

# A Comparative Study of Vicryl Rapide Versus Chromic Catgut for Episiotomy Repair

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## ABSTRACT

**Introduction:** Episiotomy is surgical enlargement of the vaginal orifice during labour and delivery. It is performed in as many as 62.5% of all vaginal deliveries. Various types of suturing materials are used for perineal wound repair. Absorbable suture materials used are chromic catgut, polyglycolic acid, and polyglactin while non-absorbable sutures are silk, nylon, etc. The suture material ordinarily used is number 1-0 chromic catgut on non-traumatic round-bodied needle. It was planned to perform a study to compare vicryl rapide (VR) suture material with chromic catgut (CC) with respect to pain, swelling, disruption and re-suturing rates. Study aimed to compare the effect of chromic catgut and rapidly absorbable Polyglactin 910 for episiotomy repair with respect to: 1. Pain 2. Swelling and Induration of the wound and wound discharge 3. Wound dehiscence or disruption and; 4. Need for re-suturing.

**Material and methods:** This study was carried out at Department of Obstetrics and Gynaecology at RMCH Bareilly U.P. during November 2017 to October 2018. Study included patients who delivered in the hospital and required episiotomy. It was a randomized controlled study. A total of 100 consecutive cases requiring episiotomy were taken in the study. Randomization was done by even/ odd registration numbers. Eligible and consenting women were assigned to 2 groups. 50 women were included in each group. Group 1 – Polyglactin 910 rapide 2-0 and Group 2 – Chromic catgut 1-0. Inclusion Criteria – primigravida requiring episiotomy and exclusion criteria - premature rupture of membranes, preterm vaginal delivery, history of unclean vaginal examination, diabetes mellitus, twin gestation, operative delivery, manual removal of placenta, vulval hematoma and vaginal tears.

**Results:** The vicryl rapide group experienced less short-term pain, uncomfortable stitches, less analgesic requirement and better wound healing. The wound dehiscence was less with vicryl rapide.

**Conclusion:** This study indicated the clear advantages of vicryl rapide over chromic catgut. Hence, this study recommends the use of vicryl rapide for episiotomy repair in the care of parturient women.

**Keywords:** Episiotomy, Vicryl Rapide, Better Wound Healing

types of episiotomy have been described in the literature, but no standardized practice exists in terms of point of origin, angle of the cut and the length of the incision.<sup>2</sup> The most common types are mediolateral and midline episiotomy incisions. Episiotomy was introduced in obstetric practice to facilitate vaginal births and prevent maternal and fetal complications. Common clinical uses of episiotomy include operative vaginal deliveries (forceps or vacuum), fetal dystocia (breech or face presentation, occiput posterior position), macrosomia (larger than average baby), shoulder dystocia, rigid perineum or threat of severe perineal rupture, maternal exhaustion, or to expedite childbirth in case of suspected fetal compromise (fetal distress, fetal abnormal heart rate). It is performed in as many as 62.5% of all vaginal deliveries of which 70-75% are nulliparous and 25-30% are multiparous subjects.<sup>1,3</sup>

The immediate consequences include blood loss, perineal pain, oedema, infection and hematoma and wound dehiscence. Others include an extension to 3rd or 4th degree lacerations. The long-term complications include the formation of scar tissue, wound infections and dyspareunia. Over the years certain surgical principles have emerged which should be common to all episiotomy techniques in order to ensure an anatomical, functional and pain free type closure. These are

- Adequate exposure and careful attention to the accurate and symmetrical approximation of all tissue layers.
- Hemostasis and avoidance of tissue dead spaces
- Use of absorbable suture material, which is enough to minimize the foreign body reaction but does not cut through the often edematous and friable tissues and;
- Avoidance of large suture bites and of excessive tension.

Various types of suturing materials are used for perineal wound repair. Absorbable suture materials used are chromic catgut, polyglycolic acid, and polyglactin while non-absorbable sutures are silk, nylon, etc. The suture material ordinarily used is number 1-0 chromic catgut on non-

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traumatic round-bodied needle.

Compared to chromic catgut, Vicryl<sup>R</sup> gave better results and showed a significant decrease in perception of pain and analgesia required and also seemed to reduce the need for re-suturing.<sup>4</sup>

Vicryl Rapide<sup>R</sup>, theoretically is the most ideal suture material available at the moment for episiotomy repair.<sup>5</sup> Various trials have been conducted comparing chromic catgut to various other absorbable and non-absorbable suture materials, but no suture material has yet been shown to be convincingly better than chromic catgut.<sup>6-9</sup>

## MATERIAL AND METHODS

This study was randomized prospective study carried out in the Department of Obstetrics and Gynecology at RMCH Bareilly U.P. during November 2017 to October 2018. The permission for the same was obtained from hospital ethical committee, Rohilkhand medical college & Hospital, Bareilly (UP). Written Consent was obtained from all the patients who delivered in our hospital and required episiotomy.

### Sample Size

A total of 100 consecutive cases requiring episiotomy were taken in the study. Randomization was done by even/ odd registration numbers. Eligible and consenting women were assigned to 2 groups. There was 50 women in each group:

- Group 1 – Polyglactin 910 rapide 2 -0 (Vicryl rapide)
- Group 2 – Chromic catgut 1- 0

### Inclusion Criteria

1. Informed consent.
2. Primigravida.

### Exclusion Criteria

1. Premature rupture of membranes.
2. Preterm vaginal delivery.
3. History of unclean vaginal examination.
4. Diabetes mellitus.
5. Twin gestation.
6. Operative delivery.
7. Manual removal of placenta.
8. Vulval hematoma.
9. Vaginal tears.

All episiotomies were medio-lateral in nature. Immediately in the postpartum period, all patients received Cap.Ampicillin 500mg 6 hourly and Tab. Ibuprofen 400 mg 8 hourly as per protocol being followed in R.M.C.H Bareilly U.P.

Patients were not aware of the kind of suture material used. Both groups were compared. Follow up was done till discharge (day 2), at 7 days and 4 weeks postpartum to study the following variables:

- Intensity of perineal pain by visual analogue scale
- Healing status by checking wound inflammation & infection (evidenced by redness, oedema, ecchymosis, wound discharge) and approximation of wound edges.
- Wound dehiscence and need for re-suturing.

### Visual Analogue Scale (VAS)

VAS is a tool to assess pain after painful procedures. According to this scale, the patient's pain score as the most

severe pain as 10 and no pain as zero. This tool is used to measure specifications or attitude towards pain subjectively. The patients were asked to express their postpartum episiotomy pain as a number, and hence represent their status of pain from zero (representing no pain) to 10 (representing the most severe pain). VAS score assessed on day 2, day 7 and at 4th week of postpartum.

### Healing status

Episiotomy healing was assessed among the participants of the study on day 2, day 7 and at 4<sup>th</sup> week.

Inflammatory process and tissue healing assessed, through the five items of healing:

1. Redness (hyperemia)
2. Oedema
3. Ecchymosis
4. Discharge
5. Approximation of the wound edges.

### Compliance with ethical standards

All procedures were followed in accordance with the ethical standards of the responsible committee on human experimentation. Permission was obtained from the scientific and ethical committee of the institution for the study. Informed consent was obtained from all patients for being included in the study.

## STATISTICAL ANALYSIS

The quantitative data was represented as their mean  $\pm$  SD. Categorical and nominal data was expressed in percentage. The t-test was used for analysing quantitative data, or else non parametric data was analysed by Mann Whitney test and categorical data was analyzed by using chi-square test. The significance threshold of "p" value was set at <0.05. All analysis was carried out by using SPSS software version 21.

## RESULTS

A hospital based randomized controlled study was conducted in Department of Obstetrics and Gynaecology at RMCH Bareilly U.P. Study aimed to compare the effect of two different suture materials i.e. chromic catgut and rapidly absorbable Polyglactin 910 for episiotomy repair with respect to: Pain, swelling and Induration, wound dehiscence or disruption and; need for re-suturing.

We included 100 cases requiring episiotomy and randomly assigned them into 2 groups of 50 each: Group 1 –Polyglactin 910 rapide 2 -0 and; Group 2 – Chromic catgut 1- 0 (Table-1). Observations made during the study were:

Most of the females were in between 21-25 years (51%) followed by 26-30 years of age (33%) with no statistical difference between the groups. Mean period of gestation was 37.61 weeks and 37.76 weeks in chromic catgut and vicryl rapide group respectively (p=0.749). Mean VAS Score was higher in chromic catgut group than vicryl rapide group at 48 hours (3.56 vs 2.88) and at 7 days (1.39 vs 0.72). The difference was statistically significant for 7th day score (p<0.01) as shown in table-2.

Additional analgesic at 48 hours was required in 10 cases (20%) and 9 cases (18%) of chromic catgut and vicryl

Group	N	%
Chromic Catgut	50	50.0%
Polyglactin 910	50	50.0%
Total	100	100.0%

Table-1: Distribution of study groups

VAS Score	Group	N	Mean	SD	p- value
48 hours	Chromic Catgut	50	3.56	1.23	0.06
	Polyglactin 910	50	2.88	1.27	
7 days	Chromic Catgut	50	1.39	0.83	<0.05
	Polyglactin 910	50	0.72	0.61	

Table-2: Comparison of mean VAS score among study groups

Wound Infection	Group		Total
	Chromic Catgut	Polyglactin 910	
No	43	48	91
	86.0%	96.0%	91.0%
Yes	7	2	9
	14.0%	4.0%	9.0%
Total	50	50	100
	100.0%	100.0%	100.0%

p- value - 0.15

Table-3: Comparison of study groups as per wound Infection

Inflammation	Group		Total
	Chromic Catgut	Polyglactin 910	
No	43	49	92
	86.0%	98.0%	92.0%
Yes	7	1	8
	14.0%	2.0%	8.0%
Total	50	50	100
	100.0%	100.0%	100.0%

p- value - 0.049

Table-4: Comparison of study groups as per development of inflammation

Wound Dehiscence	Group		Total
	Chromic Catgut	Polyglactin 910	
No	43	49	92
	86.0%	98.0%	92.0%
Yes	7	1	8
	14.0%	2.0%	8.0%
Total	50	50	100
	100.0%	100.0%	100.0%

p- value - 0.049

Table-5: Comparison of study groups as per wound dehiscence

Wound Healing	Group		Total
	Chromic Catgut	Polyglactin 910	
Primary Intention	43	49	92
	86.00%	98.00%	92.00%
Secondary Intention	6	1	7
	12.00%	2.00%	7.00%
Tertiary Intention	1	0	1
	2.00%	0.00%	1.00%
Total	50	50	100
	100.00%	100.00%	100.00%

p- value - 0.049

Table-6: Comparison of study groups as per wound healing

rapide group respectively ( $p=1.0$ ) which was not statistically significant. Additional analgesic at 7 days was required in 12% cases and 0% cases of chromic catgut and vicryl rapide group respectively. The difference was statistically significant ( $p<0.05$ ).

Wound infection was seen in 14% cases of chromic catgut and 4% cases of vicryl rapide ( $p=0.15$ ) which was statistically significant as shown in table-3. Inflammation was seen in 14% cases of chromic catgut and 2% cases of vicryl rapide. The difference was statistically significant ( $p<0.05$ ) as shown in table-4. Wound dehiscence was seen in 14% cases of chromic catgut and 2% cases of vicryl rapide. The difference was statistically significant ( $p<0.05$ ). Wound healing by primary intention was seen in 86% cases of chromic catgut and 98% cases of vicryl rapide. Healing by secondary intention was reported in 14% and 2% cases of chromic catgut and vicryl rapide group respectively. Re-suturing was required in one case of chromic catgut and none of the cases of vicryl rapide group.

## DISCUSSION

The primary function of a suture is to maintain closure of the damaged tissue to promote healing by first intention, control bleeding, and minimize the risk of infection. Perineal trauma that has been carefully sutured generally heals rapidly by primary intention. This is probably because the perineal area immediately after childbirth provides optimal conditions that are necessary for the promotion of quality healing. Commonest suture material used in surgical procedures is CC. Catgut is treated with chromate salt to delay its absorption and decrease inflammatory reactions. CC maintains 60% tensile strength for 7-10 days. On the other hand, VR is a relatively new type of suture. It is designed to give wound support up to 14 days and is totally absorbed by 42 days. A high frequency of pain and discomfort is felt by women after childbirth and identifying even the relatively small improvements would be important to reduce the morbidity. In present study, we aimed to compare the effect of two different suture materials i.e. chromic catgut (CC) and rapidly absorbable Polyglactin 910 (Vicryl Rapide - VR) for episiotomy repair with respect to: pain, swelling and induration, wound dehiscence or disruption and; need for re-suturing.

We included 100 cases requiring episiotomy and randomly assigned them into 2 groups of 50 each: Group 1 – Polyglactin 910 rapide 2-0 and; Group 2 – Chromic catgut 1-0. Both the groups were comparable with respect to baseline variables like age and gestation period.

### Perineal pain

Postpartum pain is one of the agonizing factors for a mother, which has a great impact on the quality of life and on the nursing of the baby. Since Vicryl rapide elicits less inflammatory tissue response than chromic catgut, it reduces the postpartum pain. In present study, Mean VAS Score was higher in chromic catgut group than vicryl rapide group at 48 hours (3.56 vs 2.88;  $p=0.06$ ) and at 7 days (1.39 vs 0.72;  $p<0.001$ ) among patients following episiotomy wound repair in

walking, sitting, and lying posture at 24 h, 48 h, 7 days and 6 weeks postpartum. Bharathi A et al.<sup>9</sup> observed no statistically significant reduction in the pain in the first 24-48 hours. However, only 0.5% of the women complained of perineal pain which required analgesics in the VICRYL RAPIDE group, as compared to 15.5% women in the CHROMIC CATGUT group, which was statistically significant. On the subsequent follow up at 3-5 days (57% vs 32.5%) and at 6 weeks (85.5% vs 79%), the postpartum period showed a statistically significant reduction in the perineal pain in the vicryl rapide group. In another study, Greenberg JA et al.,<sup>10</sup> reported that there was a statistically significant reduction in the pain (25% vs 34%) in the fast-absorbing polyglactin group at 24-48 hours. There were no significant differences between the two groups at 10-14 days. At 6-8 weeks, there was again a statistically significant reduction in the pain (1% vs 4%) and a statistically significant decrease in the analgesic use (5% vs 10%).

### Wound infection

This is a common source of puerperal fever and sepsis, which has significant impact on the maternal mortality and morbidity. In present study, wound infection was seen in 14% cases of chromic catgut and 2% cases of vicryl rapide ( $p=0.15$ ). In the study by Bharti A et al.<sup>9</sup>, a wound discharge was observed in 3.5% of the cases and a wound infection was found in 4% of the cases in the CHROMIC CATGUT group and they were observed in none of the cases in the VICRYL RAPIDE group. This was statistically significant with a p value ( $<0.05$ )

### Swelling or induration

In the present study, inflammation was seen in 14% cases of chromic catgut and 2% cases of vicryl rapide. The difference was statistically significant. A study which was done by Shah PK et al.,<sup>11</sup> reported that a wound swelling was seen in 6.5% cases in the VICRYL RAPIDE group and in 7.6% cases in the CHROMIC CATGUT group in the first 24-48 hours and in 2.8% cases in the VICRYL RAPIDE group and in 3.4% cases in the CHROMIC CATGUT group on the 5th day, which was statistically non-significant.

### Wound dehiscence

Wound dehiscence is one of the important causes of the re-suturing and the hospital admissions in the postpartum period, which has a significant impact on the maternal physical and mental health. In present study, wound dehiscence was seen in 14% cases of chromic catgut and 2% cases of vicryl rapide. The difference was statistically significant. Neha S et al.<sup>12</sup> observed wound dehiscence in 20% and 9.1% of Group CC and VR respectively ( $p$ -value=0.034).

### Wound healing

Wound healing is a naturally occurring process. However, it depends on the types of the suture materials which are used, the presence or absence of an infection, etc. It also has an impact on the quality of life in the form of dyspareunia, incontinence of the bowel and bladder and pelvic floor dysfunction. In present study, wound healing by primary intention was seen in 86% cases of chromic catgut and 98%

cases of vicryl rapide. Healing by secondary intention was reported in 14% and 2% cases of chromic catgut and vicryl rapide group respectively. Resuturing was required in 1 case (2%) of chromic catgut group as compared to none in vicryl rapide group. Grant A et al.<sup>13</sup> reported that the resuturing was less common after the repair in the polyglactin 910 group than in the CHROMIC CATGUT group (2 vs 10 cases).

## CONCLUSION

In this study vicryl rapide, which is used for episiotomy repair, leads to less perineal pain and a better healing as compared to chromic catgut. The vicryl rapide group experienced less short-term pain and uncomfortable stitches and they required less analgesics. The wound healing was more secure with vicryl rapide. The wound dehiscence was less with vicryl rapide. This study indicated the clear advantages of vicryl rapide over chromic catgut. Hence, this study recommends the use of vicryl rapide for episiotomy repair in the care of parturient women.

As this study did not have a long term follow up, the long-term beneficial effects of the type of suture material which was used for the episiotomy repair, cannot be concluded. However, large trials at multicentric studies required to be done to further consolidate these findings.

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