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Comparative study of wound healing, pain and cosmetic results by staples versus subcuticular skin suture after caesarean delivery

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Abstract

Caesarean section is one of the most common surgical intervention in modern obstetrics. A great variety of materials and techniques are used for skin closure after caesarean section and there is a need to identify which provide the best outcomes for women.

Aims and Objectives: To compare subcutaneous versus stapling skin closure with respect to wound healing (wound infection and separation) and patient satisfaction in terms of wound cosmetic appearance and pain.

Methods: Two hundred and thirty pregnant women (undergoing LSCS without previous abdominal delivery) were included in our prospective observational study of which 115 women were in subcuticular skin closure (Monocryl 3-0) and 115 women were in staples skin closure. These patients in both the groups had similar baseline and demographic characteristics. Patients was asked about pain and evaluated for discharge, keloid formation, hatch marks (staple marks), any redness and separation of the wound edges. Patients were reviewed six weeks after the operation and their satisfaction regarding cosmetic appearance was assessed.

Results: A total of 230 patients were included in the study, of which 115 women were in subcuticular sutures group and 115 women were in staples group. The closure time was 2.02min lesser in staples closure than subcuticular closure which was significant ($p=0.0001$). The two groups were comparable regarding cosmetic outcome ($p=0.272$) (chi square=1.208) at 6 weeks postoperatively. There were no significant differences between both the groups in terms of postoperative pain ($p=0.894$) (chi square=0.018), wound healing ($p=0.361$) (chi square=3.205) and patient satisfaction ($p=0.792$) (chi square=0.070). The cost factor is slightly higher for staples closure.

Conclusion: Both the methods had comparable outcomes and choice can be left to the surgeons hands to choose staple skin closure or subcuticular skin closure according to their own personnel preference and availability.

Keywords: Caesarean section, subcuticular skin closure, staples, postoperative pain, cosmetic result, patient satisfaction

Introduction

Every year several million women have to undergo caesarean delivery, as a result they acquire an abdominal scar. Considering the number of women who undergo abdominal operations, the issue of appropriate method of wound closure is still poorly studied. An aesthetically poor scar can have a negative impact on the overall quality of life causing considerable distress, loss of self-esteem and unhappiness [1, 2]. The appearance of scar is of significant importance and is often the only reminder of surgery. Most of the operations are performed through a supra pubic low transverse skin incision. The outcome of the surgical skin closure is influenced by indication for the procedure, general medical condition of patient and associated intra-operative or post-operative complications.

The primary outcome was occurrence of wound complication (infection or separation). Secondary outcomes were components of the composite outcome, operating time, postoperative pains, cosmetic result, and patient satisfaction. Postoperative wound complication contribute a major cause of morbidity for a women and they are costly to both patient and health system. However, surgeon preferences and opinion diverge between the use of staples and subcutaneous closure of skin. The technique of closure should be quick, easy, cost effective and simple, while maximizing wound healing, cosmetic appearance, pain and patient satisfaction.

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Choosing the appropriate materials and adhering to good wound closure technique will ensure optimal wound healing [3]. The ultimate goal of any skin closure technique is to produce skin approximation and adequate healing with minimum wound complications like pain, infection, scarring and keloid formation [4]. Hence we decided to perform this study to support surgeons in making evidence based decision about the best method of skin closure after abdominal surgery and to evaluate whether the wound complications rates differ between women whose skin incision are closed with subcutaneous suture as compared with staples.

Materials and Methods

All pregnant women admitted in Department of Obstetrics and Gynecology, who were posted for elective or emergency caesarean section were included in this prospective study. Patients were assigned using computerised random sampling table for wound closure with skin sutures or skin staples and a minimum of 115 cases were studied in each group. Cases were studied from JANUARY 2019 to JUNE 2020.

Inclusion criteria

1. Patients willing to give written informed consent.
2. Age between 18-40 years.
3. BMI of 18-24kg/m².
4. Primary abdominal surgery.
5. Elective or emergency caesarean section.
6. Only Pfannenstiel Incision will be considered.

Exclusion criteria

1. Previous abdominal surgeries.
2. BMI of <18kg/m² and > 24kg/m².
3. Comorbidities like Diabetes mellitus and Anemia.
4. Alcohol or Drug abuse.
5. Chronic infection.
6. Refusal for follow up.

Method of collection of data

Considering the inclusion and exclusion criteria, all pregnant women were recruited from Department of Obstetrics and Gynecology, ESICMC & PGIMSR from JANUARY 2019 to JUNE 2020. Antenatal women were enrolled in the study who were posted for caesarean delivery.

- Informed consent was taken.
- Details were entered in the proforma regarding the detailed history of period of gestation, high risk factors, past history, complications during present and past pregnancy history, drug usage and chronic infection were taken.

- General, systemic and obstetric examination were done.
- All women were subjected to routine blood investigations and other special investigations when required.

The surgeon recorded the time taken for wound closure. Only Pfannenstiel incisions were included in the study. The subcutaneous tissue usually need not be closed if it is less than 2 cm thick [5]. Continuous subcutaneous closure was done by using 3-0/4-0 delayed-absorbable Monogactin (monocryl) sutures. The suture was placed subcutically in a running fashion. Needle was placed in the dermis 1-2 mm from the wound edge. Mirror image bites were taken horizontally for the full length of the incision. Knots at the end were buried under the skin. Care was taken to avoid tension on the suture line while dressing the wound. Staples was used for the other method. For their application the skin edges were everted and the stapler was placed on the skin surface perpendicular to the wound. It was pressed so that there was no indentation of the skin and overlapping of the skin edges. The staples were placed about 1cm apart. Staples were removed on day 7 postoperatively. The incision was measured at the end of the procedure. Dressings were identical in both the groups. Patients were reviewed six weeks after the operation and evaluated for discharge, keloid formation, hatch marks (staple marks), any redness and separation of the wound edges.

- Wound healing was examined by an independent examiner. Wound appearance was determined by 4 item ordinal scale. Wound was assigned 0 or 1 point for each for the presence or absence of the following
 1. Step of borders/wound edges (0 for yes, 1 for no)
 2. Contour irregularities- puckering (0 for yes, 1 for no)
 3. Wound margin separation (0 for yes. 1 for no)
 4. Good overall appearance (0 for poor, 1 for acceptable)
 5. Discharge from wound (0 for yes. 1 for no)

Wound with a score of 5 was considered to have an optimal cosmetic appearance, others sub optimal appearance.

- Patients were also asked about pain which is assessed on the scale of 1 to 5. A simple pain scale was used. Where 1 means no pain, 2 means mild pain, 3 means moderate pain, 4 means severe pain and 5 means very severe pain.
- Similarly patient satisfaction regarding cosmetic appearance was assessed on a scale of 1 to 5 where 1 corresponds to extremely satisfied, 2 corresponds to satisfactory, 3 corresponds to neutral, 4 corresponds to not satisfied and 5 corresponds to extremely not satisfied.



Fig 1: Subcuticular skin closed wound on the day of surgery.



Fig 2: Staple skin closed wound on the day of surgery.



Fig 3: Subcuticular skin closed wound on the day of discharge.



Fig 4: Staples skin closed wound on the day of discharge.



Fig 5: Subcuticular skin closed wound after 6 weeks.



Fig 6: Staples skin closed wound after 6 weeks.

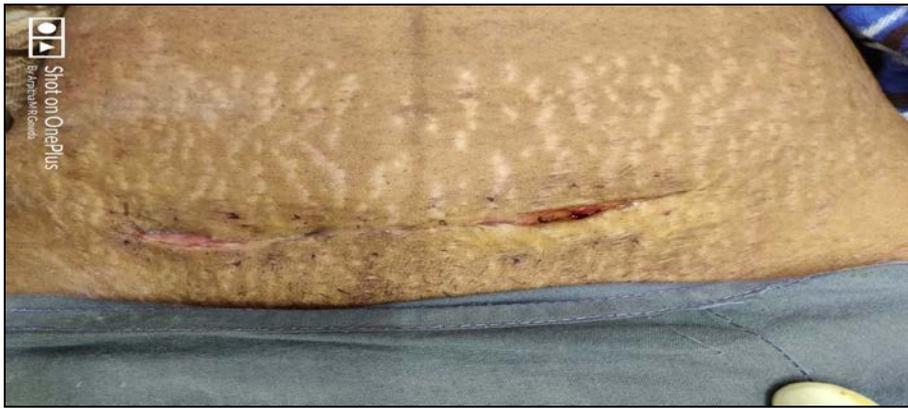


Fig 7: Staple skin closed wound with overlapping of edges.



Fig 8: Subcuticular skin closed wound with puckering of edges.

Duration of the study: Eighteen months (January 2019 to June 2020)

Type of study: A Prospective Observational Study

Sample Size

A prospective observational study of minimum 115 cases fulfilling inclusion and exclusion criteria was conducted in the department of OBG in ESIC MC PGIMSR Bangalore. For an outcome variable on wound infection with prevalence rate in cases was 10% with 4% of relative precision, 80% power, 95% confidence interval and design effect of 1, and attrition rate of 5% the sample size is estimated to be ~230.

Statistical Analysis

Data was entered into Microsoft excel data sheet and was analyzed using SPSS 22 version software. Categorical data was represented in the form of Frequencies and proportions.

Chi-square test was used as test of significance for qualitative data. Continuous data was represented as mean and standard deviation and p value was calculate using independent t test.

Graphical representation of data: MS Excel and MS word was used to obtain various types of graphs such as bar diagram, Pie diagram and line diagram.

p value (Probability that the result is true) of <0.05 was considered as statistically significant after assuming all the rules of statistical tests.

Statistical software: MS Excel, SPSS version 22 (IBM SPSS Statistics, Somers NY, USA) was used to analyze data.

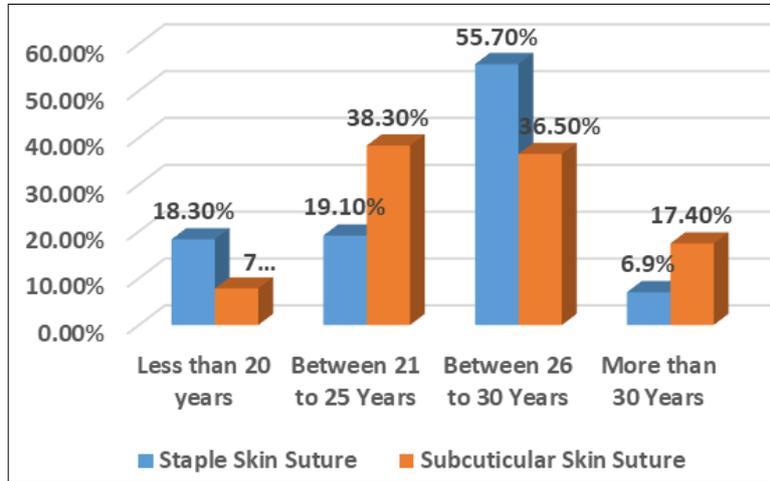
Results

In the current prospective observational study conducted from January 2019 to June 2020, a total of 230 patients were included. Of which 115 women were in subcuticular sutures group and 115 women were in staples group. These patients in both the groups had similar baseline and demographic characteristics. The patients were between 18 to 40 years of age.

Table 1: Comparison of Age group of study subjects in both the groups

		Procedure			
		Staple Skin Suture		Subcuticular Skin Suture	
		Frequency	%	Frequency	%
Age	Less than 20 years	21	18.3%	9	7.8%
	Between 21 & 25 Years	22	19.1%	44	38.3%
	Between 26 & 30 Years	64	55.7%	42	36.5%
	More than 30 Years	8	6.9%	20	17.4%

Chi Square = 21.842 p=0.0001



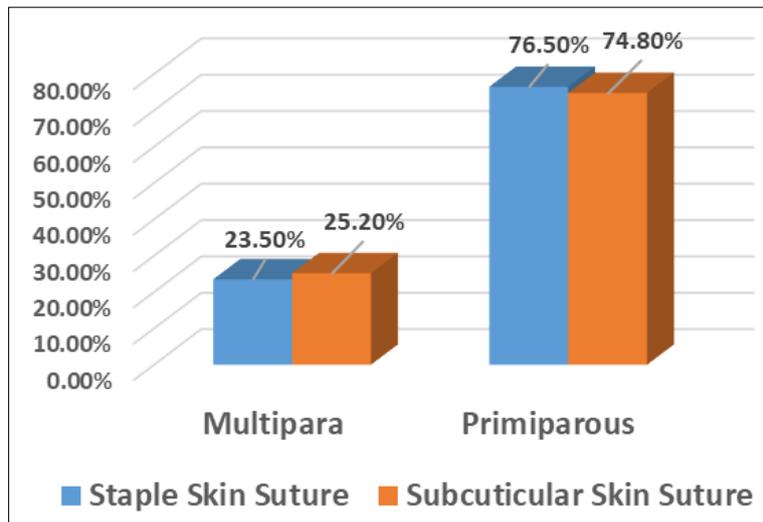
Graph 1: Age Group

In the present study, 18.3% (n=21) and 7.8% (n=9) women belongs to <20yrs, 19.1% (n=22) and 38.3% (n=44) women belongs to 21-25yrs, 55.7% (n=64) and 36.5% (n=42) women belongs to 26-30yrs, 6.9% (n=8) and 17.4% (n=20) women belongs to >30yrs respectively to the staples and subcuticular study group.

Table 2: Comparison of Parity of study subjects in both the groups

		Procedure			
		Staple Skin Suture		Subcuticular Skin Suture	
		Frequency	%	Frequency	%
Parity	Multigravida	27	23.5%	29	25.2%
	Primigravida	88	76.5%	86	74.8%

Chi Square=0.094 p=0.759



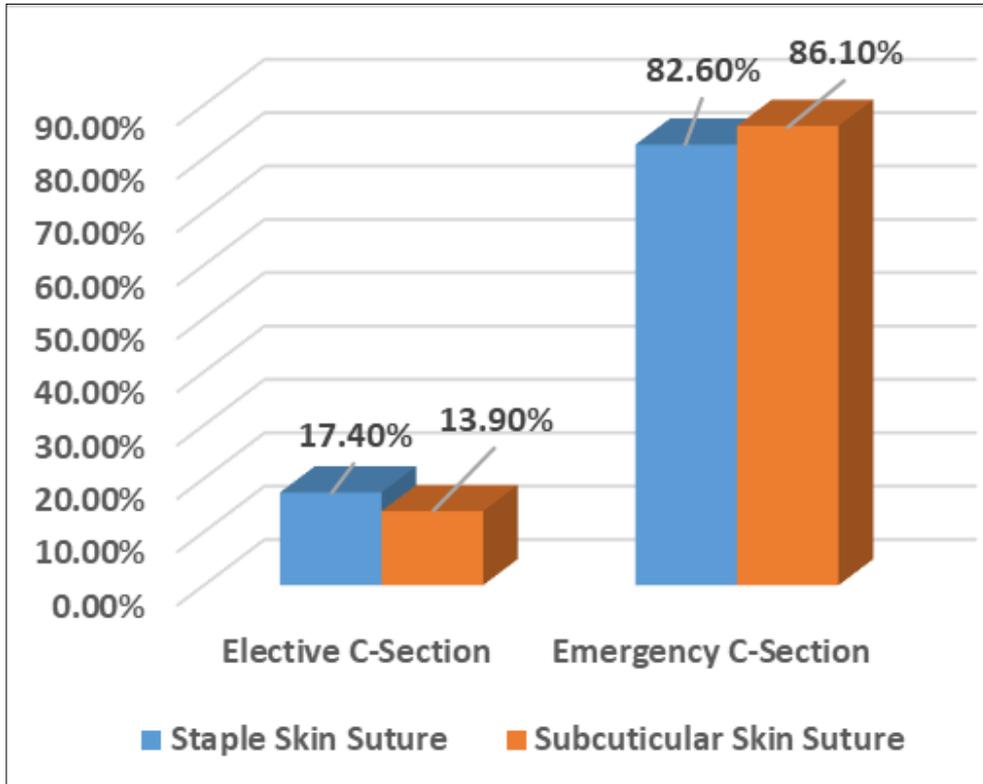
Graph 2: Parity

In the present study, the multigravida were 23.5% (n=27) and 25.2% (n=29) and primigravida were 76.5% (n=88) and 74.8% (n=86) respectively among staples and subcuticular study group and there were no significant differences with respect to parity (p=0.759).

Table 3: Comparison of Surgery type among both the study groups

		PROCEDURE			
		Staple Skin Suture		Subcuticular Skin Suture	
		Frequency	%	Frequency	%
Type of Surgery	Elective C-Section	20	17.4%	16	13.9%
	Emergency C-Section	95	82.6%	99	86.1%

Chi Square= 0.527 p=0.468



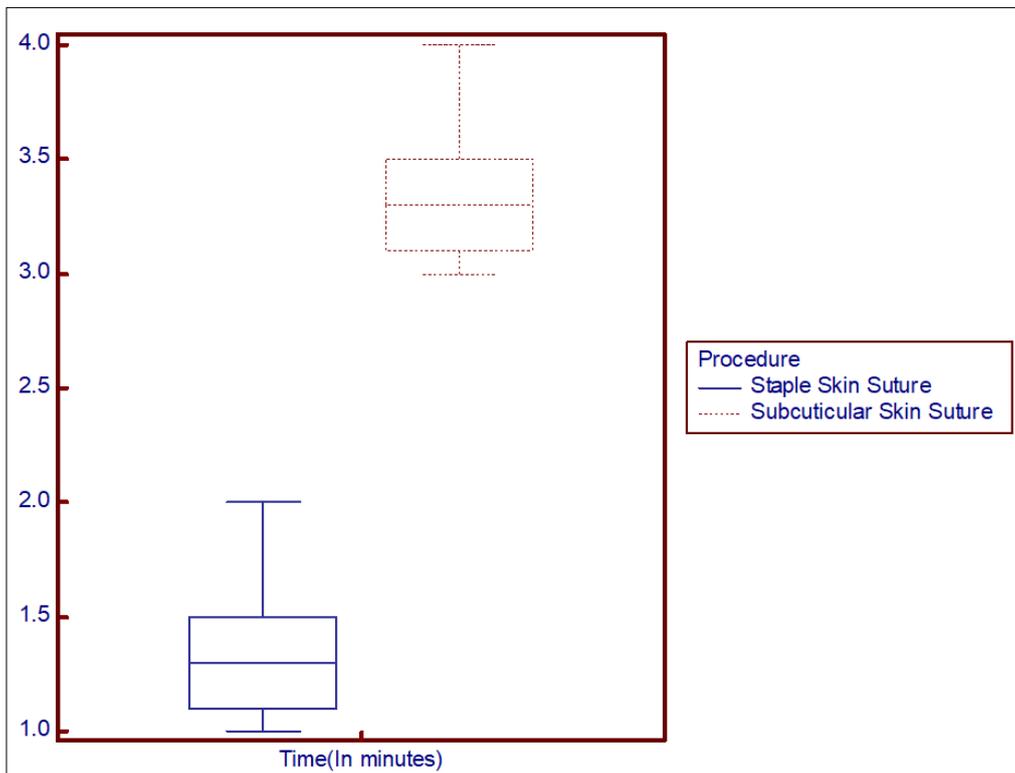
Graph 3: Type of Surgery

In the present study, 17.4% (n=20) and 13.9% (n=16) were Elective C-Section and 82.6% (n=95) and 86.1% (n=99) were Emergency C-Section among the staples and subcuticular study group respectively and there were no significant differences between two groups with respect to type of surgery (p=0.468).

Table 4: Comparison of Mean time taken for the procedure in both the groups

	Procedure			
	Staple Skin Suture		Subcuticular Skin Suture	
	Mean	Standard Deviation	Mean	Standard Deviation
Time (In minutes)	1.40	0.35	3.42	0.36

Unpaired t test=45.79 p=0.0001



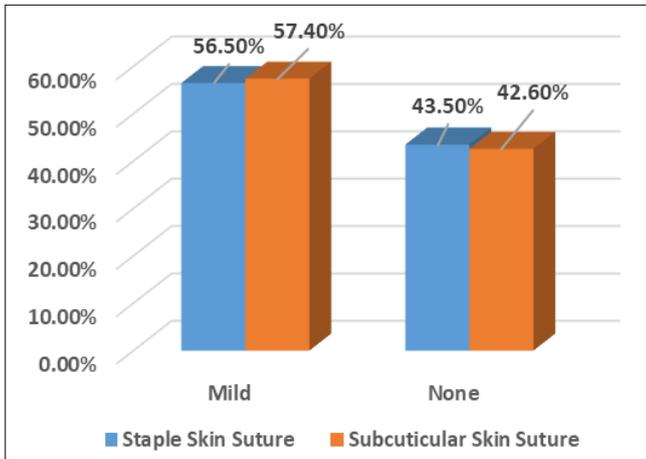
Graph 4: Comparison of Mean time taken for the procedure in both the groups

In the present study, Mean time of closure was 3.42minutes for the subcuticular group as compared to the 1.40 minutes for the staple group and there was significant different between the two groups (p=0.0001).

Table 5: Comparison of Grade of Pain among study subjects in both the groups

		Procedure			
		Staple Skin Suture		Subcuticular Skin Suture	
		Frequency	%	Frequency	%
Grade of pain	Mild	65	56.5%	66	57.4%
	None	50	43.5%	49	42.6%

Chi Square =0.018 p=0.894



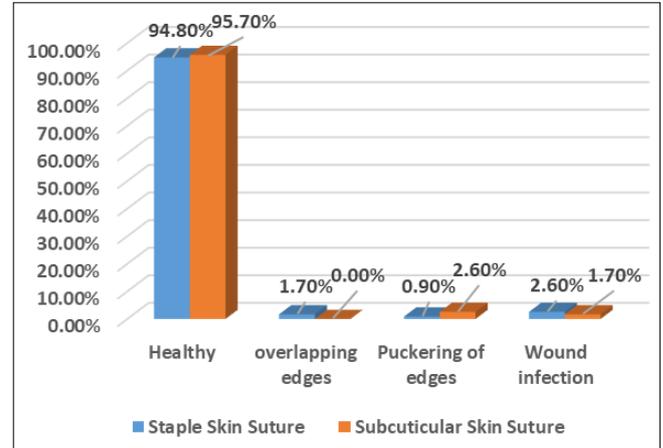
Graph 5: Grade of pain

In the present study, mild pain was noted in 56.5% (n=65) and 57.4% (n=66) and no pain in 43.5% (n=50) and 42.6% (n=49) among staples and subcuticular study group respectively and there were no significant differences between two groups with respect to grade of pain (p=0.894).

Table 6: Comparison of Wound healing among study subjects in both the groups

		Procedure			
		Staple Skin Suture		Subcuticular Skin Suture	
		Frequency	%	Frequency	%
Wound healing	Healthy	109	94.8%	110	95.7%
	overlapping edges	2	1.7%	0	0.0%
	Puckering of edges	1	0.9%	3	2.6%
	Wound infection	3	2.6%	2	1.7%

Chi Square =3.205 p=0.361

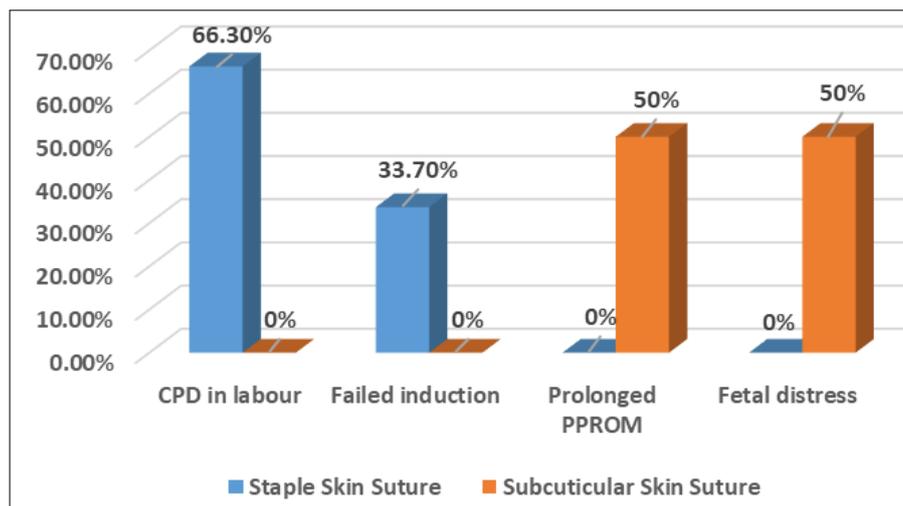


Graph 6: Wound Healing

In the present study, wound healing between the two groups was not found to be significant (p=0.361). However overlapping of edges was more with staples (1.7%) than subcuticular (no case), while puckering of edges was found to be more with subcuticular (2.6%) than staples (0.9%) skin suturing. Wound infection was 2.6% and 1.7% seen in staples and subcuticular skin suturing respectively which was not significant.

Table 7: Comparison of Indication among study subjects with Wound infection in both the groups

		Procedure			
		Staple Skin Suture		Subcuticular Skin Suture	
		Frequency	%	Frequency	%
Indication among subjects with Wound Infection	CPD in labour	2	66.3%	0	0%
	Failed induction	1	33.7%	0	0%
	Prolonged PPRM	0	0%	1	50%
	Fetal distress	0	0%	1	50%



Graph 7: Indication among wound infection

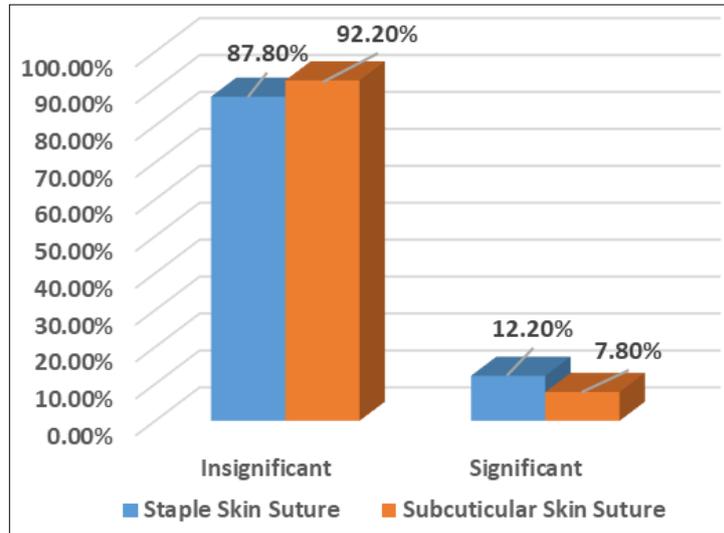
In the present study, staples closure had 3 cases of infection out of which 66.3% (n=2) was for CPD in labour and 33.7% (n=1) was for Failed induction. Similarly subcuticular closure had 2 cases of infection out of which 50% (n=1) was for Prolonged

PPROM and 50% (n=1) was for Fetal distress. The infection rate of the wound was less in both the study groups which was irrespective of the indication for caesarean section.

Table 8: Comparison of Cosmetic appearance of scar among study subjects in both the groups

		Procedure			
		Staple Skin Suture		Subcuticular Skin Suture	
		Frequency	%	Frequency	%
Cosmetic appearance	Insignificant	101	87.8%	106	92.2%
	Significant	14	12.2%	9	7.8%

Chi Square = 1.208 p=0.272



Graph 8: Cosmetic appearance

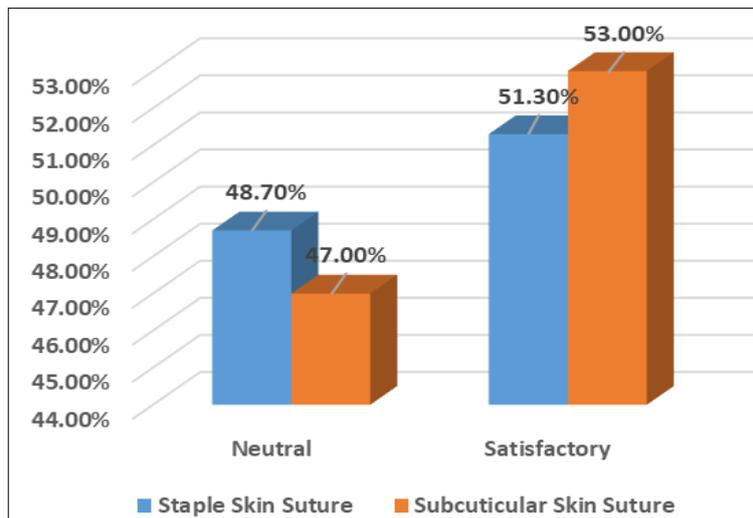
In the present study, Cosmetic appearance of the scar was taken as significant when the scar thickness was more than 1mm and 12.2% (n=14) and 7.8% (n=9) was significant and 87.8% (n=101) and 92.2% (n=106) was insignificant among staples

closure and subcuticular closure. There were no significant differences between two groups with respect to cosmetic appearance of scar(p=0.272).

Table 9: Comparison of Patient Satisfaction among study subjects in both the groups

		Procedure			
		Staple Skin Suture		Subcuticular Skin Suture	
		Frequency	%	Frequency	%
Patient satisfaction	Neutral	56	48.7%	54	47.0%
	Satisfactory	59	51.3%	61	53.0%

Chi Square = 0.070 p=0.792



Graph 9: Patient Satisfaction

In the present study, patient satisfaction was noted in 51.3% and 53% of the participants while 48.7% and 47% expressed neutral opinion among staples and subcuticular study group respectively. The patient satisfaction between the two groups was found to be almost equal and it was not significant ($p=0.792$).

Discussion

Considering the number of women who undergo operations for obstetrical indications around the world each year, the issue of appropriate method of wound closure is still controversial (no single method is universally accepted). An expert guideline on CS published in 2004 by the National Institute for Health and Clinical Excellence (NICE) concluded that further RCTs are needed to determine the best closure technique at CS [6]. This guideline is currently being updated. However, the recent publication of multiple prospective trials on this topic makes a reanalysis of the evidence timely. Prior to the initiation of our study, few studies had objectively evaluated the potential impact

of caesarean skin closure technique and materials on wound disruption or infection but focused primarily on pain or cosmesis [7]. Postoperative wound complications for women undergoing caesarean delivery constitute a major cause of morbidity and they are costly to both the patient and health system [8].

Table 10: Age

Mean Age (yrs)	Staple closure	Subcuticular closure
In Present study	25.81	25.97
Basha <i>et al.</i> , [9]	28.9	29.0
Rousseau <i>et al.</i> , [10]	30.7	30.6
Cromi <i>et al.</i> , [11]	32.5	33.3

In present study, the mean age of staples closure and subcuticular closure were 25.81yrs and 25.97yrs respectively and there were no significant differences between two groups with respect to maternal age ($p=0.76$) which is comparable to Rousseau *et al.*, Cromi *et al.* and Basha *et al.* studies.

Table 11: BMI

	Mean BMI in Staple closure (kg/m ²)	Mean BMI in Subcuticular closure (kg/m ²)
Present study	21.67	21.72
C Sharma <i>et al.</i> , [12]	25.7 ± 0.9	26.1 ± 0.8
Basha <i>et al.</i> , [9]	28.6	29.0
Rousseau <i>et al.</i> , [10]	27.8	27.2

In our study, the mean BMI of staples and subcuticular study group were 21.67 and 21.72 respectively, which has no significant difference in our present study ($p=0.79$) which is comparable C Sharma *et al.*, Basha *et al.* and Rousseau *et al.* studies.

Obesity as got the direct effect on wound complication rates. Most recently, a meta-analysis of 3112 patients by Mackeen *et al.*, [14] showed that obese women were 49% less likely to have a wound complication if their incision was closed by suture as compared with staples.

There were various indications for caesarean section among both the groups but the choice of staples or subcuticular skin closure was irrespective the indication of caesarean section.

In the present study, 17.4% (n=20) and 13.9% (n=16) were Elective C-Section and 82.6% (n=95) and 86.1% (n=99) were Emergency C-Section among the staples and subcuticular study group respectively and there were no significant differences between two groups with respect to type of surgery ($p=0.468$).

In the C Sharma *et al.* [12]. study Staples are the method of choice for skin closure in emergency CS as they are significantly better than subcuticular sutures with respect to cosmesis and duration of surgery. In contradiction to above study, Rousseau *et al.*, [10] study concluded that Staples are the method of choice for skin closure for elective term cesareans in our population.

Table 12: Fat closure

Criteria for Subcutaneous fat closure	
In Present study	If >2cm
Cromi <i>et al.</i> , [11]	If >2cm
Basha <i>et al.</i> , [9]	If >2cm
Figueroa <i>et al.</i> , [13]	If >2cm

In the present study, the fat closure was done in 43.5% (n=50) of staples closure and 48.7% (n=56) of subcuticular closure who had depth of subcuticular space >2cm. Similarly the fat closure was not done in 56.5% (n=65) of staples closure and 51.3%

(n=59) of subcuticular closure who had depth of subcuticular space <2cm. There were no significant differences between two groups with respect to fat closure ($p=0.427$) and method of fat closure which is comparable to Cromi *et al.*, Basha *et al.* and Figueroa *et al.* studies. So the fat closure will minimise the wound infection rates. In regard to subcutaneous thickness, if depth is <2 cm, there is no difference in wound disruption between closure and non-closure [15]. In women with subcutaneous thickness >2 cm, closure was associated with a significant decrease in wound complications (RR: 0.66; 95% CI: 0.48–0.91) and is recommended [15].

In Feb 2017, V Pergialiotis *et al.* [16] conducted a study on closure of subcutaneous fat in CS and concluded that re-approximation of the subcutaneous tissue significantly reduced the odds of developing any type of wound complication (95% CI 0.47–0.93).

In 2004, Anderson and Gates [17] performed the latest meta-analysis concerning the impact of subcutaneous tissue closure on wound complication rates following CS and concluded that the risk of wound haematoma, seroma or any complication was reduced when subcutaneous tissue closure was done.

Table 13: Skin closure time

Mean reduction in closure time	
In present study	2.02 min
M Kalim <i>et al.</i> , [3]	2.48 min
Figueroa <i>et al.</i> , [13]	4 min
C Sharma <i>et al.</i> , [12]	8 min
Clay FS <i>et al.</i> , [7]	5.05 min

It is evident from our study that staples are quick to apply and from the surgeon's point of view it is easy, quick and safe method as it also decreases the risk of needle stick injuries. On the overall view it decreases theatre time in staples group than subcuticular group. Mean time of closure was 3.42minutes for the subcuticular group as compared to the 1.40 minutes for the

staple group. This study demonstrates that staples can be applied at a much faster rate than the subcuticular stitches ($p=0.0001$). The statistically significant difference of the decrease in the operating time seem to be of so much significant clinically especially in emergency surgery as it forms part of the overall surgical time and Concerned to the time factor, present study is comparable to Figueroa *et al.*, C Sharma *et al.*, Clay FS *et al.* and M Kalim *et al.* studies. Also in a meta-analysis of Wang H *et al.*, indicated that the total operation time was significantly shortened in staples group compared to sutures group (MD -8.66 min, 95% CI -10.90 to -6.42, $p < 0.001$).

Postoperative pain assessment

Assessment of pain depends on simple factors like overwork and social stresses which can make considerable difference and the magnitude, the management of pain are also important. In the present study, mild pain was noted in 56.5% ($n=65$) and 57.4% ($n=66$) and no pain in 43.5% ($n=50$) and 42.6% ($n=49$) among staples and subcuticular study group respectively and there were no significant differences between two groups with respect to grade of pain ($p=0.894$), which is comparable to C Sharma *et al.*,^[12] ($p=0.149$) and M Kalim *et al.*,^[3] ($p=0.80$) studies.

In a similar study by Frishman *et al.*,^[18] found that patients had significantly more pain in the staple closure group than subcuticular closure group which is contradictory to our study.

In a study Rousseau *et al.*,^[10] no significant difference in the appearance of the wound was found but pain was significantly less in the staple group. The scientific explanation of this is not clear. The results of this study contradict the results of study conducted by M Kalim *et al.*,^[3] Frishman *et al.*,^[18] and our present study.

Wound healing assessment

In the present study, wound healing between the two groups was not found to be significant ($p=0.361$). However overlapping of edges was more with staples (1.7%) than subcuticular (no case), while puckering of edges was found to be more with subcuticular (2.6%) than staples (0.9%) skin suturing. Wound infection was 2.6% and 1.7% seen in staples and subcuticular skin suturing respectively which is not significant which is comparable to Frishman GN *et al.*,^[18] Gaertner, I *et al.*,^[19] Rousseau J A.,^[10] Cromi, A., *et al.*,^[11] Sharma C *et al.*,^[12] studies whereas Figueroa D *et al.*,^[13] Mackeen AD *et al.*,^[20] Basha S L *et al.*,^[9] suggested that closure with staples could increase postoperative wound complications.

The staples closure had 3 cases of infection out of which 66.3% ($n=2$) was for CPD in labour and 33.7% ($n=1$) was for Failed induction. Similarly subcuticular closure had 2 cases of infection out of which 50% ($n=1$) was for Prolonged PPRM and 50% ($n=1$) was for Fetal distress. The infection rate of the wound were comparable in both the study groups which was irrespective of the indication for caesarean section.

Cosmesis assessment

In the present study, Cosmetic appearance of the scar was taken as significant when the scar thickness was more than 1mm and 12.2% ($n=14$) and 7.8% ($n=9$) was significant and 87.8% ($n=101$) and 92.2% ($n=106$) was insignificant among staples closure and subcuticular closure. There were no significant differences between two groups with respect to cosmetic appearance of scar ($p=0.272$), which is comparable to M Kalim *et al.*,³ Cromi *et al.*,¹¹ Rousseau *et al.*,¹⁰ MN Zaki *et al.*,²¹ and Gaertner *et al.*,¹⁹ studies.

According to C Sharma *et al.*,¹¹ study Staples are the method of

choice for skin closure in emergency CS as they are significantly better than subcuticular sutures with respect to cosmesis and duration of surgery.

In the present study, Mean scar length was 16.06cm for the subcuticular group as compared to the 14.96 for the staple group. This study demonstrates that staples scar length is shorter than the subcuticular stitches ($p=0.0001$). According to M Kalim *et al.*,³ study ($p=0.36$), there were no statistical difference in the length of the scar. However the length of the scar depends on the incision at the time of the surgery.

Patient satisfaction assessment

One of the important and essential aspects of the patient satisfaction are cosmetic appearance and pain. The result of this study shows there was no clinically and statistically significant difference in the two methods of wound closure with regards to patient satisfaction. Patient satisfaction includes both the cosmetic (aesthetic) appearance of the scar and the degree of pain.

In the present study, patient satisfaction was noted in 51.3% and 53% of the participants while 48.7% and 47% expressed neutral opinion among staples and subcuticular study group respectively. The patient satisfaction between the two groups was found to be almost equal and it was not significant ($p=0.792$) which is comparable to M Kalim *et al.*,³ Cromi *et al.*,¹¹ and MN Zaki *et al.*,^[21] studies.

But the cost of the procedure in staples group are slightly higher in staples group. The best time to remove the staples is at 7th Post-operative day, but in subcuticular group there was no need of suture removal other than routine dressing. According to available literature the inflammatory process continues beyond the seven days. This is very important point to note as the skin seems intact within days after the injury, but the tissues underneath are still vulnerable to damage and may not be strong enough to withstand daily tensile forces. There were no differences between two groups in terms of the duration of hospital stay, wound healing and cosmetic outcome. Follow up was done after 6weeks in both the groups.

Conclusion

Caesarean section is one of the important procedure which is routinely done in obstetrics. It is surgeon's choice to choose the method of skin closure i.e staples or subcuticular suture, according to their own personnel preference and availability of the suture material at that time. Though the cost factor is slightly higher with staples skin closure, they are easy, quick and safe method as it also decreases the risk of needle stick injuries. Hence both the methods of skin closure seem to be a reasonable choice in caesarean section because they have comparable post-operative pain, wound healing, cosmetic appearance and patients satisfaction except for the closure time, which is less in staples closure than subcuticular closure.

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