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**Original Research Article**

# A comparative study of episiotomy suturing using suture material chromic catgut versus Rapide Vicryl and its outcome

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## ABSTRACT

**Background:** Episiotomy is a surgical incision which is made in the perineum to enlarge the vaginal opening for birth, with a purpose to facilitate the completion of the second stage of labour to improve both the maternal and the neonatal outcomes. A significant number of women experience perineal trauma following vaginal deliveries which may result in perineal pain, dyspareunia and faulty healing. The type of suture material which is used, will influence these factors. Objectives were to assess the effect of suture materials (Rapide Vicryl versus catgut) used in episiotomy and evaluate the wound healing characteristics on day 2 and day 7.
**Methods:** All the pregnant women in labour admitted in labour room of Navodaya medical college, 200 patients satisfying the inclusion and exclusion criteria were taken and were assigned in one of the groups for episiotomy and suturing was done using either of the materials-Vicryl Rapide 2-0 or chromic catgut 1-0, followed up the women in the postnatal ward on day 2 and day 7 and look for immediate complications of episiotomy like temperature, severe pain, hematoma induration, wound gapping and discharge.
**Results:** Among a total of 200 cases, at 48 hours, there was no significant difference according to the pain measurement scores, but the median consumption of analgesics was significantly lower with fast-absorbing polyglactin 910. There was no difference in the association with dysparenia at 6 weeks after the delivery between chromic catgut (19%) compared with standard polyglactin 910 group (8%).
**Conclusions:** Fast-absorbing form of polyglactin sutures are preferred over chromic catgut because of their non-allergic properties, increased tensile strength, lesser probability of pain and lower chances of infection.

**Keywords:** Episiotomy, Rapide Vicryl, Chromic catgut, Wound healing, Analgesia

## INTRODUCTION

Episiotomy is one of the most often practiced surgical procedures in obstetrics, defined as a surgical enlargement of the vaginal orifice by an incision over the perineum.[1] It was introduced about 200 years ago, but became accepted by most obstetricians only after Pomeroy's study in 1918.[2]

The two most commonly used types of episiotomies are the midline or median and the mediolateral. The purpose of this procedure is to enhance the delivery process and prevent perineal tears to improve both the maternal and neonatal outcomes.[3]

A significant number of women experience perineal trauma following vaginal deliveries and they require repair by suturing. This may result in perineal pain, dyspareunia and faulty healing. The type of suture material which is used, will influence these factors.[3,4]

Perineal trauma affects the physical, mental and social well-being of the mother in her puerperium. A large proportion of women undergo short term perineal pain and

nearly 20% have long term problems like dyspareunia, removal of residual suture material, wound dehiscence and re-suturing.[5]

Prevalence of the episiotomy varies throughout the world depending on whether it is used as a routine or a restrictive procedure. The overall pooled prevalence of episiotomy in practice is 45.11%. The rates are higher in developing countries, since the use of restricted episiotomy is not being practiced widely in primigravidas. Although the Cochrane database review has now recommended the practice of restrictive episiotomy, routine use of it continues in most of our maternity units until now.[2]

The best technique for episiotomy repair would be that which requires shorter time to perform and less use of suture materials, and that which produces minimal pain in the short and long term, permitting the resumption of intercourse as early as possible with less pain, and requiring minimal need to remove the sutures and decreases the need for re-suturing.

In addition to the degree of the trauma, the surgical skill, the type of suture material used, and the suturing technique for perineal repair can have a major effect on the magnitude and degree of morbidity experienced by women following repair.[5]

India being a developing country, chromic catgut is being used in almost all the government institutions. Using suture materials of natural origin are associated with a more marked tissue reaction as compared to that caused by synthetic materials. Studies have disclosed synthetic suture materials like polyglactin to have less post-natal morbidity compared to catgut but with the risk of increased need for suture removal.[6,7] This was dealt by irradiated polyglactin which gets absorbed rapidly than the standard polyglactin.

Thus, the knowledge of suture material and technique used for closure of episiotomy helps to know the proper technique and time required for episiotomy wound closure and also about the wound healing, perineal care.

Hence, this study is being done to understand the type of suture material to be used for episiotomy and its outcome.

### *Aim*

Aim of the study to assess the effect of suture materials (Rapide Vicryl versus catgut) used in episiotomy, to evaluate the wound healing characteristics of chromic catgut versus Rapide Vicryl and these parameters were assessed at day 2 and day 7.

## METHODS

### *Source of data*

All pregnant women in labour admitted in labour room and need an episiotomy in Navodaya medical college hospital and research centre.

Follow up cases of episiotomy.

### *Study design*

Randomized controlled trial design was used in this study.

### *Study period*

The study carried out for 1.5 years (1st January 2021 to 30th June 2022).

### *Place of study*

The study was conducted at Navodaya medical college hospital and research centre, Raichur.

### *Sample size*

The patients involved in study were 200.

### *Inclusion criteria*

All women who need episiotomies following spontaneous or instrumental deliveries were enrolled for study. Patient willing to give informed consent.

### *Exclusion criteria*

Preterm labour, small for gestational age, 2 previous caesarean section, vaginal tears, perineal tears, intrapartum fever, HIV, IUD, patient not willing to give informed consent.

### *Methodology*

After obtaining ethical committee clearance, all the pregnant women in labour admitted in labour room of Navodaya medical college, who had a normal vaginal delivery, requiring an episiotomy, satisfying the inclusion and exclusion criteria were eligible to enter the trail. Enrolment took place immediately after delivery. After obtaining written and informed consent from the patient. Patients were divided into two groups of 100 each and assigned as: group A: Suturing using chromic catgut and group B: Suturing using Vicryl Rapide.

The women were assigned in one of the groups for episiotomy and suturing was done using either of the materials-Vicryl Rapide 2-0 36 mm round bodied half circle/chromic catgut 1-0 30 mm round bodied half circle.

All patients were interviewed and examined at 48 hrs and 7 days, for immediate complications of episiotomy like temperature, severe pain, hematoma induration, wound gapping and discharge. Local examination was done for nature of healing. All women were routinely put on

analgesic tab. diclofenac sodium 50 mg 6 hrly and antibiotic cap. Amoxicillin 500 mg 8 hrly for 5 days. Wound healing will be measured in terms of edema, redness, discharge and dehiscence. Perineal pain was assessed by patients registering their pain perception on a visual analogue scale. At 6 weeks, patients were reviewed for any wound dehiscence, infection and residual suture material. At twelve weeks, patients were called over the phone and enquired regarding the resumption of sexual activity and the difficulties encountered with it.

***Statistical tests***

Chi square test will be used for analyzing categorical data.

***Statistical analysis***

Collected data will be entered in MS excel and tables/charts will be generated in MS word. The descriptive data was presented as number and percentages with mean and standard deviations, wherever required.

## RESULTS

This study commenced with 100 women in each group who underwent episiotomy. None of the patients in present study had epidural analgesia for pain relief in labor. In present study, all the episiotomy were performed under local anesthesia in the labor ward.

Descriptive statistics were utilized and all results are presented in terms of percentages. Categorical data were compared using chi square test or Fischer's exact test if appropriate. Statistical significance was $p<0.05$.

In present study, group A 20% were primi and 80% were multigravida while 23% of women were primi and 77% were multigravida in group B. This data shows more of multigravida in both groups when compared to primi gravida.

**Table 1: Association of study group with gravida of study population, (n=200).**

| Gravida | Study group | | Chi square | P value |
|---|---|---|---|---|
| | Group A, N=100 (%) | Group B, N=100 (%) | | |
| **Primi** | 20 (20) | 23 (23) | 0.8350 | 0.3068, NS |
| **Multi** | 80 (80) | 77 (77) | | |
| **Total** | 100 | 100 | | |

NS-not significant.

**Table 2: Statistical analysis of age.**

| Study group | Mean ± SD | Mean difference | 95% CI | | T value | P value |
|---|---|---|---|---|---|---|
| | | | Lower | Upper | | |
| **Group A** | 24.32±3.22 | -0.48 | -1.458 | 0.4985 | 0.9615 | 0.3375, NS |
| **Group B** | 23.84±3.81 | | | | | |

NS-not significant.

The mean age of the patients was 24.32 years in the group A and 23.84 years in the group B. The distribution of women in the age group 21-25 years was relatively higher in both the groups (47% in the group A and 54% in group B). The frequency of the use of suture materials did not differ significantly with regard to age group (p=0.3375).

Of the 200 participants, 78% of patients of group A experienced severe pain whereas only 26% of the group B had severe pain, 74% of the patients of the group B had moderate pain when compared to 22% in the group A. There is a statistical significance ($p<0.0001$) in the degree of pain perception; more in the group A.

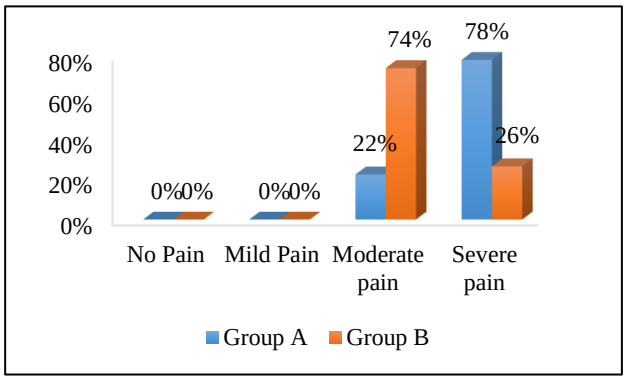


**Figure 1: Association of study group with pain at 48 hours of study population, (N=200).**

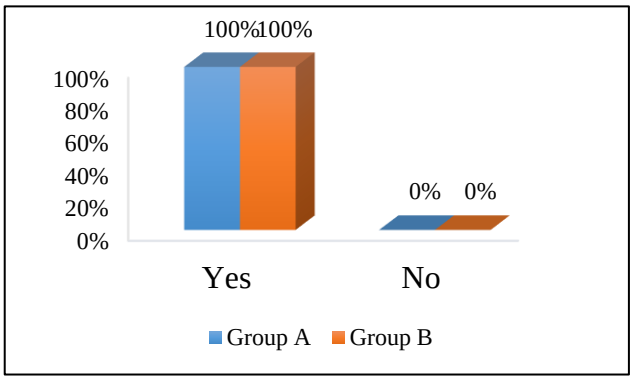


**Figure 2: Need for analgesics at 2 days of study population.**

Analgesic requirement was equal in both the group of patients at 48 hr of episiotomy suturing.

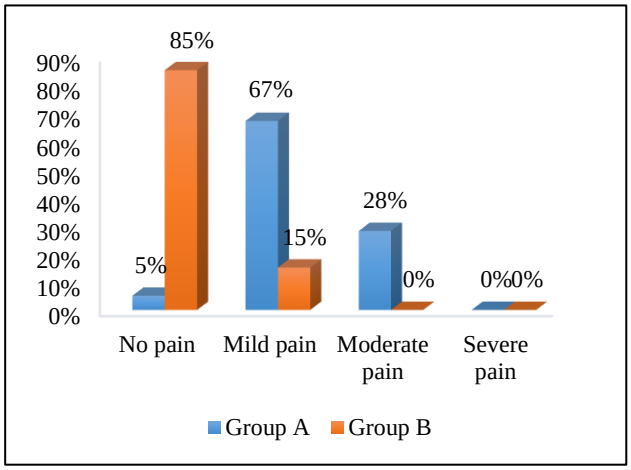


**Figure 3: Association of study group with pain at 7 days of study population.**

On 7th day, 90 (45%) of the patients had no pain, of which 5 (0.05%) belong to group A compared to 85 (94.4%) were in group B. Among the 82 patients who had mild pain, 67 (81.7%) were in the group A and 15 (18.29%) were in the group B. None of the patients in the group B had moderate pain whereas 28 patients in the group A had moderate pain. None of the patients experienced severe pain on 7th day of episiotomy suturing. Hence there is statistically significant reduction in the prevalence of pain in the group B (p<0.0001).

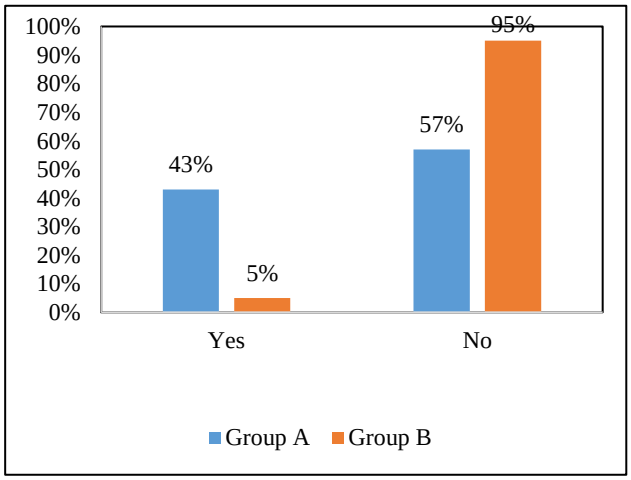


**Figure 4: Need for analgesics at 7 days of study population, (N=200).**

The 43% of the group A required analgesics compared to 5% patients in the group B, who were in need of analgesics. Therefore, the tolerance of pain was found to be better with group B patients as compared to group A.

The 30% of patients in the group A experienced mild pain while no one in the group B experienced even that mild pain at 15th day of episiotomy suturing. None of patients in both the groups experienced moderate to severe pain. Similarly, patients were enquired about pain at 6 weeks, only 6 (6%) of patients had mild pain in chromic catgut group, whereas none in Rapide Vicyrl group. Similarly, 15% of the patients in group A required analgesic, while none of patients in group B required analgesic. Statistically significant correlation was found in study group in terms of pain perception and analgesic requirement (p<0.0001).

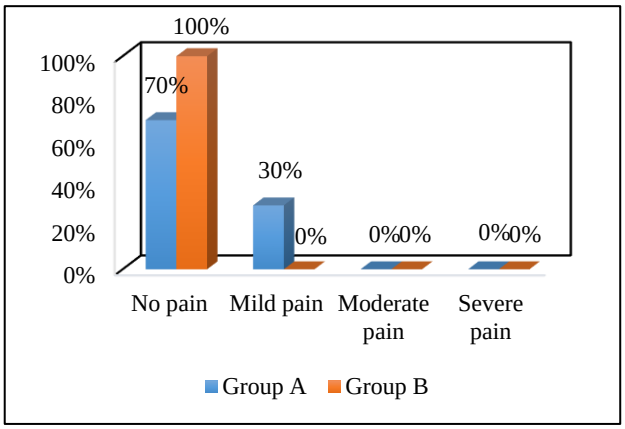


**Figure 5: Pain at 15th day of study population, (N=200).**

**Table 3: Association of study group with wound healing at 15th day.**

| Wound healing at 15th day | Study group, n (%) | | Chi square | P value |
|---|---|---|---|---|
| | Group A | Group B | | |
| **Normal** | 85 (85) | 99 (99) | 5.674 | 0.0172 |
| **Abnormal** | 6 (6) | 1 (1) | | |

Six percentages of the patients in the group A had wound dehiscence compared to 1% in group B. Of the 6 patients in group A, 4 had only skin dehiscence, while the rest required re-suturing, the patient in group B had only skin dehiscence. There is statistical significance in occurrence of wound dehiscence in control group (p<0.05).

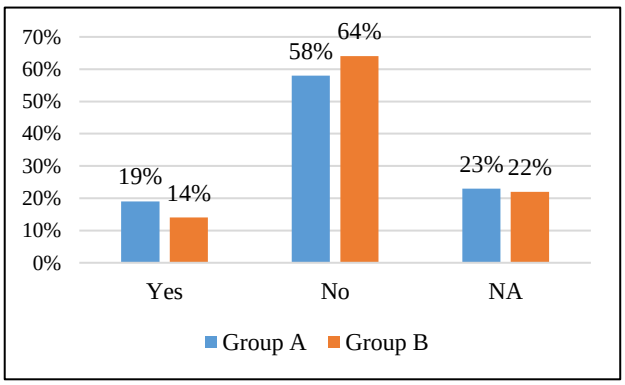


**Figure 6: Association of study group with dyspareunia at 3 months of study population.**

Data could not be collected from 23 and 22 patients of the group A and B respectively. There was no statistically significant difference in the rate of dyspareunia between the two groups (19% vs. 14%).

## DISCUSSION

Because of the high frequency of pain and discomfort felt by women after vaginal birth, identifying even a modest amount of improvement would be important.

### *Parity*

In present study, 21.5% of women who had episiotomy were primi. Both the groups were similar in terms of multi parity, 77% in the group B and 80% in the group A. This is similar to the study by Shah et al which included 226 women in trial.[8] Multi parity rate was 76% in polyglactin and 79% in chromic catgut group in their study.

### *Short term pain*

In the present study, there was significant difference in pain perception at 48 hours postpartum. Analgesic was given to all the subjects. Only 26% of the group B experienced severe pain, compared to 78% of the group A.

Pain started to improve from third day onwards. Only 28% in the group A while, none in the group B experienced moderate pain on day seven. On the 15$^{th}$ day, none of the women in the polyglactin group complained of pain, compared to 30 of the chromic catgut group who experienced mild pain, which was statistically significant.

Women in the polyglactin group reported significantly less pain (26% vs. 78%) as compared to catgut at 48 hr. Analgesic requirement was nil on the 15$^{th}$ day in Rapide Vicryl group whereas 15% of women in the chromic catgut group still required analgesics. This is similar to the study conducted in 150 patients by Joseph et al. [9]

Fewer women in polyglactin (Vicryl Rapide) group experienced short term pain compared to chromic catgut group; results are statistically insignificant ($p>0.05$). From 7$^{th}$ day onwards pain perception was lower in polyglactin group in comparison with chromic catgut group and that was statistically significant. Analgesic requirement was low in the polyglactin group after 7$^{th}$ day and was nil after the 30$^{th}$ day, while 10% of the women in the chromic catgut groups required analgesics even after 30$^{th}$ day.

Masson et al studied the repair of 2000 episiotomies with polyglactin 910 (Vicryl Rapide). There was statistically significant difference in the short-term pain perception.[10]

Mc Elhinney et al recruited 153 women into the study, comparing Vicryl Rapide with Vicryl. No difference in perineal pain was noted between the two groups at 24 hours. The type of suture material used created no difference in pain score even on day three.[11]

Shah et al studied polyglactin 910 with chromic catgut for postpartum episiotomy repair in 226 women. Significantly fewer women of the chromic catgut group reported pain at 48 hours (55.1% vs. 61.1%).[8]

Guideline no. 23 of the Royal college of obstetricians and gynaecologists showed that the absorbable synthetic material for repair of perineal trauma is associated with less short-term pain.[12]

Greenberg et al in their study in 1361 patients, fast-absorbing polyglactin in 459 and chromic catgut in 449 patients were used for perineal repair. At 24-48 hours, subjects in the fast-absorbing polyglactin group showed statistically significant reduction in uterine cramping pain (25% vs. 34%).[4]

Kettle et al reviewed eight randomized trials from the Cochrane pregnancy and childbirth group trails register. Polyglactin group was associated with less pain in first three days compared to catgut group (odds ratio 0.62, confidence interval 0.54 to 0.71).[13]

### *Long term pain (6 weeks)*

Both the group of patients was comfortable without pain at 6 weeks. None of them required analgesics.

Similar, findings were observed by Kurien et al on the 42$^{nd}$ day (100% in polyglactin group vs. 98% in catgut group). Only one (2%) of the patients from the catgut group complained of mild pain.[9]

### *Nature of wound at 6 weeks*

Present study showed a higher incidence of wound dehiscence in the group B compared to the group A (1% of polyglactin group vs. 6% of the catgut group). There is a statistical significance with $p<0.05$.

Of 118 women in the study of Mc Elhinney 0% of patients sutured with polyglactin 910 experienced wound problems like gaping, infection or residual material requiring, compared with 1.7% of chromic catgut patients.[11]

Kurien et al in their study showed no significant difference in wound healing in the three groups.[9]

Cochrane database meta-analysis review by Kettle et al showed more women in the chromic catgut group to have wound dehiscence and required re-suturing than those in the polyglactin and polyglactin (Vicryl Rapide) groups.[15]

Mackrodt et al study revealed that there was no difference in wound healing between the polyglactin and chromic catgut group.[14]

Present study showed statistically significant difference with the use of rapidly absorbing polyglactin in terms of pain relief, analgesic required and wound healing.

***Residual suture at 6 weeks***

Our study showed no residual suture material in either group at the end of 6 weeks. The suture material in the polyglactin (Vicryl Rapide) group was completely absorbed but visible sutures in 28% of polyglactin and 18% of chromic catgut group in the Joseph et al study. [9]

Shah et al in their study reported that more women in the polyglactin 910 group required suture removal than chromic catgut (12% vs. 7%).[8]

Similar, finding like present study was found in the Greenberg et al.[4] There was no difference in residual suture for fast absorbing polyglactin 910 and chromic catgut.

Kettle et al showed that less suture removal was done with the more rapidly absorbed polyglactin than with standard polyglactin (3% vs. 13%).[13]

Our study shows no statistically significant difference between the rapidly absorbed polyglactin and chromic catgut in terms of the need for suture removal.

***Dyspareunia at 3 months***

No statistically significant difference between the two groups was noted in present study.

This is similar to the Cochrane systematic review of eight randomized controlled trials by Kettle and Johanson involving 3642 women. There was no clear difference in terms of long-term pain and dyspareunia in the absorbable synthetic when compared to catgut suture material.[13]

Mackrodt et al and Shah et al also showed no clear difference between the polyglactin 910 and chromic catgut group in terms of dyspareunia or failure to resume pain free intercourse.[8,14]

Mc Elhinney et al in their study showed a statistically significant difference (t=2.440). At twelve weeks only 5% of polyglactin (Vicryl Rapide) patients complained of dyspareunia when compared to 20% of the standard polyglactin group. [11]

In present study there is no significant difference in the rate of dyspareunia with the use of rapidly absorbing polyglactin and chromic catgut.

***Limitations***

Loss of follow up patient and subjective perception of pain of patient.

## CONCLUSION

Fast-absorbing form of polyglactin seems to be effective in reducing some of the morbidity associated with perineal repair following childbirth. There was significant reduction in the short-term pain. There was significant reduction in the need for analgesia. The incidence of wound dehiscence was markedly reduced and hence the need for re-suturing. There was no need for suture removal.

Present study shows the distinct advantage of polyglactin (rapidly absorbable) over chromic catgut, as far as subjective pain perception, analgesic requirement, wound dehiscence and re-suturing are concerned. Hence rapidly absorbable form of polyglactin may be considered in place of traditional chromic catgut for episiotomy in all maternity units.

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