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Original research article

Episiotomy suturing: A randomised controlled study comparing chromic catgut and vicryl rapide and continuous and intermittent suturing

[1]Dr. Nisha Askar, [2]Dr.Aparna Das, [3]Dr. Ravichandran, [4]Dr. Pavithra Eriki

[1, 2, 4]Assistant Professor, Department of Obstetrics and Gynecology, Sri Sathya Sai Medical College and Hospital, Tamil Nadu, India

[3]Assistant Professor, Department of General Surgery, Sri Sathya Sai Medical College and Hospital, Tamil Nadu, India

Corresponding Author:
Dr. Pavithra Eriki

Abstract

Background and objectives: The purpose of this research was to examine the relative efficacy of two suture materials - chromic catgut and vicryl rapide - as well as two episiotomy suturing techniques - continuous versus intermittent. Time for suturing, cut through while suturing, temperature, pain at the episiotomy site, and edoema discharge and dehiscence during wound healing were evaluated.

Method: This study, which ran from October 2021 to October 2022, was a prospective randomised control trial involving 240 patients. Women who gave birth naturally but required an episiotomy were surveyed for this study. They were all patients at the Department of Obstetrics and Gynecology, Sri Sathya Sai Medical College and Hospital, Tamil Nadu, India. All necessary parameters were monitored and written consent was obtained prior to the procedure.

Result: Chromic catgut continuous suturing averaged 19.5±3.19 minutes. Chromic catgut for continuous suturing reduced time (p 0.001). Vicryl rapide-intermittent suturing took 28.4±3.73 seconds to finish. Intermittent and vicryl rapide suturing times differed considerably (p 0.005). Vicryl rapide continuous suturing averaged 21.8 ±3.16. 4.6 vicryl rapide continuous deviated significantly (p 0.001).

Conclusion: Episiotomies should use absorbable sutures. Polyglycolic sutures are better than chromic catgut because they are non-allergic, stronger, less painful, and less infectious. Suturing with catgut isn't optimal. Continuous suturing takes less time, material, knots, and pain than intermittent. Thus, vicryl rapide continuous suturing is better than catgut intermittent suturing for episiotomy wounds.

Keywords: Episiotomy, chromic catgut, vicryl rapide, suturing.

Introduction

An episiotomy, also called a perineotomy, is an incision done over the post vaginal wall/perineum during the second stage of labour to facilitate the passage of the baby with minimal risk of injury to either the mother or the foetus. Although it had been around for a while, it wasn't until Pomeroy's study in 1918 that it was widely accepted by obstetricians. Delee proposed the practise of systematic episiotomy in 1920 as a means to reduce the length of the second stage of labour, protect the health of the fetus's head, shield the perineum from harm, and shield the vesico-vaginal septum from damage [1, 2]. Episiotomy is one of the most frequently performed minor surgeries in most hospitals, despite decades of heated discussion about its necessity. To prevent perineal rips and secondary traumatic PPH from vaginal or cervical lacerations during prolonged straining, our institution promotes the use of episiotomy when necessary. Complete perineal tears from accidental delivery and their complications like faecal incontinence have decreased as routine episiotomies have become the norm [2, 3, 4].

Episiotomies can be performed in four different ways: medially, laterally, laterally, and J-shaped. Due to the increased risk of extension to the anal sphincters and CPT, the median is now rarely used. Without an episiotomy, the risk of anal sphincter injury is about 1%; with a mediolateral episiotomy, it rises to about 9%; and with a median episiotomy, it rises to about 20%. In order to avoid damaging the Bartholin's duct, surgeons rarely choose for the lateral incision, which begins at the fourchette and continues laterally. The mediolateral is currently the most popular, and it is aimed at a 30-45 degree angle from the midline, roughly in the middle of the body between the ischial tuberosity and the anus. The bulbospongiosus, superficial transverse perineii, and deep transverse perineii are the muscles that are divided during an episiotomy. The most common method of incision is a lateral one that avoids the perineal body [5, 6, 7].

Material and Methods

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This prospective randomised control study enrolled 240 patients between October 2021 to October 2022, For this research, questionnaires were sent to women who had a vaginal birth but needed an episiotomy. Everyone there was a patient at the Department of Obstetrics and Gynecology, Sri Sathya Sai Medical College and Hospital, Tamil Nadu, India. Prior to the procedure, all required parameters were monitored and informed written consent was obtained. There were 240 people total, and they were split into four groups at random. Patients were randomly assigned to receive either constant suturing with chromic catgut, constant suturing with vicryl rapide, intermittent suturing with chromic catgut, or intermittent suturing with vicryl rapide.
The study included all women admitted to the hospital between the ages of 18 and 30 who were experiencing labour pains and required an episiotomy. The client gave their written okay.

Severance requirements

1. First-trimester fever
2. A tear in the cervix
3. Episiotomy enlargement
4. Anemia
5. Diabetic coma in pregnancy
6. Extreme pre-eclampsia
7. HIV-positive and Hep-B-positive
8. Outside case management
9. IUD

Women who met the above requirements were randomly divided into two groups and given either a vicryl rapide 2-0 36mm round bodied 1/2 circle or a chromic catgut 1-0 30mm round bodied 1/2 circle to perform the episiotomy. Both the mucosa, muscle, and skin were sutured in a continuous method or with an intermittent suturing technique. Infiltration with 2% lignocaine hydrochloride, a local anaesthetic, preceded all episiotomy repairs. Betadine was used to maintain general asepsis before, during, and after the episiotomy. To avoid any potentially dangerous effects of lignocaine, a test dose was first administered. When the baby's head had crowned and the perineum had thinned sufficiently, an episiotomy was performed. An early episiotomy should be avoided since it can increase bleeding. We make a 4-5 cm mediolateral incision, keeping two fingers' distance between the foetal head and the perineum. Good perineal support and careful delivery of the foetal head are necessary to prevent the need for an extended episiotomy. The perineum is carefully checked for any signs of lacerations, cut extension, or excessive bleeding after the placenta has been delivered [7, 8].
Cut through time with the suture material while biting down was recorded, as was the time it took to complete the suture from the mucosa to the skin. Temperature, discomfort, and wound healing were assessed in the women on days 2 and 7 in the postnatal ward. Both the level of pain and the requirement for pain relievers were recorded using oral analogue scales. Edoema, redness, discharge, and dehiscence were used as indicators of wound healing.

Result

Table 1: Study group and population descriptive analysis (N=120)

Study group	Frequency	Percentage
Chromic catgut	60	50.00%
Vicryl rapide	60	50.00%

Sixty (50%) participants were assigned to the chromic catgut group, while sixty (50%) were assigned to the vicryl rapide group.

Table 2: Gravida in the study population is associated with the research group. (N=120)

Gravida	Study group		Chi square	P-value
	Chromic catgut	Vicryl rapide		
Primi	28 (46.67%)	21 (35%)	2.060a	0.151
Multi	32 (53.33%)	39 (65%)		

Of the 64 Chromic catguts, 32 were Multi (53.33%) and 28 were Primi (46.67%). The vicryl rapide group consisted of 21 (35% Primi) and 39 (65%) Multi. According to the data, neither group had a significantly different gravida% from the other (P = 0.2151).

Table 3: Association between the research group and the population being studied (N=120)

Cut through	Study group		Chi square	P-value
	Chromic catgut (N=60)	Vicryl rapide (N=60)		
Present	3 (5%)	15 (25%)	9.470a	0.002

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Absent	57 (95%)	45 (75%)		

Three pieces of chromic catgut (5% of the total) had been sliced through, whereas 57 pieces (95%) were undamaged. There were 15 cases of cut through (25%) and 45 cases without cut through (75%), respectively, in the vicryl rapide group. There was a statistically significant variation in the proportions of those killed by each group.

Table 4: Connection between the study population and the onset of edoema at day 2 (N=120)

Edema at 2 days	Study group	
	Chromic catgut (N=60)	Vicryl rapide (N=60)
Yes	5 (8.33%)	0 (0%)
No	55 (91.6%)	60 (100%)

*Given that one of the cells included "0" subjects, no statistical test was conducted. 5 people (8.33%) in the Chromic Catgut group experienced Edoema at 2 days.

Table 5: Dehiscence in the research population and its association with the study group at 7 days (N=120)

Dehiscence at 7 days	Study group	
	Chromic catgut(N=60)	Vicryl rapide (N=60)
Yes	7 (11.66%)	0 (0%)
No	53 (88.33%)	60 (100%)

*Despite having a subject count of "0" in one of the cells, no statistical analysis was performed. Seven patients (11.33%) in the chromosomal catgut group experienced dehiscence by day 7.

Table 6: Average suturing times (in minutes) between groups (N=120)

Study group	Time taken for suturing (in min) Mean± STD	Mean difference	95% CI		P value
			Lower	Upper	
Chromic catgut	23.4 ± 5.56	-3.20	-5.35	-1.08	0.003
Vicryl rapide	24.8 ± 5.16				

Suturing took 23.4±5.56 minutes on average in the chromic catgut group and 24.8 ±5.16 minutes on average in the vicryl rapide group. There was a statistically significant split between the two groups (p = 0.003).

Table 7: Group-level descriptive statistics for the sample population (N=120)

Group	Frequency	Percentage
Chromic catgut intermittent	30	25.00%
Chromic catgut continuous	30	25.00%
Vicryl rapide- intermittent	30	25.00%
Vicryl rapide continuous	30	25.00%

There were 30 individuals (25% of the total) with chromic catgut intermittent, 30 individuals (25% of the total) with chromic catgut continuous, 30 individuals (25%) with vicryl rapide-intermittent, and 30 individuals (25%) with vicryl rapide-continuous.

Table 8: Mean ages in the different groups (N = 120)

(I) Group	Mean ± Std. Dev	Mean difference	95% Confidence Interval for Mean		P value
			Lower Bound	Upper Bound	
Chromic catgut intermittent	23.88 ± 3.82				
Chromic catgut continuous	24.08 ± 3.15	-0.21	-2.09	1.68	0.834
vicryl rapide- intermittent	24.5 ± 3.25	-1.12	-3.03	0.78	0.243
vicryl rapide continuous	24.86 ± 3.25	-0.87	-2.79	1.01	0.358

The average age of chromic catgut was 24.08±3.15 years. There was no statistically significant difference in mean age (p = 0.834) between the chromic and catgut continuous ages. Vicryl rapide-intermittent patients had a mean age of 25±3.23 years. There was no statistically significant difference in mean age between -1.12 vicryl rapide-intermittent and 0 years (p = 0.243). Vicryl rapide continuous had a mean age of 24.86±3.25. The statistical significance of the mean difference of -0.87 vicryl rapide continuous was not found (p = 0.358).

Table 9: Second-stage mean times (in minutes) compared between groups. (N=120)

(I) Group	Mean ± Std. Dev	Mean difference	95% Confidence Interval for Mean		P value
			Lower Bound	Upper Bound	

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Chromic catgut intermittent	34.8 ± 9.37				
Chromic catgut continuous	38.6 ±11.55	-3.80	-9.74	2.15	0.206
vicryl rapide- intermittent	37.6 ± 9.6	-2.80	-8.75	3.15	0.351
vicryl rapide continuous	35.8 ± 11.65	-4.00	-9.95	1.94	0.184

The average duration of the second stage of chromic catgut was 38.6±11.55. There was no statistically significant difference in mean age between the two groups, -3.80 chromosomes in continuous catgut (p = 0.206). Vicryl rapide-intermittent had a mean second stage duration of 37.6±9.6 seconds. Not statistically significant (p = 0.351) was the mean age difference of -2.80 years between vicryl rapide and intermittent. Vicryl rapide continuous had a mean second stage duration of 35.8±11.65 seconds. The average second-stage duration across the four groups was similarly close, with a difference of only -4 vicryl rapide continuous (p = 0.184).

Table 10: Average suturing times (in minutes) between groups (N=120)

(I) Group	Mean ± Std. Dev	Mean difference	95% Confidence Interval for Mean		P value
			Lower Bound	Upper Bound	
Chromic catgut intermittent	26.6 ± 4.4				
Chromic catgut continuous	19.5 ± 3.19	8.000	5.96	10.08	<0.001
vicryl rapide- intermittent	28.4 ± 3.73	-3.000	-5.04	-0.97	0.005
vicryl rapide continuous	21.8 ± 3.16	4.600	2.56	6.66	<0.001

Chromic catgut continuous suturing took an average of 19.5±3.19 minutes to complete. Significant (p 0.001) time savings were observed while using chromic catgut for continuous suturing. Vicryl rapide-intermittent suturing resulted in a mean time to completion of 28.4 3.73. Suturing time with vicryl rapide and intermittent suturing differed significantly (p 0.005). Vicryl rapide continuous suturing resulted in a mean value of 21.8 ±3.16. There was a statistically significant deviation of 4.6 vicryl rapide continuous (p 0.001).

Discussion

Episiotomy was debated since the early 1900s, but Pomeroy's 1918 work popularised it. Since then, various studies have examined whether an episiotomy is necessary, and the results show that a restricted episiotomy may be better for tight perineums [9].

After using an episiotomy for a while, the question of whether to use the standard, intermittent three-layer technique or adapt it as a continuous suturing technique for all three layers (mucosa, muscle, skin) arose. The continuous approach outperforms intermittent suturing in most studies. Newer, thinner, monofilament, synthetic absorbable episiotomy sutures began research into the best material. Vicryl was contrasted with chromic catgut. Vicryl had fewer tissue responses, was hydrolyzed, and took longer to absorb, which helped wound healing and reduced infection and postpartum discomfort. Newer materials like vicryl rapide and polyglactin are even more effective than ordinary vicryl. Dexon and episiotomy wound sticky adhesive are the latest experiments. Despite many studies on episiotomy, suturing, and material, most Tamilnadu government institutions still use intermittent suturing and chromic catgut. Thus, our setting and institutions need more studies like this one to improve pain management and wound healing after a simple episiotomy [10, 11].

Our prospective randomised controlled study randomly allocated 240 individuals to one of four groups and examined episiotomy suturing methods and materials across groups. This study is unique in approach and topic matter. Episiotomy and suturing were done in a sterile setting with patient consent. Lignocaine local anaesthetic relieved discomfort. Patients were rechecked on days 2 and 7 postpartum.We found no significant difference in mean age or parity across groups. Contrary to other research, multigravida have needed more episiotomies and suturing than primigravida due to the tight perineum. The P-value demonstrates no statistical difference [12, 13].

The continuous technique reduced suturing time for both catgut and vicryl groups. The two groups' suturing timings differed statistically, with a P-Value of less than 0.001. Intermittent suturing took 29 minutes, while continuous required 21 minutes. Continuous chromic catgut suturing averaged 18.2+3.19 minutes [14].

Chromic catgut continuous suturing took longer (p 0.001). Vicryl rapide-intermittent suturing took 29.2+3.73 seconds. With a p-value of 0.005, vicryl rapide takes 3 seconds longer than intermittent suturing. A continuous vicryl length stitched 21.6+3.14 stitches per inch. 4.6 vicryl rapide continuous deviated significantly (p 0.001). Prior research indicated that continuous suturing took less time. The continuous group consumes less material, suggesting it is more cost-effective. Next, a comparison shows that only one of fifty catgut-sutured patients had a cut through, and it was minor. Cuts required two sutures in 11 of 60 vicryl patients. The studies differed statistically with a 0.002 P-Value [15, 16].

Our cut-through comparison is the first. The only downside of the vicryl rapide suturing group was its cutability. We had to resuture several bleeding spots in delicate vaginas in a few pregnant women. Most

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cut-throughs did not require extra suturing to achieve hemostasis, and wound healing was not affected. After suturing, let's look at day two postpartum outcomes. Pain was the main outcome, and treatment methods and materials differed significantly.

10 women in the chromic catgut intermittent technique group felt pain on day 2 postpartum, compared to 5 in the continuous technique group. At 2 days postpartum, continuous is more comfortable than intermittent. One patient in the intermittent group and none in the continuous group experienced pain with vicryl. The continuous technique causes less discomfort than the intermittent method in multiple trials. From the same, 15 of the 60 catgut-sutured patients had discomfort on the second postoperative day, but just one of the 60 vicryl-sutured patients did. Monofilament vicryl rapide sutures more comfortably than chromic catgut. Comparing the four groups, the vicryl rapide continuous group reduces pain the greatest on the second postnatal day after episiotomy suturing, regardless of material or technique. Related studies are below. Masson *et al*. observed that the polyglactin group had considerably less pain on the second postoperative day (PND) than the other 2000 participants [17, 18].

Shah PK found that 51% of the polyglactin group and 61% of the catgut group had pain on day 2 postnatally in a similar study. In the Ipswich birthing study, polyglactin caused less pain at 48 hours postpartum than absorbable sutures. These studies also compared three-month postpartum dyspareunia rates in the two groups. Studies found no significant difference between the groups. A Cochrane systematic analysis of eight randomised controlled trials including 3642 women by Kettle C and Johanson RB found no significant difference in long-term pain and dyspareunia between absorbable synthetic and catgut suture material [18].

Mackrodt C *et al*. and Shah PK *et al*. found no difference in dyspareunia or incapacity to resume pain-free intercourse between polyglactin 910 and chromic catgut groups. Polyglactin (Vicryl rapide) individuals had 5% dyspareunia at 12 weeks, compared to 20% of the usual group. It was significant ($t = 2.440$). Three out of five chromic intermittent and catgut continuous ladies needed painkillers. No one using vicryl rapide needed painkillers. Two intermittent and one continuous catgut patients developed edoema around the sutured area. One catgut intermittent and one catgut continuous patient had local wound site warmth or temperature. One catgut continuous and one catgut intermittent patient had induration. When all these factors were present, one catgut continuous patient and one intermittent patient had abnormal wound healing. The vicryl rapide group had no wound healing anomalies such edoema, elevated local warmth or temperature, or induration. Vicryl rapide healed all 60 patients by the second postnatal day [19].

These findings support prior evidence showing vicryl rapide heals wounds faster than chromic catgut. A study comparing vicryl to vicryl rapide showed that polyglycolic acid is the best suture material, however it still has difficulties. Coated Vicryl degrades over 30 days, protecting wounds. It's longer than usual, because polyglycolic acid must be removed during the puerperium. This may explain postpartum stiffness and discomfort. We investigated whether moms sutured with Vicryl rapide rather than standard Vicryl had decreased postpartum morbidity. Gemynthe *et al*. compared Vicryl and Vicryl rapide outcomes. At 48 hours, 5 days, and 3 months postpartum, the two groups had similar perineal pain. 14 days after giving birth, Vicryl rapide-sutured perineums caused decreased walking pain. Although not statistically significant, Vicryl-sutured women had a higher rate of having their stitches removed or visible two months after giving birth. Vicryl rapide has no tensile strength after 14 days, but the vicryl group has 50%. This explains the disparities in walking pain [19, 20].

The same measures were collected seven days later in the postnatal ward. The data showed that only 2 of the 30 chromic catgut intermittent patients felt pain, and both of them took analgesics until the 7th PND. 7th PND pain comparison. One catgut intermittent patient showed localised heat, edoema, and induration, as well as aberrant wound healing with wound dehiscence and drainage. He needed resuturing. Her secondary suturing and intravenous antibiotics were planned. The other groups' characteristics and wounds were normal by the seventh day following delivery. We noticed wound dehiscence in our government hospitals' catgut intermittent dressings, therefore we know there are better ways. This suggests that monofilament polyglactin promotes wound healing better than chromic and that intermittent suturing is inferior to continuous. The majority of vicryl rapide (82% of cases) and chromic catgut (71% of cases) wounds were treated to heal. Chromic catgut healed wounds by secondary purpose more than vicryl rapide (3.5%). 2% of chromic catgut and 0% of vicryl rapide cases were tertiary.

Our study found no tertiary wound healing with vicryl rapide. The 2017 Dharmapuri Medical College study comparing catgut to an absorbable synthetic suture material supports our findings. Polyglactin wounds healed faster, with nil or minor wound dehiscence on postoperative day 7. A study in Maharashtra found that continuous suturing was better than intermittent suturing for rural Indians, with 58% reporting pain in the continuous group and 76% in the intermittent group. The continuous group suffered less than the intermittent group. Analgesics helped 68% of continuous suturers and 20% of intermittent suturers. Our findings match [20].

Conclusion

Using absorbable sutures for an episiotomy is a no-brainer. The non-allergic qualities, enhanced tensile strength, decreased discomfort potential, and reduced infection risk of polyglycolic sutures make them

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preferable to chromic catgut. Although it's not ideal, catgut can be used as a suture. In comparison to the intermittent method, the continuous method of suturing requires less time, less material, fewer knots, and consequently less pain. Therefore, we conclude that the continuous suturing technique with vicryl rapide is superior to the intermittent method with catgut for the episiotomy wound.

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Conflict of interest
Nil

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