

## COMPARISON OF VICRYL SUTURE WITH PROLENE SUTURE FOR CLOSURE OF SKIN IN CAESAREAN SECTION

Dr. Naila Amjad<sup>\*1</sup>, Professor Dr. Meher-Un-Nisa<sup>2</sup>

<sup>\*1</sup>Resident FCSP obstetrics and gynecology), Lady Aitchison Hospital Lahore

<sup>2</sup>MBBS, MHPE, ICMT, FCPS), KEMU & Affiliated Hospital, Lahore, Lady Aitchison Hospital Lahore

<sup>1</sup>drnailaamajd@gmail.com

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Cesarean section, Skin closure, Vicryl suture, Prolene suture.

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Corresponding Author: \*

Dr. Naila Amjad

### Abstract

#### Objective:

To compare the outcomes of Vicryl sutures with Prolene sutures for wound closure after cesarean section surgery.

#### Methods:

This randomized clinical trial was conducted in the Department of Obstetrics and Gynecology at Lady Aitchison Hospital, Lahore, from August 2024 to February 2025. We included pregnant females who were planned for elective cesarean section. Patients were randomly divided into two equal groups. In group A, Vicryl sutures No. 1 were used for skin closure. In group B, Prolene sutures No. 1 were used for skin closure. After surgery, all patients were followed for 24 hours to determine the frequency of significant post-operative pain.

#### Results:

The mean age in Group A was  $25.8 \pm 2.70$  years, while in Group B it was  $26.1 \pm 2.56$  years ( $P=0.62$ ). The mean gestational age was  $37.9 \pm 1.16$  weeks in Group A and  $40.23 \pm 0.97$  weeks in Group B ( $P=0.33$ ). A comparison of the frequency of significant post-operative pain revealed that 8 patients (26.7%) in Group A (Vicryl Suture,  $N=30$ ) experienced significant post-operative pain, whereas 16 patients (53.3%) in Group B (Prolene Suture,  $N=30$ ) reported significant pain ( $P=0.03$ ).

#### Conclusion:

The present study results demonstrated that the use of Vicryl sutures is associated with significantly lower post-operative pain in comparison to Prolene sutures in patients undergoing cesarean section.

### INTRODUCTION

Cesarean delivery is among the most frequently performed surgical interventions for women worldwide.<sup>1</sup> The rates of cesarean sections differ significantly across countries, ranging from around 5% in many low-income nations to up to 47% in certain high-income regions.<sup>2</sup> While the World Health Organization has suggested that the optimal rate should not exceed 15%, it also recognizes that the ideal percentage remains unclear.<sup>3, 4</sup> In developed

healthcare systems, approximately 30% of women deliver via cesarean.<sup>5</sup>

Women who undergo cesarean delivery face a significantly higher risk—ranging from five to twenty times greater—of developing infections around the time of childbirth compared to those who have vaginal births.<sup>6, 7</sup> Post-operative pain and infection are among the most common complications associated with cesarean sections. The way the surgical wound is closed after the procedure can influence

patient outcomes. Several mechanical methods are used for wound closure, including staples, adhesive tapes, tissue adhesives, and sutures. Each technique has its own specific indications, benefits, and drawbacks. Suturing allows the wound to heal primarily, keeping tissue edges close until healing is sufficient to withstand stress independently. However, since sutures involve inserting foreign material into tissue, they can provoke a localized tissue reaction. During wound closure, maintaining a sterile environment and employing careful aseptic techniques are essential to reduce the risk of infection.<sup>5,8</sup>

The purpose of this study was to evaluate and compare the effectiveness of Vicryl and Prolene sutures in closing wounds following cesarean section procedures. Vicryl sutures eliminate the need for patients to return for stitch removal, which can enhance patient satisfaction. However, they may be associated with increased postoperative pain. Identifying a suture material that minimizes pain could significantly reduce morbidity related to cesarean deliveries.

**Methods:**

This randomized clinical trial was conducted in the Department of Obstetrics and Gynecology at Lady Aitchison Hospital, Lahore, from August 2024 to February 2025. We included pregnant females who were planned for elective cesarean section, having an age of 18-40 years and parity <5. Excluded patients were those who had low hemoglobin (<7 g/dl), a history of urogenital tract infections within 2 weeks of delivery, a history of bleeding disorders, and those who were allergic to the suture materials.

Data on patients' age, gestational age, and parity status will be collected for each patient. Patients were randomly divided into two equal groups. In group A, Vicryl sutures No. 1 were used for skin closure. In group B, Prolene sutures No. 1 were used for skin closure. After surgery, all patients were followed for 24 hours to determine the frequency of significant post-operative pain.

Data was analyzed using SPSS v25. Chi-square test was applied to compare the frequency of significant post-operative pain taking p-value <0.05 as significant association.

**RESULTS:**

The baseline characteristics of the two groups, Group A (Vicryl Suture, N=30) and Group B (Prolene Suture, N=30), were comparable. The mean age in Group A was 25.8 ± 2.70 years, while in Group B it was 26.1 ± 2.56 years (P=0.62). The mean gestational age was 37.9 ± 1.16 weeks in Group A and 40.23 ± 0.97 weeks in Group B (P=0.33). The average parity was 2.80 ± 0.71 in Group A and 2.76 ± 0.82 in Group B (P=0.87). These findings indicate no statistically significant differences between the groups in terms of age, gestational age, or parity (Table 1).

A comparison of the frequency of significant post-operative pain revealed that 8 patients (26.7%) in Group A (Vicryl Suture, N=30) experienced significant post-operative pain, whereas 16 patients (53.3%) in Group B (Prolene Suture, N=30) reported significant pain. This difference was statistically significant, with a P-value of 0.03 (Table 2).

**Table 1. Baseline Characteristics.**

	Group A, Vicryl Suture (N=30)	Group B, Prolene Suture (N=30)	P-value
Age (years)	25.8±2.70	26.1±2.56	0.62
Gestational Age (Weeks)	37.9±1.16	40.23±0.97	0.33
Parity	2.80±0.71	2.76±0.82	0.87

**Table 2. Comparison of Frequency of Significant Post-operative Pain.**

	Group A, Vicryl Suture (N=30)	Group B, Prolene Suture (N=30)	P-value
Significant Post-op Pain (%)	08 (26.7%)	16 (53.3%)	0.03

**DISCUSSION:**

The cesarean section is the most commonly performed major surgical procedure among women worldwide. However, between 5% and 12% of these cases experience postoperative complications, such as infections at the surgical site. Both patients and healthcare providers bear significant hardships due to these wound-related issues following cesarean deliveries.<sup>9</sup>

There is ongoing debate regarding the optimal suture material for closing the subcutaneous layer following a cesarean delivery. In the United States, surgeons frequently employ Vicryl and Monocryl sutures for closing transverse skin incisions after cesarean procedures.<sup>10</sup>

Achieving proper wound closure involves eliminating dead space, ensuring even distribution of stress along deep sutures, and maintaining tensile strength across the wound site. Factors related to the patient, such as individual healing responses, can influence complications like hypertrophic or wide scars, as well as issues with wound healing.<sup>11, 12</sup> The current work's objective was to correlate cesarean sections wound complications especially post-operative pain and sutures types used.

Absorbable sutures serve as temporary support for wounds, maintaining stability until sufficient healing occurs to handle normal stress. These sutures are manufactured from either natural or synthetic polymers. Natural options include collagen, surgical gut, and chromic. Their breakdown happens through enzymatic processes.<sup>13</sup>

Synthetic sutures are chemical polymers absorbed by hydrolysis and cause a lesser degree of tissue reaction following placement. These sutures include Polyglactin 910 (Vicryl), Poliglecaprone 25 (Monocryl), Polysorbond Polydioxanone. Non-absorbable sutures elicit a tissue reaction that results in encapsulation of the suture material by fibroblasts. Non-absorbable sutures are natural (surgical silk) or synthetic (nylon, Polypropylene-Prolene). Prolene, a monofilament suture, is an isotactic crystalline stereoisomer of a linear propylene polymer; it permits little or no saturation. The material does not adhere to tissues and is useful as a pull-out suture (e.g., subcuticular closure). Polypropylene also holds knot better than other

monofilament synthetic material. This material is biologically inert and elicits minimal tissue reaction. Prolene is not subject to degradation or weakening and maintains tensile strength for up to 2 years. This material is useful in contaminated and infected wounds, minimizing the chances of sinus formation and suture extrusion.<sup>14, 15</sup>

Bhawana et al. conducted a study on comparison of complications of Vicryl sutures with Prolene sutures for skin closure in CS patients. The authors reported significant post-operative pain in 35% patients in the Vicryl group and in 72% patients in the Prolene group. The authors reported wound infections in 11.0% patients in the Vicryl group and in 5.0% patients in the Prolene group.<sup>10</sup>

Another study by Omda et al. reported a wound infection rate in 4.5% patients using Prolene sutures and in 9.5% patients using Vicryl sutures. While severe scar occurred in 8.0% patients in the Prolene group and in 15.5% patients in the Vicryl group.<sup>16</sup>

**CONCLUSION:**

The present study results demonstrated that the use of Vicryl sutures is associated with significantly lower post-operative pain in comparison to Prolene sutures in patients undergoing cesarean section.

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