemoglobin < 10 g/dl, patients requiring urgent CS eg. obstructed labour, cord prolapse, malpresentations, placenta previa, and obstetric disorders eg. gestational DM, gestational HTN, PE, obstetric cholestasis.

The study was presented for approval from ethical committee of the Department of the Obstetrics and Gynecology, Faculty of Medicine, Al-Azhar University

All cases were subjected to the following:

Consent: all participants in the study were received both oral and written informed consent after explaining the details of the study for them, as agreed upon by the ethical committee.

Full history-taking.

General examination: BP, Pulse, RR, Temperature, BMI.

Abdominal examination.

Ultrasound for assessment and follow up.

Routine investigation in the form of complete blood count, coagulation profile, liver function tests and kidney function tests was done.

Statistical analysis:

Statistical presentation and analysis of the present study was conducted, using the mean, standard deviation, unpaired student t-test was used to compare between two groups in quantitative data and chi-square test was used to compare between groups in qualitative by (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.). P value < 0.05 was considered significant.

RESULTS

		Steri-strips		Subcuticular		Total	
		N	%	N	%	N	%
Cosmotic day 14:							
Excellent		10	20	3	6	13	13
Good		31	62	30	60	61	61
Fair		9	18	17	34	26	26
Total		50	100	50	100	100	100
Chi-square	X^2			6.247			
	P-value			0.044*			
Cosmotic 3month:							
Excellent		14	28	2	4	16	16
Good		30	60	33	66	63	63
Fair		6	12	15	30	21	21
Total		50	100	50	100	100	100
Chi-square	X^2			13.000			
	P-value			0.002*			
Surgical site infection day 14:							
Yes		11	22	3	6	14	14
No		39	78	47	94	86	86
Total		50	100	50	100	100	100
Chi-square	X^2			5.316			
	P-value			0.021*			
Seroma day 14:							
Yes		5	10	13	26	18	18
No		45	90	37	74	82	82
Total		50	100	50	100	100	100
Chi-square	X^2			4.336			
	P-value			0.037*			

Table 1: Comparison between two groups as regarded cosmotic day 14, cosmotic 3 month, surgical site infection day 14, and Seroma day 14.

There was statistically significant between two groups as regarded cosmotic day 14 when p-value was <0.05*. There was statistically significant between two groups as regarded cosmotic 3month when p-value was <0.05*. There was statistically significant between two groups as regarded Surgical site infection day 14when p-value was <0.05*. There was statistically significant between two groups as regarded seroma day 14 when p-value was <0.05* (Table 1).

		Steri strips		Subcuticular		Total	
		N	%	N	%	N	%
Hematoma day 14:							
Yes		4	8	14	28	18	18
No		46	92	36	72	82	82
Total		50	100	50	100	100	100
Chi-square	X^2			6.775			
	P-value			0.009*			
Keloid 3 months:							
Yes		2	4	9	18	11	11
No		48	96	41	82	89	89
Total		50	100	50	100	100	100
Chi-square	X^2			5.005			
	P-value			0.025*			

Table 2: Comparison between two groups as regarded hematoma day 14, and keloid 3 months.

There was statistically significant between two groups as regarded hematoma day 14 when p-value was <0.05*. There was statistically significant between two groups as regarded keloid 3month when p-value was <0.05* (Table 2).

Groups		Range			Mean	±	SD	T-test	P-value
Age	Steri strips	18	-	33	23.12	±	3.51	0.027	0.978
	Subcuticular	18	-	34	23.14	±	3.80		
BMI	Steri strips	19	-	26	23.38	±	2.13	0.094	0.925
	Subcuticular	19	-	26	23.42	±	2.13		
Hb	Steri strips	10	-	12	11.05	±	0.66	0.316	0.752
	Subcuticular	10	-	12	11.01	±	0.67		

Table 3: Comparison between two groups as regarded age, BMI and Hb.

There were non-statistically significant between two groups as regarded age, BMI, and Hb when p-value was >0.05 (Table 3).

Groups	Pain					T-test	
	Range			Mean	± SD	t	P-value
Steri strips	2	-	6	3.72	± 1.28	3.565	<0.001**
Subcuticular	2	-	7	4.78	± 1.67		

Table 4: Comparison between two groups as regarded pain.

There was highly statistically significant between two groups as regarded pain when p-value was <0.001** (Table 4).

DISCUSSION

In the present study the post-operative pain score in steri_strips group was 3.72 ± 1.28 while in subcuticular group was 4.78 ± 1.67 with P =< 0.001, which was highly statistically significant, and it is helps in patients to ambulate faster and get discharged faster than with subcuticular suture.

Katwala et al.[4], also reported the post-operative pain score in Suture group was 6.7 ± 0.88 while in Adhesive Tape group was 6.13 ± 0.77 with P = 0.0002, which was statistically significant.

As regards age, in this present study age ranged between 18 to 33 years in steri-strips group and 18 to 34 years among patients in subcuticular group. The Mean age of presentation in steri-strips group was 23.12 ± 3.51 years and in subcuticular group was 23.14 ± 3.80 years. There was no significant statistical difference in the age in both the groups (P=0.978).

In this present study BMI ranged between 19 to 26 kg/m^2 in steri-strips group and 19 to 26 kg/m^2 among patients in subcuticular group. The Mean BMI of presentation in steri-strips group was 23.38 ± 2.13 kg/m^2 and in subcuticular group was 23.42 ± 2.13 kg/m^2. There was no significant statistical difference in the BMI in both the groups (P=0.925).

In this present study Hb ranged between 10 to 12 gm/dl in steri-strips group and 10 to 12 gm/dl among patients in subcuticular group. The Mean Hb of presentation in steri-strips group was 11.05 ± 0.66 gm/dl and in subcuticular group was 11.01 ± 0.67 gm/dl. There was no significant statistical difference in the BMI in both the groups (P=0.752).

Also Katwala et al.[4], found no significant statistical between 2 the two groups as regards to age. The Mean age of presentation in Suture group was 50.82+15.88 years and in Adhesive Tape group was 48.20+16.04 years. There was difference in the age in both the groups (P=0.945).

In present study it was found that the day 14 post-operative seroma formation was occurred in 5 patients in steri strips group while in subcuticular group it was occurred in 13 patient with P = 0.037, which was statistically significant.

On the other hand Katwala et al.[4], seroma was not there in either group on Day 1 but on Day 3 seroma was there in 6 (12%) patients in Suture Group and in 5 (10%) patients in Adhesive Tape Group. The difference between two group is statistically not significant (P=0.763).

In present study it was found that the day 14 postoperative surgical site infections formation was occurred in 11 patients in steri strips group while in subcuticular group it was occurred in 3 patient with P = 0.021, which was statistically significant.

Eming et al. [5], found that the postoperative wound infection was occurred in 1 patients in Suture group while in Adhesive Tape group it was occurred in 1 patient with P = 1.000, which was statistically not significant.

Also Katwala et al.[4], found that the post-operative wound infection was occurred in 4 patients in Suture group while in Adhesive Tape group it was occurred in 3 patient with P = 0.705, which was also statistically not significant.

In present study it was found that the day 14 post-operative hematoma formation was occurred in 2 (4%) patients in steri strips group while in subcuticular group it was occurred in 9 (18%) patient with P = 0.025, which was statistically significant.

In present study it was found that 3 months post-operative keloid formation was occurred in 4 patients in steri strips group while in subcuticular group it was occurred in 14 patient with P = 0.009, which was statistically significant.

In present study it was found that 3 months post-operative cosmotic:

Excellent was found there in 14 (28%) patients in steri strip Group and in 2 (4%) patients in subcuticular Group. The difference between two group is statistically significant (P=0.002).

Good scar was found there in 30 (60%) patients in steri strip Group and in 33 (66%) patients in subcuticular Group. The difference between two group is statistically significant (P=0.002).

Fair scar was found there in 6 (12%) patients in steri strip Group and in 15 (30%) patients in subcuticular Group. The difference between two group is statistically significant (P=0.002).

Poor scar was not found in either group during study period.

These results agreed with the results obtained by Katwala et al.[4], that show: Excellent scar was found there in 3 (6%) patients in Suture Group and in 4 (8%) patients in Adhesive Tape Group. The difference between two group is statistically not significant (P=0.705).

Good scar was found there in 30 (60%) patients in Suture Group and in 37 (74%) patients in adhesive Tape Group. The difference between two group is statistically not significant (P=0.392).

Fair scar was found there in 17 (34%) patients in Suture Group and in 9 (18%) patients in

Adhesive tape group the difference between two group is statistically not significant (P=0.116). Poor scar was not found in either group during study period.

CONCLUSION

The choice of wound closure materials will depend on the surgeon's preference .

This new non-suture technique (Steri-Strip S closures) can be an alternative or even a better option in regard to suture skin closure, and other methods used during CS, because they can be applied rapidly, are inexpensive, painless, optimize cosmesis, and limit the chance of infection.

Conflict of interest : none

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