DOI: https://doi.org/10.53350/pjmhs22165594

ORIGINAL ARTICLE

Comparison Between Skin Staples and Prolene Sutures for Skin Closure in Caesarean Section Patients

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ABSTRACT

Objective: To compare the frequency of wound infection in skin staples versus prolene sutures for skin closure in patients undergoing caesarean section.

Subject and Methods: This study comprises 216 patients that underwent caesarean mode of delivery, which were further divided into 2 groups on the basis skin closure. In Group I skin closure was done with staples and in Group II skin was closed with prolene sutures. Type of C section (elective or emergency) was recorded. Mean and standard deviation was calculated for age, gestational age and skin closure time. Wound infection was recorded based on the presence of any of the following, purulent drainage, cellulitis, abscess or wound demanding debridement and drainage.

Results: The mean age of patient in group I was 28.53±4.27 and in Group II was 29.17±4.29. Skin closure time for staples group was recorded as 2.01.±1.01 minutes and for suture group it was 6.46.±2.19 minutes. In skin staples group 19(17.6%) patients developed wound infection and in sutures group 08(7.40%) females got wound infection within 7th post-operative day.

Conclusion: Wound infection is less likely to occur in patients of suture group as compared to staples group

Keywords: Cesarean Delivery, Skin Closure, Suture, Prolene, Staples.

INTRODUCTION

The Caesarean section is the most frequent kind of surgery done all over the globe. As a result, the proportion of persons undergoing this treatment is on the rise, as is the number of patients undergoing subsequent caesarean sections.[1] Approximately 33% of pregnant women in the United States and 15% internationally have their babies through caesarean section, and the percentage is rising.[2] The prevalence ranges from 3% to 21% in various parts of the globe.[3] In a little more than a century, the function of caesarean section has evolved from a desperate treatment used only in the most dire of situations to a common place operation used regularly, particularly in rich cultures, for what some would consider insignificant causes.[4]

When compared to women who give birth vaginally, women who give birth via caesarean section have a 5 to 20 times higher risk of peri-partum infective problems.[5] Infections at the surgical area have been documented to develop in up to 12% of surgeries.[6] Furthermore, wound consequences such as haematoma, seroma, and dehiscence may make recovering after a caesarean section more difficult, all of which can have a detrimental influence on postnatal maternal health and welfare, a woman's capacity to care for her kid, and her entire postnatal perspective.[7] After a caesarean operation, wound infection is a typical consequence. The suture substance used for skin closure, as well as the closure of the subcutaneous fascia, may all influence the likelihood of infection.[8]

In a caesarean section, two types of incisions are used: a low midline incision and a Pfannenstiel incision.[9] Which incision to use is mostly determined by the surgeon's choices and expertise, as well as the surgery's justification.

A number of skin closure methods, such as interrupted suture, subcuticular suture, or even skin staples, may be employed to close a low midline incision.

One of the most critical determinants of surgical outcome is skin closure. Physicians have been looking for the perfect stitch substance for over 50000 years. The skin serves as a protecting and self-healing covering between the body and the outside surroundings. Every surgeon wants to witness a wound that is healthier and has a nicer looking scar. The closing technique should be simple, rapid, and cost-effective.[10]

Various suturing materials, as well as skin staples (SS), are used to seal the skin after a C-section (CS). A handful of these suturing solutions have been linked to cost-effectiveness, reduced wound contamination occurrences, improved aesthetic advantages, and less pain. The suture components used may have an impact on the ultimate outlook of the wound in respect of time needed for skin closing, length of hospital admission, wound infection, discomfort during suture withdrawal, and scar aesthetic result.[11] Skin staples are easier to use and have been linked to a 3- to 4-fold reduction in skin closure time and less wound infections. SS is said to be more painful, leading in a lesser aesthetic outcome, although being considerably more expensive than suturing solutions.[12]

The goal of this research was to determine the time it took to close the skin and the incidence of wound infection in c-section patients who used skin staples or prolene suture material.

MATERIAL AND METHODS

This prospective comparative was performed at Obstetrics and Gynecology department of Abbasi Shaheed Hospital at Karachi Medical and Dental College, Karachi from February 2021 to January 2022. A total of 216 patients that underwent c section mode of delivery took part in the study. These patients were further divided into 2 groups as mentioned below:

Group I: 108 patients in which skin was closed with skin staples

Group II: 108 patients in which skin was closed with silk sutures.

Data Collection Procedure: The study was performed after prior permission from hospital's ethical review board. The admitted patients in the Obs and Gynae ward, who went for elective or emergency cesarean section having age range in between 18 to 40 years, gestational age ≥36 weeks and agreed to participate, were included in the study. Patients with immunocompromised state, any history of previous wound infection and obese woman having BMI more than 30 were excluded from study.

The Caesarean section was conducted pursuant to departmental norms, and the skin sealing was done randomly. Skin was stretched with vertical mattress sutures using non-absorbable prolene 2-0 at a spacing of one cm between them in the suture group. Skin staplers were employed to seal wounds at a distance of 5 mm from one another in the skin stapler group.

Patients of both groups got the same antibiotic treatment for the same amount of time. In both groups, the average time it took to close the skin was noted. Staples and sutures were removed on the seventh day after surgery. Purulent drainage, cellulitis,

abscess, or wound requiring debridement and drainage were all reported as signs of wound infection.

The data was analysed using SPSS version 20.0. For quantitative characteristics such as age, gestational age of the patients, and skin closure time, mean and standard deviations were used. In all groups, frequency and percentage estimates were done for every qualitative variable, including wound infection.

RESULTS

In this study mean age of patient in staples group was 28.53±4.27 and in suture group it was 29.17±4.29. Mean age of patient in both groups was statistically same. Gestational age recorded was 38.29±0.46 and 38.33±0.48 for group I and II respectively. Skin closure time for staples group was recorded as 2.01.±1.01 minutes and for suture group it was 6.46.±2.19 minutes. Findings of age, gestational age and skin closure time have been shown in table 1.

In the skin staples group, 41 ladies (16.2%) had an elective c-section and 67 females (83.8%) had an emergency c-section. In the sutures group, 43 patients (19.3%) had elective c-sections and 65 cases (80.7%) had emergency c-sections. (See Figure 1).

As demonstrated in table 2, 19 (17.6%) patients in the skin staples group and 08 (7.40%) females in the sutures group acquired wound infection by the seventh post-operative day.

Table 2: Mean and Standard Deviation for Age, Gestational Age and Skin Closure Time in both Groups

Variable	Group i Skin staples	Group ii Prolene sutures	P value
Age of patient	28.53±4.27	29.17±4.29	0.845
Gestational age	38.29±0.46	38.33±0.48	0.065
Skin closure time (minutes)	2.01.±1.01	6.46.±2.19	<0.001

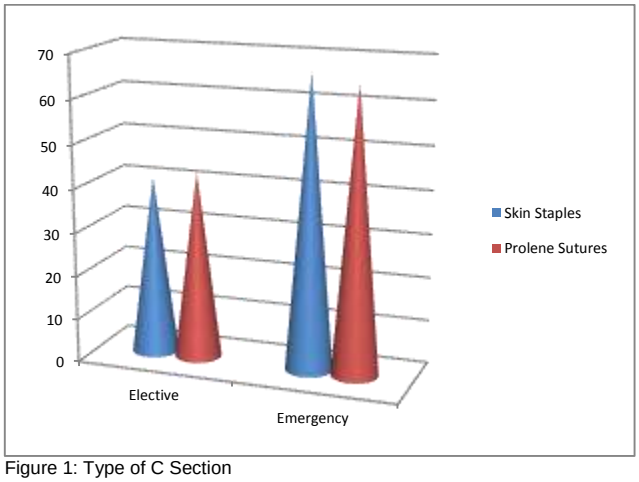

Figure 1: Type of C Section

Table 2: Assessment of Wound Infection on 7th Postoperative Day

Wound infection on 7th postoperative day	Group i Skin staples	Group ii Prolene sutures
Present	19 (17.60%)	08 (7.40%)
Absent	89 (82.40%)	100 (92.60%)

DISCUSSION

In obstetrics, the Caesarean section is the most usually conducted procedure. The way the skin is closed after surgery may have a big impact on how quickly you recover.[13] Numerous experiments evaluating staples and suture in the sealing of caesarean incisions have been published.[14,15] Mean age of patients in this study was 28.53±4.27 in skin staples group and 29.17±4.29 in prolene sutures group. Mean gestational age reported in this study was 38.29±0.46 and 38.33±0.48 for skin staples and prolene sutures respectively.

In comparison to subcutaneous fascia closing and skin suturing with non-absorbable monofilament suture prolene, Poprzeczny et al found some weak substantiation to recommend that the consolidated intervention of subcutaneous fascia closure and skin suturing with absorbable monofilament suture caprosyn is strongly correlated with an enhanced threat of post - operative wound infection.[16]

Bacterial infections in surgical incisions are caused by post-caesarean wound infections. This infection may occur after an abdominal (c-section) birth. The wound infection rates after CS reported in the present literature range from 3% to 16%, relying on the monitoring methods used to differentiate infections, the patient group, and the prophylactic antibiotics used.[17]

Our study reported rate of wound infection more prevalent in skin staples group in comparison with prolene sutures group. Our research adds to the growing body of knowledge in this field. Wound fatality has been the subject of a number of recent investigations, including clinical trials and meta-analyses.[1,18] The usage of staples vs subcuticular sutures exacerbated wound dehiscence and complication incidences, according to a meta-analysis including 877 women from five trials.[19]

In our investigation, skin closure with staplers took much less time than skin closure using prolene suture, which is consistent with earlier studies.[20,21] As a result of the use of staplers, the length of surgery and anaesthesia on patients will be significantly reduced, lowering the perioperative risk. It will also be useful in crowded obstetric care settings where a large number of individuals need caesarean sections. Suture closure was linked to a shorter hospital stay in a research conducted by Fox NS[22] (3 vs 4 days). Nevertheless, we think that the majority of the variance is due to modifications in hospital procedures.

The typical rates of aggregate wound complications and wound isolation, according to Basha SL et al, were 15.10 percent and 10.30 percent, respectively. Similar to composite wound complications (22 percent vs. 9 percent; p-value 0.001), wound separation occurred significantly more often in staple cases than in suture groups (17 percent vs. 5 percent; p-value 0.001). 1 In conclusion, our findings suggest the use of suture over staples in caesarean deliveries.

CONCLUSION

The overall findings of our study showed that wound infection is less likely to occur in patients of suture group as compared to staples group. Although, staples can only be beneficial in terms of skin closure time. Suture closure should be the preferable form of skin closure for all caesarean births, based on these findings and the outcomes of randomised studies in women having caesarean deliveries.

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