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Research Article

**COMPARISON OF WOUND INFECTION IN SKIN STAPLES  
VERSUS SUTURES FOR SKIN CLOSURE IN CAESAREAN  
SECTION**Dr Kashmala Shafique<sup>1</sup>, Dr Summiaya Ehsan<sup>1</sup>, Dr Warda Azam<sup>1</sup><sup>1</sup>Rawalpindi Medical University**Article Received:** August 2020    **Accepted:** September 2020    **Published:** October 2020**Abstract:**

**Introduction:** Surgical wound closure aims to move close the skin flaps to favor rapid healing and a good cosmetic outcome with low risk of complications. **Aims and objectives:** The basic aim of the study is to compare the wound Infection in Skin Staples versus Sutures for Skin Closure in Caesarean Section. **Material and methods:** This comparative study was conducted in Rawalpindi medical university during June 2019 to January 2020. The data was collected from pregnant female population. The data was collected and compare for the wound Infection in Skin Staples versus Sutures for Skin Closure in Caesarean Section. Eligible women were approached and consented at the time of admission for delivery. **Results:** The data was collected from 398 patients. Four women randomized to the suture group actually received staples but they were analyzed in the suture group according to the intent to treat principle. The baseline characteristics of the randomized cohort including BMI ( $\approx 36$  kg/m<sup>2</sup>), race/ethnicity (predominantly African American) and prior cesarean (47-49%) were similar between study groups. **Conclusion:** It is concluded that our results support the use of suture over staples among women undergoing cesarean delivery, particularly after a horizontal skin incision.

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**INTRODUCTION:**

Surgical wound closure aims to move close the skin flaps to favor rapid healing and a good cosmetic outcome with low risk of complications. Infection of surgical wound is a relevant complication with an incidence of 1% to 3%; it is favored by age, underlying illness (American Society of Anesthesiologists score of three or more, diabetes, malnutrition, low serum albumin, radiotherapy, and steroid use), obesity, host immune status, smoking, site, level of wound contamination. Further significant risk factors are related to type and complexity of the surgical procedure, duration of operation, type of surgical approach (laparotomic or laparoscopic or robotic) [1].

Wound dehiscence is another complication of surgical procedures that may increase the inpatient stay, resulting in additional costs, and it has a 9.6% attributable mortality [2]. Further surgical wound complications are the formation of hypertrophic or keloid scarring. The cosmetic appearance of the scar after healing is a relevant outcome, which affects the satisfaction of patients. A meticulous surgical technique is needed to avoid local swelling, dehiscence of the wound, and a poor cosmetic result. Different methods and materials are used for wound closure and they are highly dependent on the type of surgery, the length and anatomical site of the wound [3].

Skin closure of surgical wounds is usually achieved with sutures. Sutures can be continuous or interrupted and the material used can be natural or synthetic, absorbable or non-absorbable, single filament or braided, depending on the length and anatomic location of the wound. The principal advantages of sutures are their flexibility, strength, non-toxicity, and in vivo degradation properties [4]. Staples are a valid alternative to sutures and are mainly made of stainless steel, although staples using absorbable materials are now available. The skin is typically closed with surgical staples or sutures after cesarean delivery. Until recently there has been little evidence regarding the best cesarean skin closure material. It has been postulated that sutures act as a foreign body and damage tissue leading to increased infections. Initial small studies regarding cesarean skin closure materials examined operative time, pain scores, cosmesis scores and/or patient satisfaction and yielded contradictory findings [5].

**Aims and objectives**

The basic aim of the study is to compare the wound Infection in Skin Staples versus Sutures for Skin Closure in Caesarean Section.

**MATERIAL AND METHODS:**

This comparative study was conducted in Rawalpindi medical university during June 2019 to January 2020. The data was collected from pregnant female population. The data was collected and compare for the wound Infection in Skin Staples versus Sutures for Skin Closure in Caesarean Section. Eligible women were approached and consented at the time of admission for delivery. Those who required cesarean delivery underwent usual perioperative management (surgical skin preparation with povidone iodine solution and prophylactic antibiotics). Women were randomized to either surgical metallic staples (Ethicon Endosurgery Promixate PlusMD skin stapler) or absorbable sutures according to a predetermined computer-generated block randomization scheme prepared by a study statistician. Sequentially numbered and sealed opaque envelopes were prepared according to the randomization scheme and were delivered to a secure container in the operating room suite in order to maintain concealed treatment allocation. A standardized physical examination of the wound was performed by trained obstetric providers.

Quantitative measures were analyzed using the two-tailed unpaired Student t-test and the Wilcoxon rank sum test. Statistical significance was defined as  $P \leq 0.05$  without adjustments for multiple comparisons.

**RESULTS:**

The data was collected from 398 patients. Four women randomized to the suture group actually received staples but they were analyzed in the suture group according to the intent to treat principle. The baseline characteristics of the randomized cohort including BMI ( $\approx 36$  kg/m<sup>2</sup>), race/ethnicity (predominantly African American) and prior cesarean (47-49%) were similar between study groups. Of the 350 (88%) who had post-operative follow-up at 4-6 weeks, 179 were in the staple and 171 in the suture group. Baseline characteristics remained similarly. Stratified analyses of the cumulative primary outcome at 4-6 weeks by selected baseline variables revealed that the primary composite outcome was generally more frequent with staple closure regardless of sub-group including women with BMI <30 and BMI  $\geq 30$  as well as presence or absence of prior cesarean, labor or attempted induction, and chorioamnionitis.

Table 01: Cumulative Incidence of the Primary Composite Outcome and Its Components

	Staples (%)	Suture (%)	Relative Risk (95% CI)
At hospital discharge	n=198	n=200	
Composite outcome	15 (7.1)	1 (0.5)	14.1 (1.8-108)
Infection*	1 (0)	1 (0.5)	
Disruption*	15 (7.1)	1 (0.5)	14.1 (1.8-107)
At 4-6 weeks	n=175	n=171	
Composite outcome	23 (14.5)	10 (5.9)	2.4 (1.2-5.0)
Infection*	6 (2.2)	6 (3.5)	0.7 (0.2-3.3)
Disruption*	25 (13.4)	6 (3.5)	3.9 (1.6-10.1)

The evidence was insufficient to determine whether there was a difference between the two interventions in terms of rates of severe wound infection.

### DISCUSSION:

Concerning the length of stay, the evidence was insufficient to determine whether there was a difference between two techniques. Compared to staples, sutures probably slightly reduce the risk of readmission (0.5% vs 1.7%, but the quality of evidence was low. The employment of staples for wound closure may increase the risk of adverse events compared to the use of sutures (7.3% for staples vs 3.5% for sutures), but the certainty of evidence was low. Furthermore, patients with sutures were more likely to be satisfied with the cosmetic results of their surgery (63.7%) than patients with staples (60.5%) but we found no evidence of difference between the interventions and the quality of evidence was low [6].

Moreover, post-operative pain could be slightly less with sutures than staples, but the heterogeneity resulted very high and the evidence was downgraded due to imprecision (large confidence interval). All included studies were randomized trials and the evidence was rated as low or very low quality. The main reason for downgrading was that at least 60% of the studies were with unclear or high risk allocation concealment and only 30% of the trials clearly reported the blinding of the outcome assessor [7].

Given that patients and personnel could not be blinded, it was not possible to avoid performance bias and we took in consideration only the presence of detection bias for our judgement. Hence, for almost all outcomes we downgraded for risk of bias due to the presence of selection bias and detection bias. A further downgrading was performed due to imprecision for all the assessed outcomes. In addition, for post-operative pain and readmission rates, unexplained heterogeneity was found and this caused a further downgrading of the evidence. There was no evidence of publication bias based on examination of a funnel plot [5,6].

### CONCLUSION:

It is concluded that our results support the use of suture over staples among women undergoing cesarean delivery, particularly after a horizontal skin incision. Furthermore, we estimate that the price of a stapler (not even including a staple removal kit) is at least 2.5 times the price of the absorbable suture.

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