Al-Azhar International Medical Journal

Volume 4 | Issue 4 Article 22

2023

Comparison between Suture Closure Vs Non Closure of Subcutaneous Fat on Cosmetic outcome After Cesarean Section

Fahd Abd elaal El Omda
Department of Obstetrics and Gynecology, Faculty of Medicine for Boys, Al-Azhar University, Cairo, Egypt

Ahmed Mohamed Saeed
Department of Obstetrics and Gynecology, Faculty of Medicine for Boys, Al-Azhar University, Cairo, Egypt.

Fawzy Mohamed Fawzy Haggag
Department of Obstetrics and Gynecology, Faculty of Medicine for Boys, Al-Azhar University, Cairo, Egypt., fawzy.mo7amd@gmail.com

How to Cite This Article

El Omda, Fahd Abd elaal; Saeed, Ahmed Mohamed; and Haggag, Fawzy Mohamed Fawzy (2023) "Comparison between Suture Closure Vs Non Closure of Subcutaneous Fat on Cosmetic outcome After Cesarean Section," *Al-Azhar International Medical Journal*: Vol. 4: Iss. 4, Article 22.
DOI: https://doi.org/10.58675/2682-339X.1732

ORIGINAL ARTICLE

Comparison Between Suture Closure Versus Non Closure of Subcutaneous Fat on Cosmetic Outcome After Cesarean Section

Fahd Abd elaal El Omda, Ahmed Mohamed Saeed, Fawzy Mohamed Haggag*

Department of Obstetrics and Gynecology, Faculty of Medicine for Boys, Al-Azhar University, Cairo, Egypt

Abstract

Background: **Cesarean section (CS) is not standardized in the same way as other operations. When matching wound closure methods, wound problems rates, short- and long-term aesthetic outcomes are analyzed.**

Aim: **To compare cosmetic result of subcutaneous fat suture re approximation versus nonsuture closure of subcutaneous fat in females undergoing elective cesarean delivery.**

Patients and methods: **This is a prospective randomized controlled trial research, is performed on females undergoing cesarean section at El Hussein University Hospital. Study included 250 women underwent caesarean section. The patients were randomized in 2 groups using computerized randomization system.**

Results: **There is important statistical variation among 2 categories concerning closure time, POSAS, VSS scores, occurrence of complications and scar appearance.**

Conclusion: **This research shows that there is a substantial variation in amount of time required for cesarean section closure whether the subcutaneous tissue was closed verses not closed. Regarding patient satisfaction and aesthetic results, subcutaneous tissue closure was better than nonclosure. So long as it had improved cosmosis and patient satisfaction, subcutaneous tissue closure may be employed on patients having caesarean section.**

Keywords: Cesarean section, Closure, Cosmetic outcome, Subcutaneous

1. Introduction

Every year, millions of females worldwide undergo cesarean sections (CSs), which typically lead to significant skin scarring. Cosmetic result of scar is critical because it is visible stigmatization following CS. Scars can cause significant psychosocial distress, which seems to be closely linked to studied case-rated scar severity and scar location. Because of high prevalence of CS and potential long-term effects, it is critical to identify surgical methods that produces best cosmetic outcomes. Egypt has highest rate of CS in Arab world, far exceeding that of any other Arab country.[1]

There is no standard method for CS, because there is for most surgical procedures. There are numerous methods for every step of procedure, some of which have been researched. As result, surgical technique selected by operator varies greatly. When evaluating various wound closure methods, various endpoints such as wound problem rates, short-term cosmetic result, and long-term cosmetic result have been researched.[2]

Cosmetic result of subcutaneous fat closure is still worth investigating. However, there seem to be numerous reasons for advancement of hypertrophic scarring, tension acting on scar has been noted to be common initiating factor.[3]

Accepted 29 October 2022.
Available online 8 December 2023

* Corresponding author at: Department of Obstetrics and Gynecology, Faculty of Medicine for Boys, Al-Azhar University, Qaliub Specialized Hospital, Cairo, Egypt.
E-mail address: fawzy.mo7amd@gmail.com (F.M. Haggag).

https://doi.org/10.58675/2682-339X.1732

Suture closure of subcutaneous tissue, in contrast, causes inflammatory reaction against suture material, and may lead to poorer cosmesis.[4]

Even though data shows that suture closure of subcutaneous fat during CS decreases risk of wound disruption in females with subcutaneous tissue greater than 2 cm, impact of this intervention on cosmetic result has not been thoroughly researched. This could result in reluctance to implement this critical intervention on regular basis.[5]

Just few recent researches have been conducted to assess impacts of various subcutaneous tissue and skin closure techniques during caesarean section. Meta-analysis found that closing subcutaneous tissue in females with subcutaneous depth greater than two cm reduced wound dehiscence significantly.[6]

Recent studies indicate that suture closure of subcutaneous fat at time of CS has no effect on long-term cosmetic result.[7]

Goal of the work is to match cosmetic result of subcutaneous fat suture re approximation versus nonsuture closure of subcutaneous fat in females undergoing elective cesarean delivery.

2. Studied cases and methods

This was a potential randomized controlled trial research, performed on women undergoing CS at El Hussein University Hospital. All recruited women were given an informed written and signed consent to take part in research. Research period is 6 months from January 2022 to June 2022.

Ethical Committee of Department of Obstetrics and Gynecology, Faculty of Medicine, Al Azhar University, confirmed the research. Before enrolling in research and after explaining goal and procedures, all participants will be asked to provide informed written consent.

Inclusion criteria: Medically free, pregnant women between 18 and 45 years 0, BMI less than 40, elective CS and singleton pregnancy.

Exclusion criteria: Clinical signs of infection at time of CS, prior transverse suprapubic scars, and medical disorder that could interfere with wound healing, like known hypersensitivity to suture materials used in protocol, disorders needing chronic corticosteroid use or immunosuppression, and medical disorders: HELLP syndrome or pre-eclampsia, and diabetes mellitus.

Intervention: The current study included 250 women undergoing CS. The patients were randomized in two groups using computerized randomization system: group A (125 cases): patients underwent suture closure of Subcutaneous Fat on Cosmetic result After CS. Group B (125 cases): patients underwent suture nonclosure of Subcutaneous Fat on Cosmetic result After Cesarean Section.

Randomization: independent statistician organized (Random Allocation Software, Version 1.0) for sample randomization.

Allocation and concealment: 250 opaque envelopes are serially numbered, and corresponding number denoting assigned group is placed in each envelope based on randomization table. Envelopes were then sealed and placed in single box. First envelope was opened when first studied case arrived, and patient was assigned to either group 1 or group 2 based on the number inside.

All patients will be subjected to:

Each studied case signed informed consent form.

Complete history taking: Personal history, any complaint, obstetric history, menstrual history, past medical and past surgical history and family history.

Complete physical test: general test: vital signs (blood pressure, temperature, heart rate, respiratory rate) and signs of (pallor, cyanosis, jaundice, and lymph node enlargement).

When possible, prior to skin incision, all cases received single dose of intravenous cefotaxime (2000 mg) as perioperative single-shot antibiotic prophylaxis.

Subcutaneous fat is closed with 3–5 interrupted Polysorb three-zero sutures using V 26 needle in females randomized to closure group (group A). Sutures were tied till tissue re-approximated adequately, however, not as tightly as possible to prevent necrosis. The skin was sutured with proline using a straight needle subcuticular.

Subcutaneous fat is not sutured closed in females assigned to control group (group B). Participants are not aware of their group assignment.

Wound is dressed with abdominal dressing pad and adhesive tape. Dressing is removed 7 days after the operation in the first follow-up visit.

Length of surgery from skin incision to skin closure is recorded for each CS.

The wound was dressed for 7 days after the operation occurrence and place of any hematoma surrounding wound was noted. Participants are seen in follow-up after 7 days, 1, and 3 months.

Objectives of this study: Primary objective: Patient and observer POSAS summary scored seven days, one and three months after CS. Secondary objectives: After 1 and 3 months, VSS summary was scored, as was retraction of scar under level of surrounding skin, period of surgery, and advancement of hematoma, seroma, SSI, or wound disruption. Wound problems and their therapy were evaluated using self-report and chart review, with proper result adjudication.

2.1. Statistical methods

Data collected were analyzed with statistical package for social sciences, version 25.0. (SPSS Inc., Chicago, Illinois, USA). The mean and standard deviation of quantitative data were used. The frequency and percentage of qualitative data were used.

3. Results

Table 1.

There was no variation of medical importance among 2 groups regarding age, gestational age or birth weight Table 2.

There was important statistical variation among two groups concerning closure duration. Closure time is decreased in group II compared with group I Table 3.

There was no variation of medical importance among two groups regarding postoperative pain Table 4.

Table 1. Comparison between both groups regarding descriptive data.

	Group I (Subcutaneous tissue closure group) (n = 125)	Group II (Subcutaneous tissue non closure group) (n = 125)	P-Value
Age (Years)	26.3 (4.5)	25.8 (4.4)	
GA (Weeks)	38.36 (0.66)	37.27 (0.65)	
Neonatal birthweight (gr)	3582 (256)	3472 (365)	>0.05[1]
BMI	22.5 (1.7)	22.8 (1.2)	

1: t-test | 2: chi square test.
$P > 0.05$ is statistically non-important.
BMI, Basal Metabolic Index; GA, Gestational Age; gr, Grams.

Table 2. Comparing among both groups concerning Closure Time.

	Group I (Subcutaneous tissue closure group) (n = 125)	Group II (Subcutaneous tissue non closure group) (n = 125)	P-Value
Closure time (min.)	14.9 (1.67)	12.2 (1.98)	<0.05[1]

1: t-test $P < 0.05$ is important.

Table 3. Comparing among both groups concerning postoperative pain.

PostOperative pain	Group I (Subcutaneous tissue closure group) (n = 125)	Group II (Subcutaneous tissue non closure group) (n = 125)	P-Value
After 2 days	7.1 (0.79)	5.72 (0.61)	
After 7 days	3.85 (0.75)	3.89 (0.68)	>0.05[1]
After 30 days	0.69 (0.5)	0.66 (0.45)	

1: t-test $P > 0.05$ is non-important.

Table 4. Comparing among both groups concerning wound hematoma.

Wound collection	Group I (Subcutaneous tissue closure group) (n = 125)	Group II (Subcutaneous tissue non closure group) (n = 125)	P-Value
After 2 days	0	0	–
After 7 days n (%)	11 (8.8)	34 (27.2)	<0.05[a]
After 30 days	0	0	–

$P < 0.05$ is important.
[a] chi square test.

Table 5. Comparison between both groups regarding POSAS, VSS scores, scar retraction and occurrence of complications.

	Group I (Subcutaneous tissue closure group) (n = 125)	Group II (Subcutaneous tissue non closure group) (n = 125)	P-Value
POSAS score			
OSAS	19 (3)	18 (3)	>0.05[1]
PSAS	18 (2)	17 (2)	
VSS Score			
One month	6 (1)	5 (1)	
Three Months	10 (2)	9 (2)	
Scar retraction n (%)	19 (15.2)	22 (17.6)	
Complications n (%)			>0.05[2]
Itching	1 (0.8)	1 (0.8)	
SSI	0	1 (0.8)	

1: t-test | 2: chi square χ^2test.
$P > 0.05$ is nonimportant.
SSIL, Surgical Site Infection.

Table 6. Comparing among both groups concerning scar appearance.

Scar appearance	Group I (Subcutaneous tissue closure group) (n = 125)	Group II (Subcutaneous tissue non closure group) (n = 125)	P-Value
Good n (%)	25 (20)	24 (19.2)	>0.05[a]
Very good n (%)	66 (52.8)	56 (44.8)	
Excellent n (%)	31 (24.8)	28 (22.4)	
Poor n (%)	3 (2.4)	17 (13.6)	>0.05[a]

$P > 0.05$ is nonimportant.
[a] chi square χ^2test.

Table 7. Comparing among both groups concerning patient satisfaction.

Patient satisfaction	Group I (Subcutaneous tissue closure group) (n = 125)	Group II (Subcutaneous tissue non closure group) (n = 125)	P-Value
Satisfied n (%)	99 (79.2)	85 (68)	
Unsatisfied n (%)	26 (20.8)	40 (32)	<0.05[a]
Total n (%)	125 (100)	125 (100)	

$P < 0.05$ is important.
[a] chi square χ^2test.

There was important statistical variation among two groups concerning wound hematoma. After 7 days hematoma is increased in group II compared with group I Table 5.

There is no variation of medical importance among two groups regarding POSAS, VSS scores, scar retraction and occurrence of complications Table 6.

There is no variation of medical importance among two groups regarding scar appearance except for poor appearance. Poor appearance is greater in group II compared with group I Table 7.

There is important statistical variation among two groups concerning studied case satisfaction. There was significant increase in satisfaction in group I.

4. Discussion

Numerous studies have looked into impact of subcutaneous fat closure on wound problem rates, but there isn't enough information on impact of subcutaneous suture closure on wound cosmesis. Available researches produce contradictory outcomes, provide short-term cosmetic benefits, or have methodological problems Goto and colleagues.[8]

Al Hussein University Hospital hosted this prospective randomized controlled trial research. This research included 250 females who had caesarean section, patients were randomized into two: group A (125 cases): patients will undergo suture closure of Subcutaneous Fat. Group B (125 cases): patients will undergo suture nonclosure of Subcutaneous Fat.

Study found that there was no statistical variation among two groups concerning years old, gestational age, birth weight or parity.

In line with the current study Mustafa and colleagues,[9] aimed to compare surgical location infection rate and studied case satisfaction after subcutaneous tissue closure versus nonclosure of subcutaneous tissue in diabetic females undergoing caesarean section. The study enrolled 88 women randomly assigned into two groups group A (closure group): included 44 pregnant females who were undergoing elective CS with closure of subcutaneous tissue. Group B (nonclosure group): included 44 pregnant females who were undergoing elective CS without closure of subcutaneous tissue. There was no variation among two groups concerning years old, gestational years old, and parity.

As well, Esmer and colleagues,[10] aimed to investigate factors involved in wound problems and assess role of suture closure of subcutaneous tissue in avoiding wound problems after CS with Pfannenstiel incision. Research included 361 participants (176 in closure group, 185 in nonclosure group). In terms of years old, gestational years old, and parity, there was no statistical variation among two groups.

In addition, Huppelschoten and colleagues,[11] aimed to investigate impact of subcutaneous tissue closure and two different skin closure techniques during CS on long-term cosmetic outcomes. There were 218 female studied cases in research (110 in closure group, 108 in nonclosure group). There was no variation in years old or gestational years old among two groups.

In present research, we discovered no variation among two groups in terms of laboratory outcomes.

In agreement with research Esmer and colleagues,[10] described that there was no variation among two groups concerning Preoperative Hb.

In the present study we found that there is important statistical variation among two groups concerning closure time, as closure procedure take more time in comparison to nonclosure.

In agreement with results Mustafa and colleagues,[9] described that there was important variation in duration required for CS closure among closure and nonclosure of subcutaneous tissue, which was in favor of nonclosure of subcutaneous tissue.

Similarly, Esmer and colleagues,[10] reported that the closure procedure needs significantly longer operation time.

Also, research by Huppelschoten and colleagues,[11] described that operating time is shorter in no closure group.

However, research by Husslein and colleagues,[12] described that there is no difference in duration of surgery.

Research showed that there is no statistical variation among two groups concerning postoperative pain.

In agreement with results Mustafa and colleagues,[9] There was big variation in operative pain among subcutaneous tissue closure and nonclosure at 2, 7, and 30 days after surgery.

Also, in agreement with current research Huppelschoten and colleagues,[11] noted that postoperative pain and require for additional opioids were not different between two interventions.

In the present study we found that there was statistical variation among two groups concerning wound collection.

However, Mustafa and colleagues,[9] reported that there is statistically important variation among two groups as regard wound collection 7 days postoperatively. In group I (subcutaneous tissue closure) after 7 days postoperative there is 4 positive cases stated for 9.09%, while in group II (subcutaneous

tissue non closure) there was 12 positive cases stated for 27.27%, with RR: 3.10 (0.56–17.06). In this study, there were no cases of wound collection in either group 2 days postoperatively. There were no cases of wound collection in either the groups 30 days postoperatively.

We also found that there is no statistical variation among two groups concerning POSAS, VSS scores, scar retraction and occurrence of complications.

In agreement with results Husslein and colleagues,[12] described that 2 and 6 months no variations were found with respect to POSAS or VSS scores among groups.

Also, in agreement with the current results Huppelschoten and colleagues,[11] reported that there was no variations were found with respect to POSAS, PSAS and OSAS scores between groups.

Regarding scar appearance among tested groups, we found that there was no statistical variation among two groups concerning scar appearance.

Outcomes were supported by Mustafa and colleagues,[9] who described that using stony brook scar evaluation scale, there was no variation among two groups as regard scar appearance with p-value 396.

Concerning studied case satisfaction among the studied groups, we found that there was important statistical variation among two groups concerning studied case satisfaction with favor to closure group.

This come in agreement with research by Mustafa and colleagues,[9] who described that rate of patient satisfaction was higher in women of group 1 (subcutaneous tissue closure) compared with women in group 2 (subcutaneous tissue nonclosure). In group I, satisfied women were 35 (79.5%) patients and unsatisfied women were 9 (20.5%) patients. In group II, satisfied women were 30 (68.2%) patients and unsatisfied women were 14 (31.8%) patients with *P*-value 0.024. This showed statistical variation among two groups as regard studied case satisfaction.

5. Conclusion

This research found important variation among closure & non-closure of subcutaneous tissue in terms of time required for CS closure, which favored nonclosure of subcutaneous tissue. In terms of studied case satisfaction and cosmetic result, subcutaneous tissue closure outperformed nonclosure.

Authorship

All authors have a substantial contribution to the article.

Disclosure

The authors have no financial interest to declare in relation to the content of this article.

Conflict of Interest

The authors declared that there were NO conflicts of Interest.

References

1. Boerma T, Ronsmans C, Melesse DY, et al. Global epidemiology of use of and disparities in caesarean sections. *Lancet*. 2018;392:1341–1348.
2. Ryan EH, Ryan CM, Forbes NJ, et al. Primary retinal detachment outcomes study report number 2: phakic retinal detachment outcomes. *Ophthalmology*. 2020;127:1077–1085.
3. Paul SP. *Biodynamic excisional skin tension (BEST) lines for cutaneous surgery*. 2021.
4. Kara M, Kondiah PP, Marimuthu T, Choonara YE. Advances in carbohydrate-based polymers for the design of suture materials: a review. *Carbohydr Polym*. 2021:117860.
5. Pierson RC, Scott NP, Briscoe KE, Haas DM. A review of post-caesarean infectious morbidity: how to prevent and treat. *J Obstet Gynaecol*. 2018;38:591–597.
6. Hyldig N, Vinter CA, Kruse M, et al. Prophylactic incisional negative pressure wound therapy reduces the risk of surgical site infection after caesarean section in obese women: a pragmatic randomised clinical trial. *BJOG An Int J Obstet Gynaecol*. 2019;126:628–635.
7. De Graaf IM, Rengerink KO, Wiersma IC, Donker ME, Mol BW, Pajkrt E. Techniques for wound closure at caesarean section: a randomized clinical trial. *Eur J Obstet Gynecol Reprod Biol*. 2012;165:47–52.
8. Goto S, Sakamoto T, Ganeko R, Hida K, Furukawa TA, Sakai Y. Subcuticular sutures for skin closure in non-obstetric surgery. *Cochrane Database Syst Rev*. 2020;(4):CD012124. https://doi.org/10.1002/14651858.CD012124.pub2.
9. Mustafa GF, Abd El Rahman RM, Rozeik KM. Closure versus non closure of subcutaneous tissue in cesarean section in diabetic women: a randomized controlled trial. *Egypt J Hosp Med*. 2017;69:1911–1917.
10. Esmer CA, Cilesiz Goksedef P, Akca A, et al. Role of subcutaneous closure in preventing wound complications after cesarean delivery with P fannenstiel incision: a randomized clinical trial. *J Obstet Gynaecol Res*. 2014;40:728–735.
11. Huppelschoten AG, van Ginderen JC, van den Broek KC, Bouwma AE, Oosterbaan HP. Different ways of subcutaneous tissue and skin closure at cesarean section: a randomized clinical trial on the long-term cosmetic outcome. *Acta Obstet Gynecol Scand*. 2013;92:916–924.
12. Husslein H, Gutschi M, Leipold H, Herbst C, Franz M, Worda C. Suture closure versus non-closure of subcutaneous fat and cosmetic outcome after cesarean section: a randomized controlled trial. *PLoS One*. 2014;9, e114730.