

Comparison Between Maternal Complications of Chromic Catgut and Vicryl Rapide Sutures used for Episiotomy Repair

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ABSTRACT

Objective: To compare the outcomes of Vicryl Rapide versus Chromic Catgut suture used for episiotomy closure in primigravidae.

Study Design: Randomized controlled trial (ClinicalTrials.gov: NCT07073131).

Place and Duration of Study: Department of Obstetrics and Gynecology, Combined Military Hospital, Gujranwala, Pakistan from Jul 2024 to Jan 2025.

Methodology: Total 202 females undergoing delivery through episiotomy were enrolled from labor room. At end of procedure, females were randomly divided in two Groups. In Group-A, females underwent suturing by using Vicryl rapide. In Group-B, females underwent suturing by using Chromic Catgut. After 24 hours of delivery, females were examined for pain score. After 7 days, females were examined for wound infection, inflammation and dehiscence. All this information will be recorded in proforma.

Results: In this study, mean age of females in Group-A was 26.77 ± 5.47 years and in Group-B was 26.72 ± 5.34 years. After 24 hours of episiotomy, mean pain score of females was 2.31 ± 1.07 in Group-A and in Group-B was 3.91 ± 1.41 . After 7 days of episiotomy, mean pain score of females was 0.99 ± 0.77 in Group-A vs 1.95 ± 0.84 in Group-B. Wound infection was noted in 3 (3.0%) vs. 13 (12.9%), inflammation at wound site in 6 (5.9%) vs. 24 (23.8%) and wound dehiscence was noted in 2 (2.0%) vs. 20 (19.8%) females (p -value < 0.05).

Conclusion: It has been concluded that Vicryl Rapide is more effective for episiotomy wound and lead to less wound complications and pain as compared to Chromic Catgut.

Keywords: Episiotomy, Chromic Catgut Suture, Pain Score, Vaginal Delivery, Vicryl Rapide, Wound Infection.

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INTRODUCTION

An episiotomy is a perineal incision used to increase the vulvae outlet's diameter and facilitate birthing.¹ After vaginal births, a considerable proportion of women have perineal damage and need sutures. Dyspareunia, improper healing, and perineal discomfort might arise from this. These parameters will be influenced by the type of suture material employed.² The suture material used to heal a perineal laceration or episiotomy is mostly a matter of personal preference. The majority of institutions employed chromic Catgut extensively. Collagen in the chromic intestine is broken down by proteolytic enzymes, which causes the tissue to become inflamed.³

Since Chromic Catgut now seems to be linked to increased postpartum pain, synthetic absorbable polymers like polyglactin and polyglycolic acid have mainly replaced Chromic Catgut. Vicryl-rapide (Ethicon), a more quickly dissolving version of

polyglactin 910, was created to mimic the effectiveness of surgical gut sutures. Vicryl-rapide is more readily absorbed in tissue since it is made of a polymer substance that has a lower molecular weight than standard Polyglactin 910.^{4,5} After five days, it loses half of its tensile strength, and in ten to fourteen days, it practically loses all of it. It has been demonstrated that Vicryl-rapide performs similarly to nylon in closing punch-biopsy wounds without requiring the removal of sutures.^{6,7}

Compared to Chromic Catgut sutures, Vicryl Rapide sutures are far less painful and promote better wound healing for episiotomy repair.^{8,9} Researchers use Vicryl, which is polyglactin and causes less tissue reaction and is absorbed by hydrolysis, in place of Chromic Catgut, which is made from collagen and causes an inflammatory response into the tissues as it is broken down by proteolytic enzymes and phagocytosis. This is because it is known that long-term complications following episiotomy repair are common. There is disagreement about the results of the best suture material.^{1,10}

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Complications of Chromic Catgut and Vicryl Rapid

In order to compare the results of Chromic and Vicryl Rapide Catgut sutures used in episiotomy, this study was designed. Mostly primigravida females who undergo vaginal delivery, episiotomy is performed to widen the vaginal canal and make delivery more feasible. For suturing of episiotomy, different materials are used. Research has demonstrated that Vicryl Rapide is superior to Chromic Catgut in terms of reducing pain and promoting wound healing. But, the evidence is limited and only one study found in local literature before. Therefore, to determine the impact of Vicryl Rapide for episiotomy in primigravida females, we want to conduct this study, to get local evidence and implement the results in local population. This will help us to improve our knowledge and practice and we will be able to implement more effective suturing material in primigravida without risking the complications of wound infection or dehiscence and early healing with less pain.

METHODOLOGY

This Randomized controlled trial was carried out at the Department of Obstetrics and Gynecology, CMH Gujranwala, Pakistan from July 2024 to January 2025 after obtaining approval from Ethical Review Board (ERC letter no: 37-2024 dated 10-01-2024) and trial registration (ClinicalTrials.gov: NCT07073131).

By using WHO calculator, sample size of 202 females; 101 in each Group is calculated with 80% power of study, 5% significance level and percentage of wound dehiscence i.e. 4% with Vicryl Rapide and 14% with Chromic Catgut.¹¹ Females were enrolled by using Non-probability, consecutive sampling technique, who fulfilled following criteria.

Inclusion Criteria: Primigravida of age 18-35 years, presenting at gestational age during 37-40 weeks, undergoing episiotomy during vaginal delivery were enrolled. Episiotomy is a surgical enlargement of the vaginal orifice by an incision of the perineum during delivery. Episiotomy was given at the crowning of head (a mediolateral incision of 3-4cm in the perineum).

Exclusion Criteria: Females with abnormal placenta, non-cephalic presentation, multiple fetus, premature rupture of membranes, unclean vaginal examination, diabetes, pre-delivery hemoglobin <9 g/dl, manual removal of placenta, vulval hematoma and vaginal tears were excluded.

All the females were enrolled from labor room and their informed consent was taken. Demographics were noted. Then females underwent episiotomy. At end of procedure, females were randomly divided in two Groups by using lottery method. In Group-A, females underwent interrupted suturing by using Vicryl rapide. In Group-B, females underwent interrupted suturing by using Chromic Catgut. After delivery, females were shifted in gynecology wards and were followed-up there for 24 hours. After 24 hours females were examined or pain score by using visual analogue scale. Then females were discharged after examining the episiotomy wound and were followed-up for 7 days in OPD. During follow-up, females were examined for pain score, wound infection, inflammation and dehiscence. Wound infection was labeled if female developed pain and pus discharge at wound site, along with fever (>100oF) within 7 days of episiotomy. Wound inflammation was labeled if female developed pain, tenderness and swelling within 7 days of episiotomy. Wound dehiscence was labeled if there was partial or total separation of previously approximated wound edges, due to a failure of proper wound healing within 7 days of episiotomy. Females with complications were managed as per hospital protocol (Figure). All this information was recorded in proforma.

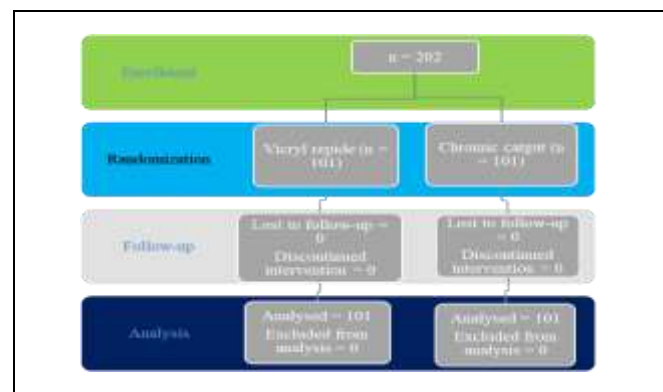


Figure: Patient Flow Diagram (n= 202)

Data was entered and analyzed in Statistical Package for Social Sciences (SPSS)-25. Numeric variables like age, gestational age, BMI and pain score were presented in the form of Mean±SD while categorical variables like residence, personal hygiene, and wound related complications were presented in the form of frequency (%). Both Groups were compared for mean pain score by using independent samples t-test and for wound infection, dehiscence

and inflammation by using chi-square test. The *p*-value ≤ 0.05 was taken as significant.

RESULTS

In this study, total 202 females underwent cesarean section were enrolled and randomized in two equal Groups. The mean age of females randomized to Group-A was 26.77 ± 5.47 years while the mean age of females randomized to Group-B was 26.72 ± 5.34 years. The mean gestational age at delivery was 38.61 ± 1.04 weeks in Group-A while the mean gestational age at delivery was 38.65 ± 1.61 weeks Group-B. The mean BMI of females randomized to Group-A was 25.22 ± 3.19 kg/m² while the mean BMI of females randomized to Group-B was 25.02 ± 3.27 kg/m². In Group-A, 40 (39.6%) females coming from rural areas, 18(17.8%) were living in urban areas and 43(42.6%) were living in semi-urban areas. In Group-B, 47(46.5%) females coming from rural areas, 16(15.8%) were living in urban areas and 38(37.6%) were living in semi-urban areas. In Group-A, 43(42.6%) females had good personal hygiene, 31(30.7%) had average hygiene level and 27(26.7%) had poor hygiene. In Group-B, 32(31.7%) females had good personal hygiene, 30(29.7%) had average hygiene level and 39(38.6%) had poor hygiene. In Group-A, 54(53.5%) females were booked and 47(46.5%) unbooked. In Group-B, 48(47.5%) females were booked and 53(52.5%) unbooked, Table-I.

Table-I: Basic Demographic Details of Females Enrolled in the Trial (n=202)

Demographic Details	Group-A (n=101)	Group-B (n=101)
Age (years)	26.77 ± 5.47	26.72 ± 5.34
Gestational age (weeks)	38.61 ± 1.04	38.65 ± 1.61
BMI (kg/m ²)	25.22 ± 3.19	25.02 ± 3.27
Residence		
Rural	40 (39.6%)	47 (46.5%)
Urban	18 (17.8%)	16 (15.8%)
Semi-urban	43 (42.6%)	38 (37.6%)
Personal hygiene		
Good	43 (42.6%)	32 (31.7%)
Average	31 (30.7%)	30 (29.7%)
Poor	27 (26.7%)	39 (38.6%)
Booking status		
Booked	54 (53.5%)	48 (47.5%)
Unbooked	47 (46.5%)	53 (52.5%)

After 24 hours of episiotomy, mean pain score of females was 2.31 ± 1.07 in Group-A which was significantly less than pain score observed in Group-B (3.91 ± 1.41 , $p < 0.0001$). After 7 days of episiotomy, mean pain score of females was 0.99 ± 0.77 in Group-A which

was significantly less than pain score observed in Group-B (1.95 ± 0.84 , $p < 0.0001$). Wound infection was noted in 3(3.0%) females in Group-A while in Group-B, wound infection occurred in 13(12.9%) females. The difference was significant (p -value=0.009). Inflammation at wound site was noted in 6(5.9%) females in Group-A while in Group-B, wound infection occurred in 24(23.8%) females. The difference was significant (p -value < 0.0001). Wound dehiscence was noted in 2(2.0%) females in Group-A while in Group-B, wound infection occurred in 20(19.8%) females. The difference was significant (p -value < 0.0001), Table-II.

Table-II: Comparison of Outcome observed in the Trial (n=202)

Outcomes	Group-A (n=101)	Group-B (n=101)	<i>p</i> -value
Pain after 24 hours	2.31 ± 1.07	3.91 ± 1.41	<0.0001
Pain after 7 days	0.99 ± 0.77	1.95 ± 0.84	<0.0001
Wound infection	3 (3.0%)	13 (12.9%)	0.009
Inflammation	6 (5.9%)	24 (23.8%)	<0.0001
Dehiscence	2 (2.0%)	20 (19.8%)	<0.0001

Personal hygiene was observed as effect modifiers. It has been observed that in females with good personal hygiene had less risk of wound infection than poor hygiene. In females with good hygiene, wound infection occurred in 1(2.3%) vs. 6(18.8%), with Group-A vs. Group-B, respectively (p -value=0.038). However, in females with average [1 (3.2%) vs. 4(13.3%)] and poor hygiene [1 (3.7%) vs. 3(7.7%)], there was no significant difference was noted (p -value>0.05). Likewise, inflammation was significantly less with Group-A than Group-B in females with good (p -value<0.05) and average personal hygiene but insignificant in females with poor personal hygiene (P -value>0.05). Likewise, dehiscence was significantly less with Group-A [1 (2.3%)] than Group-B in females with good [8 (25.0%), p -value<0.05] and average personal hygiene but insignificant in females with poor personal hygiene (1 (3.7%) vs. 5 (12.8%), p -value>0.05), Table-III.

Table-III: Comparison of Both Trial Groups for Outcome when stratified for Personal Hygiene (n = 202)

Personal Hygiene	Groups		<i>p</i> -value
	Group-A (n=101)	Group-B (n=101)	
Good Personal Hygiene	1 (2.3%)	6 (18.8%)	0.038
Average Personal Hygiene	1 (3.2%)	4 (13.3%)	0.195
Poor Personal Hygiene	1 (3.7%)	3 (7.7%)	0.639
Inflammation			
Good Personal hygiene	3 (7.0%)	10 (31.3%)	0.011

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Table-IV: Comparison of both Trial Groups for Outcome when Stratified for Booking Status (n=202)

Booking Status	Groups		p-value
	Group-A (n=101)	Group-B (n=101)	
Booked females	0 (0%)	5 (10.4%)	0.021
Unbooked females	3 (6.4%)	8 (15.1%)	0.210
Inflammation present in			
Booked females	2 (3.7%)	10 (20.8%)	0.012
Unbooked females	4 (8.5%)	14 (26.4%)	0.035
Dehiscence			
Booked females	0 (0%)	7 (14.6%)	0.004
Unbooked females	2 (4.3%)	13 (24.5%)	0.005

DISCUSSION

In this trial, we observed that the mean pain score of females was 2.31 ± 1.07 in Vicryl Rapide Group and in Chromic Catgut Group was 3.91 ± 1.41 after 24 hours of episiotomy. However, after 7 days of episiotomy, the mean pain score of females was 0.99 ± 0.77 in Vicryl Rapide Group vs 1.95 ± 0.84 in Chromic Catgut Group. Vicryl Rapide is linked to less discomfort than Chromic Catgut, and the difference was shown to be significant. In our trial, we observed wound infection in 3(3.0%) females with Vicryl Rapide while in 13(12.9%) females with Chromic Catgut. Similarly, inflammation at wound site was noted in 6(5.9%) females with Vicryl Rapide while in 24(23.8%) females with Chromic Catgut and wound dehiscence was also noted in 2(2.0%) females with Vicryl Rapide but in 20(19.8%) females with Chromic Catgut. The statistical difference calculated was highly significant (p -value < 0.0001).

Episiotomy is a common obstetric procedure used to reduce perineal trauma during childbirth. The efficacy and safety of two commonly used suture materials, Chromic Catgut and Vicryl Rapide, in reducing postpartum morbidity following episiotomy repair have been evaluated in different studies.¹² Compared to Chromic Catgut, fast-absorbing polyglactin sutures are favored due to their non-allergic qualities, higher tensile strength, decreased risk of discomfort, and decreased risk of infection.¹³ Vicryl Rapide thread is superior to Chromic Catgut thread in terms of reducing perineal discomfort and healing wounds when used for perineal perineum repairs or sutures.¹⁴ Gupta *et al.*, conducted a trial and found that the mean pain score was 2.88 ± 1.27 with Vicryl Rapide while 3.56 ± 1.23 with Chromic Catgut after 2 days of episiotomy while after 7 days, mean pain score was 0.72 ± 0.61 with Vicryl Rapide while 1.39 ± 0.83 with Chromic Catgut. The wound infection occurred in 4% with Vicryl Rapide but in 14% cases

with Chromic Catgut, wound inflammation and dehiscence in 4% vs. 14% cases, respectively ($p < 0.05$).¹¹

Vicryl Rapide was linked to decreased discomfort (32.5% vs. 57%) at 3–5 days compared to Chromic Catgut, according to another Indian study. Additionally, there was a notable decrease in wound dehiscence, painful stitches, and indurations (4% vs 13.5%). The Chromic Catgut Group experienced wound infections (3.5%) and wound re-suturing (2%) while the Vicryl Rapide Group did not.¹⁵ Monis *et al.*, conducted a study in Bahawalpur to assess the effectiveness of Chromic Catgut suture with Vicryl Rapide suture for episiotomy repair. They discovered that the effectiveness was 48.0% in females with Chromic Catgut and 78.67% in females with Vicryl Rapide (p -value < 0.0001). They came to the conclusion that Vicryl Rapide sutures are superior than Chromic Catgut sutures for episiotomy repair because they have a much lower risk of discomfort and promote wound healing.⁸

Chohan *et al.*, carried out a comparative prospective study at Shaikh Zayed Hospital, Lahore. they observed that after 48 hours of episiotomy, the pain was present in in (32%) females with Vicryl Rapide and in 50.5% females with Chromic Catgut (p -value = 0.007). Similarly, 1.9% of females with Vicryl Rapide and 25.2% of females with Chromic Catgut (p -value < 0.001) required analgesia after 7 days (pain score > 4). The best suture for episiotomy repair, according to researchers, is Vicryl Rapide, which reduces discomfort after 48 hours and requires less analgesia by the seventh day.¹⁶ Syed *et al.*, carried out a trial in Sir Ganga Ram Hospital, Lahore and observed that the comparison of pain (based on visual analogue scale) showed that 32.0% females in Vicryl Rapide sutures versus 49.5% females in Chromic Catgut had pain after 48 hours of episiotomy repair (p -value = 0.01). They found that when it comes to discomfort and analgesic needs, Vicryl Rapide performs better than Chromic Catgut in episiotomy healing.¹⁷

Bose *et al.*, compared the effectiveness of Vicryl Rapide and Chromic Catgut sutures in treating perineal discomfort following episiotomy repair, finding that Chromic Catgut sutures were 82% effective and Vicryl Rapide sutures were 98% effective.¹⁸ Another study compared to 32.5% of patients who received Chromic Catgut suture, 57% of patients who received Vicryl Rapide suture reported no perineal discomfort after episiotomy.¹⁹ According

to another research, compared to the Chromic Catgut Group, the Vicryl Rapide Group exhibited noticeably less pain out of 50 patients, and the majority of them did not require analgesia (p -value-0.000).¹ Bharathi *et al.*, determined that the best suture material for an episiotomy is Vicryl Rapide, which demonstrated superior wound healing and less perineal discomfort than Chromic Catgut, whereas the latter Group experienced more wound infections and resuturing.¹⁵ Gowda and Rakshitha conducted a trial in India and found that on day 1, 66.6% females with Chromic Catgut had severe pain compared to 13.3% females with Vicryl rapide. On day 7, among the 15 females, who had mild pain, 14 members (93.3%) belong to Chromic Catgut Group and 1 member (6.66%) belong to Vicryl rapide.²⁰

LIMITATIONS OF STUDY

In this trial, we observed limited number of variables and did not observed the healing rate as well as duration to return to routine movements and working were not studied.

CONCLUSION

It has been concluded that Vicryl Rapide is more effective for episiotomy wound and lead to less wound complications and pain as compared to Chromic Catgut. So in future, for episiotomy, especially in primigravida females, Vicryl Rapide will be used instead of Chromic Catgut that is has more earlier absorption capacity that would cause less pain and more wound healing.

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Authors Contribution

Following authors have made substantial contributions to the manuscript as under:

HI & AB: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

EP & ZS: Conception, data analysis, drafting the manuscript, approval of the final version to be published.

AA & AW: Data acquisition, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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