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Comparative Study of Vicryl Versus Chromic Catgut for Mediolateral Episiotomy Repair: A Prospective Randomized Study

Anusha SR[1], Pradeep Kumar J[2]*

[1]Associate Professor, Department of Obstetrics and Gynaecology, Basaveshwara Medical College and Hospital, Chitradurga, Karnataka, India

[2]Professor, Department of General Surgery, Basaveshwara Medical College and Hospital, Chitradurga, Karnataka, India

***Address for Correspondence:** Dr. Pradeep Kumar J, Professor, Department of General Surgery, Basaveshwara Medical College and Hospital, Chitradurga–577502, Karnataka, India
E-mail: jpradeepkumar42@gmail.com **& ORCID ID:** https://orcid.org/0009-0006-5686-9655

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ABSTRACT

Background: Episiotomy remains a commonly performed obstetric procedure, particularly in primigravidas and assisted vaginal deliveries. Appropriate perineal repair is essential to reduce postpartum morbidity. The choice of suture material plays a key role in postoperative pain, wound healing, and maternal satisfaction. This study compared Vicryl and Chromic Catgut for short-term maternal outcomes following mediolateral episiotomy repair.

Methods: This prospective randomized comparative study included 200 women who underwent mediolateral episiotomy after normal vaginal delivery at Basaveshwara Medical College and Hospital, Chitradurga, between March 2023 and March 2025. Participants were randomly allocated to Vicryl (n=100) or Chromic Catgut (n=100) groups. Episiotomy repair was performed using standard mattress or continuous suturing techniques. Postpartum pain was assessed using the Visual Analogue Scale (VAS), and wound healing was evaluated using the REEDA scale at 24–48 hours, 3–5 days, and 6 weeks postpartum.

Results: Women in the Vicryl group experienced significantly lower pain scores at all follow-up intervals compared to the Chromic Catgut group ($p<0.001$). Mean wound healing time was shorter with Vicryl (7.76±1.93 days vs 9.37±1.96 days). Inflammatory complications, particularly induration, were more frequent in the Chromic Catgut group (10% vs 1%). Maternal satisfaction at six weeks postpartum was higher among women whose episiotomies were repaired with Vicryl.

Conclusion: Vicryl sutures provide superior short-term outcomes compared to Chromic Catgut for mediolateral episiotomy repair, with reduced perineal pain, faster wound healing, and improved maternal satisfaction.

Key-words: Chromic Catgut, Episiotomy, Natural absorbable suture, Perineal Pain, Polyglactin 910(Vicryl), Wound healing

INTRODUCTION

Episiotomy, derived from the Greek terms epision (pubic region) and tome (to cut), refers to a surgical incision made in the perineum during vaginal delivery to enlarge the vaginal outlet. Although the global trend has shifted toward restrictive episiotomy practice, the procedure continues to be commonly performed in primigravidas, operative vaginal deliveries, and situations involving a rigid perineum or fetal compromise [1,2].

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While episiotomy is intended to prevent severe spontaneous perineal tears, its routine use has been increasingly questioned due to associated maternal morbidity. Postpartum morbidities such as perineal pain, edema, wound infection, induration, and delayed healing can adversely affect early ambulation, breastfeeding, and maternal psychological well-being [3,4]. Optimizing repair of episiotomies is therefore essential, and the choice of suture material plays a pivotal role in minimizing these adverse outcomes.

Chromic Catgut, a natural absorbable suture derived from collagen, has traditionally been used for episiotomy repair owing to its low cost and wide availability. It retains tensile strength for approximately 10–15 days and is degraded by proteolytic enzymes. However, its unpredictable absorption profile and tendency to

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provoke inflammatory tissue reactions limit its suitability for perineal wounds [5,6].

Vicryl (polyglactin 910) is a synthetic absorbable suture that undergoes predictable hydrolytic absorption over 56–70 days and is associated with minimal tissue reactivity. Its favorable handling characteristics and sustained tensile strength during the critical healing phase facilitate improved wound approximation and reduced postoperative discomfort [6]. With increasing emphasis on maternal comfort and quality-of-care indicators, identifying an optimal suture material for episiotomy repair remains clinically relevant. This study was conducted to compare Vicryl and Chromic Catgut regarding short-term maternal outcomes in an Indian tertiary care setting.

MATERIALS AND METHODS

Study Design and Setting- This prospective randomized comparative study was conducted in the Department of Obstetrics and Gynecology at Basaveshwara Medical College and Hospital, Chitradurga, from March 2023 to March 2025. Ethical clearance was obtained from the Institutional Ethical Committee before commencement of the study.

Study Population- A total of 200 women undergoing mediolateral episiotomy following normal vaginal delivery were enrolled and randomly allocated into Vicryl and Chromic Catgut groups.

Inclusion criteria- Primigravida and multiparous women undergoing vaginal delivery with mediolateral episiotomy.

Exclusion criteria- Women with perineal tears extending to the anal sphincter (3rd and 4th degree), precipitous labour, known coagulation disorders, uncontrolled Diabetes Mellitus, or severe anaemia were excluded to eliminate confounding factors affecting wound healing.

Episiotomies were repaired using 2-0-gauge suture material appropriate for the assigned group. To eliminate technique-related bias, all repairs were performed using the continuous non-locking suturing technique. Standard aseptic precautions were maintained. All participants received standard prophylactic antibiotics post-delivery.

Data Collection- Baseline demographic details, including age, parity, and BMI, were recorded. Postoperative pain was assessed using the Visual Analogue Scale (VAS), a validated tool for pain measurement [7], and wound edema was graded using the REEDA scale [8]. Wound complications and time to complete healing were documented at 24–48 hours, 3–5 days, and 6 weeks postpartum.

Statistical Analysis- Continuous variables were expressed as mean±standard deviation. Categorical variables were analyzed using the Chi-square test, and continuous variables were compared using independent t-tests. Statistical significance was set at $p<0.05$.

Ethical Approval- Ethical approval was obtained from the Institutional Ethics Committee, BMCH, Chitradurga.

RESULTS

The mean age of participants in the Vicryl group was 25.2±2.7 years, and in the Chromic Catgut group, 25.8±3.0 years. The average BMI values (23.04±1.91 and 23.26±2.14, respectively) were comparable, confirming that baseline characteristics were well balanced across both groups. The mean parity was similar, indicating an evenly distributed obstetric profile (Table 1).

Table 1: Patient Demographics

Group	Age (mean±SD)	BMI (mean±SD)	Mean Parity
Vicryl	25.2±2.72	23.04±1.91	1.58
Chromic Catgut	25.8±3.08	23.26±2.14	1.38
p-value	0.12	0.56	0.08

p>0.05= No significant baseline differences

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The incidence of wound infection and induration was lower with Vicryl (3% and 1%, respectively) than with Chromic Catgut (7% and 10%, respectively). Although both suture materials are absorbable, Vicryl's smoother texture and minimal tissue reaction likely contributed to these improved outcomes. Only three minor wound dehiscences occurred in the Vicryl group, compared with four in the Catgut group, all managed conservatively without resuturing.

Pain assessment using the VAS scale revealed a distinct advantage for Vicryl. At 24–48 hours, most women in the Vicryl group reported mild-to-moderate discomfort, whereas most of the Chromic Catgut group reported moderate-to-severe pain. Pain intensity continued to decrease more rapidly in the Vicryl group by day 5 and was minimal at 6 weeks. These findings suggest a faster resolution of perineal tenderness when synthetic absorbable sutures are used. Comparison of postoperative pain scores, wound complications and healing duration between the two groups is summarized in Table 2.

Table 2: Summary of Key Maternal Outcomes

Group	VAS Pain 24–48h (mean±SD)	VAS Pain 3–5d (mean±SD)	VAS Pain 6w (mean±SD)	Wound Infection (n)	Wound Dehiscence (n)	Induration (n)	Healing Days (mean±SD)
Vicryl	32.07±14.78	21.27±9.66	6.91±5.05	3	3	1	7.76±1.93
Chromic Catgut	55.25±16.00	39.08±16.17	9.68±6.60	7	4	10	9.37±1.96
p-value	<0.001	<0.001	<0.001	0.20	0.70	<0.001	<0.001

Mean healing time was significantly shorter in the Vicryl group (7.76±1.93 days) compared with the Chromic Catgut group (9.37±1.96 days). The REEDA scale demonstrated less perineal edema in the Vicryl group at 24–48 hours, which corresponded with reduced inflammation and better wound approximation. Complete epithelialization was achieved in the Vicryl group by the second postpartum week. Perineal edema assessed using the REEDA scale is presented in Table 3, and the distribution of VAS pain severity following delivery in both groups is shown in Table 4.

Table 3: Edema Scores Distribution (REEDA scale at 24–48 h)

Group	Score 0	Score 1	Score 2	Score 3	p-value
Vicryl	28	20	29	23	0.92 (NS)
Chromic Catgut	23	25	28	24	

Table 4: VAS Pain Severity Distribution at 24–48 h after delivery

Group	0–20	21–40	41–60	61–80	81–100	p-value
Vicryl	20	53	22	4	1	<0.001
Chromic Catgut	0	20	46	25	9	

When analyzed by parity, primiparous and multiparous women showed similar trends—Vicryl consistently resulted in lower pain and complication rates across all subgroups. The influence of parity on infection rates was minimal, confirming that the suture material, rather than parity, was the primary determinant of healing outcomes. The infection rates according to parity are detailed in Table 5.

Table 5: Infection Rates Stratified by Parity

Group	Parity 1 (No Infection)	Parity 1 (Infection)	Parity 2 (No Infection)	Parity 2 (Infection)	Parity 3 (No Infection)	Parity 3 (Infection)
Vicryl	51	2	35	1	11	0
Chromic Catgut	68	3	18	2	7	2

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At 6-week follow-up, most women in the Vicryl group reported near-complete pain relief, minimal scarring, and higher satisfaction with wound appearance and comfort during ambulation and intercourse. Participants repaired with Chromic Catgut reported more itching and localized induration during the same period.

DISCUSSION

This prospective, randomized comparative study demonstrates that Vicryl sutures are associated with significantly improved short-term maternal outcomes compared with Chromic Catgut for mediolateral episiotomy repair. Women in the Vicryl group experienced lower perineal pain scores, faster wound healing, fewer inflammatory complications, and higher overall satisfaction, highlighting the clinical advantages of synthetic absorbable sutures in obstetric perineal repair.

Perineal pain is the most frequently reported and clinically significant morbidity following episiotomy, as it directly affects early ambulation, breastfeeding, maternal comfort, and psychological well-being. In the current study, VAS pain scores were consistently and significantly lower in the Vicryl group at all postoperative assessment intervals, including 24–48 hours, 3–5 days, and 6 weeks postpartum. This finding strongly supports the hypothesis that suture material plays a crucial role in determining postoperative pain intensity and duration. These results are in concordance with the Cochrane review by Kettle *et al*. [9], which demonstrated reduced short-term pain and analgesic requirements with synthetic absorbable sutures compared to catgut. Similar observations have been reported by Santos *et al*. [10] and Patel *et al*. [11], reinforcing the reproducibility of these outcomes across different populations and clinical settings.

The superior pain outcomes associated with Vicryl can be attributed to its smooth braided structure, predictable hydrolytic absorption, and minimal tissue drag, which collectively reduce local tissue trauma and inflammatory response. In contrast, Chromic Catgut undergoes enzymatic proteolytic degradation, a process known to provoke variable absorption and heightened local inflammatory reaction, leading to increased nociceptor stimulation and prolonged discomfort. This biological mechanism likely explains the higher pain scores and delayed resolution of perineal tenderness observed in the Chromic Catgut group in the present study.

Wound healing outcomes in the current study clearly favored Vicryl, with a significantly shorter mean healing time and earlier epithelialization. Sustained tensile strength during the critical early healing phase allows Vicryl to maintain effective wound approximation, thereby facilitating faster tissue regeneration. These findings are consistent with observations by Bick *et al*. [12], who emphasized that synthetic absorbable sutures provide more uniform absorption and improved wound integrity. Indian studies by Rani and Begum [13] and Kumar *et al*. [14] similarly reported faster wound healing and superior perineal comfort with Vicryl, further supporting its suitability for routine episiotomy repair in resource-limited and high-volume obstetric settings.

Inflammatory complications, particularly induration, were significantly more frequent in the Chromic Catgut group in the present study. Although the incidence of overt wound infection was low and comparable between the two groups, the higher rate of induration in the Catgut group suggests a greater degree of subclinical inflammation, which may contribute to persistent discomfort, itching, and delayed functional recovery. These findings corroborate previous reports highlighting the higher antigenicity and foreign-body reaction associated with natural absorbable sutures, especially in highly vascular and contaminated areas such as the perineum.

Parity-wise analysis revealed that the benefits of Vicryl were consistent across primiparous and multiparous women, indicating that the observed improvements in pain relief and wound healing were primarily attributable to the suture material rather than obstetric variables. This observation aligns with the conclusions of Lappen and Gossett[15], who emphasized that episiotomy outcomes are more strongly influenced by repair materials and techniques than by maternal characteristics or parity.

Maternal satisfaction at six weeks postpartum was notably higher among women in the Vicryl group, with reports of minimal residual pain, better wound comfort, and reduced interference with daily activities and resumption of sexual intercourse. Maternal satisfaction is an important composite outcome reflecting both physical healing and psychological recovery after childbirth, and the favorable results observed with Vicryl

underscore its clinical relevance. Similar findings have been reported by Kumar *et al*. [14], who identified improved maternal satisfaction as a key advantage of synthetic absorbable sutures.

Although Vicryl is marginally more expensive than Chromic Catgut, its association with reduced postoperative morbidity, faster recovery, and improved maternal satisfaction suggests it is superior in overall cost-effectiveness. Reduced need for analgesics, fewer wound-related complaints, and quicker return to normal activities may offset the initial material cost. As emphasized by Berghella *et al*. [16], Evidence-based obstetric practice should prioritize interventions that enhance maternal quality of life and postpartum recovery, even when initial costs are slightly higher.

CONCLUSIONS

Vicryl sutures are superior to Chromic Catgut for mediolateral episiotomy repair, offering significant advantages, including reduced perineal pain, faster wound healing, fewer inflammatory complications, and improved maternal satisfaction. Based on the findings of this study and supporting evidence from the literature, Vicryl should be preferred over Chromic Catgut for routine episiotomy repair to optimize maternal outcomes in contemporary obstetric practice. Future research should evaluate long-term consequences, such as dyspareunia, and conduct formal cost-benefit analyses to further validate this transition in resource-limited settings.

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CONTRIBUTION OF AUTHORS

Research concept- Dr. Anusha S R and Dr. Pradeep Kumar J
Research design- Dr. Anusha S R
Supervision- Dr. Pradeep Kumar J
Data collection- Dr. Anusha S R
Data analysis and interpretation- Dr. Pradeep Kumar J
Literature search- Dr. Anusha S R
Writing article- Dr. Anusha S R
Critical review- Dr Pradeep Kumar J
Final approval- Dr. Anusha S R and Dr. Pradeep Kumar J

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