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## A comparative study between fast absorbing polyglactin 910 vs chromic catgut in episiotomy wound repair

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### Abstract

**Background:** 85% of women delivering vaginally experience perineal trauma, and almost two-thirds require perineal tear repair [1]. Although chromic catgut is used as standard suture, newer materials like Polyglactin 910 question the best available properties [2].

**Methods:** This prospective, comparative study was conducted in Shri BM Patil Medical College, Karnataka from November 2019 to November 2020. 200 women divided randomly into Catgut (group 1) vs Polyglactin (group 2). Results obtained after evaluation at 24-48 hours, 10-14 days and 6-8 weeks postnatally.

**Results:** At 24 to 48hrs postpartum 18% had severe pain in Group 1 whereas 6% in Group 2. Similar trends observed at subsequent follow ups. 54% felt tightness/Uncomfortable in Group 1 and 83% had no such complaints in Group 2 ( $P<0.0001$ ). Wound gaping in Group 1 was 14% vs 4% in Group 1 after 10 to 14 days. However none required resuturing. Residual sutures at 6 weeks postpartum Group 1 vs 2 (0% vs 13%,  $p$  value = 0.002).

**Conclusion:** Fast-absorbing Polyglactin efficient in lessening morbidity such as significant diminution in terms of pain, discomfort, analgesia, wound dehiscence, resuturing. Hence contemplated in place of time honoured chromic catgut traditionally used for perineal repair.

**Keywords:** fast absorbing suture polyglactin 910; chromic catgut; episiotomy wound repair

### 1. Introduction

Since 18<sup>th</sup> century one of the commonest procedure performed in Labour suite by an Obstetrician is Episiotomy. An incision taken on pudendum is called Episiotomy [3]. Important aims of care during delivery are to reduce risk of damage to the perineum; minimize pain and discomfort from perineal sutures [2]. The kind of suture material used for episiotomy can have influence on pain and superficial dyspareunia which women endure in short and medium haul [4]. As a result, finding sutures with the best properties for perineal repair is critical.

Traditionally, these choices have been guided more by habit and expert opinion. For many years, chromic catgut (Fig 1) has remained the standard. With introduction of newer absorbable suture materials raises the question as to whether this standard suture is still appropriate. There are wide variety of absorbable suture materials available which can be used to repair perineal lacerations associated with child-birth.

The fast absorbing variety is standard polyglactin 910 suture material pre-treated with ionizing beams to accelerate hydrolysis. This newer material called fast absorbing Polyglactin (Fig 2) gets absorbed at an average rate of 42 days where as Standard Polyglactin 910 takes 63 days and chromic catgut approximately 90 days [5].

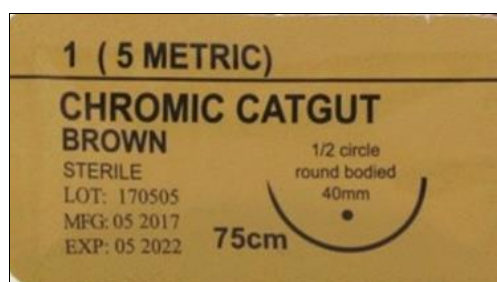


Fig 1: Chromic Catgut No 1

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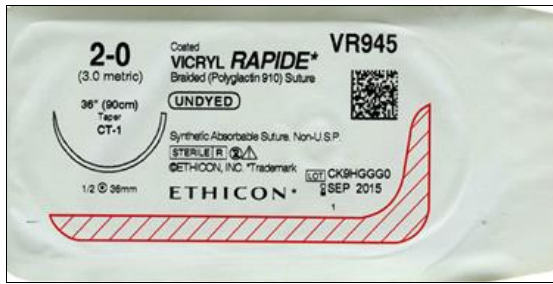


Fig 2: Vicryl Rapide 2-0

Fast absorbing polyglactin 910 sutures (Vicryl-rapide; Ethicon) potentially could offer the short-term benefits of synthetic materials without the problems related to delayed suture reabsorption [6]. Various trails and studies have stated that recently developed fast absorbing polyglactin 910 has properties of synthetic suture material and advantages of rapid absorption as well. However this is not routinely being used. Therefore this study is taken up to compare it with conventional suture used for episiotomy wound in our institution.

The purpose of this research is to evaluate effects of two distinct suture materials, chromic catgut and quickly absorbable polyglactin, on episiotomy healing and postpartum morbidity. The goal of this study was to examine the discomfort, analgesic need, wound dehiscence, removal of remaining sutures, and long-term pain. The primary objective would be to see if synthetic absorbable suture material outperformed natural absorbable suture material in terms of reducing postpartum morbidity after episiotomy or perineal laceration repair.

## 2. Methods

This is a prospective, comparative research included a total of 200 women who had normal vaginal delivery with episiotomy admitted at Shri BM Patil Medical College in labour ward after meeting the inclusion criteria and undertaking informed consent. Two groups of patients were chosen at random with 100 women in each category i.e.

- Chromic catgut-group I
- Polyglactin 910 (Fast-absorbing)-group II

The episiotomy wound was sutured using, either with Polyglactin 910 (fast absorbing) 2-0 or chromic catgut 1-0. The episiotomies were repaired by a standard three- step approach. The vaginal mucosa was sutured by using a continuous interlocking suture and the perineal muscle by intermittent suture. The skin closure was done by using a mattress suture in Group1 whereas subcuticular in Group 2. Both groups were given one shot of antibiotic (ceftriaxone 1gm) before the procedure and analgesics diclofenac sodium or ibuprofen advised to patients after suturing.

The main outcome measures recorded were

**After 24 to 48 hours:** Perineal pain, perineal swelling, tightness of wound

**Days 10 to 14 days:** Pain, wound discharge, wound disruption or dehiscence

**Six weeks postpartum:** Wound healing, removal of unabsorbed

suture

The pain perception was measured by using visual analogue scale (VAS) by using a ruler; the score was determined by measuring the distance (mm) as none, mild, moderate or severe, the following are cut off points on VAS (Fig 3): no pain (0-4 mm), mild pain (5- 44 mm), moderate pain (45-74 mm), and severe pain (75-100 mm).

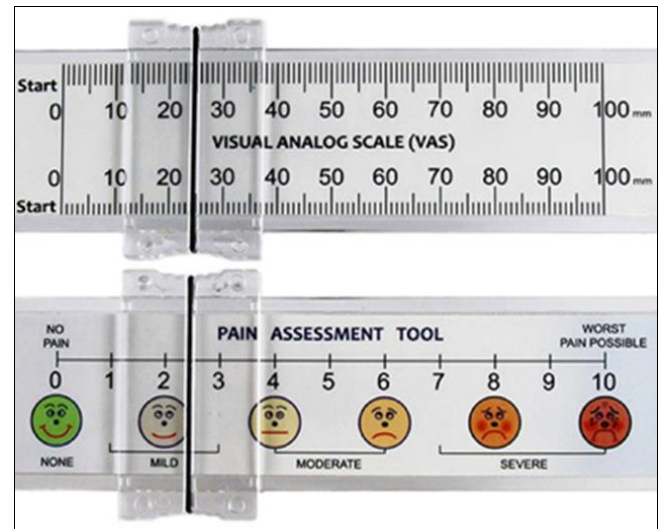


Fig 3: VAS scale for pain

The wound infection was assessed clinically with the following markers: Fever, throbbing pain, swelling and discharge from the wound.

### Inclusion criteria

- All patients with an elective episiotomy
- Second degree perineal laceration

### Exclusion criteria

- Episiotomy incisions extended by instrumental deliveries
- Severe anaemia
- Diabetes
- PROM or PPROM for more than 24 hours
- On steroids or immunosuppressants

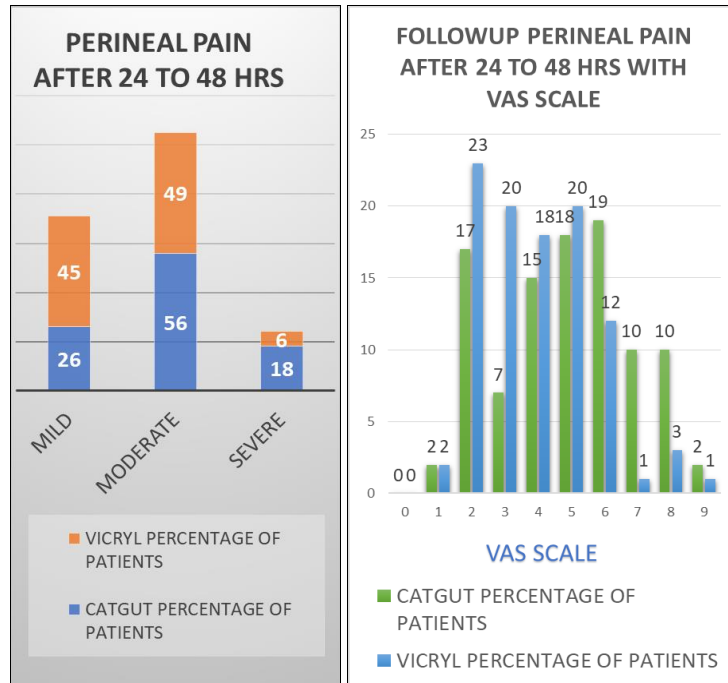
### 2.1 Statistical analysis

All outcomes were represented in percentages and were computed using descriptive statistics. If relevant, categorical data were compared using the Chi Square Test or Fischer's Exact Test. Statistical significance was  $p < 0.05$ . The data were analyzed using SPSS version 18 (SPSS, Chicago, IL, USA).

## 3. Results

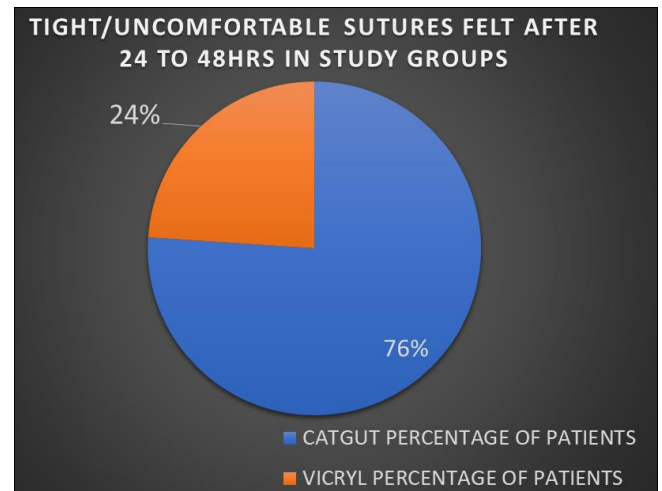
200 women included for the study were allocated randomly to 2 groups – 100 women received chromic catgut No.1-0 and 100 other women received Fast absorbing polyglactin 910 No.2-0 for episiotomy wound repair.

All the subjects were followed post-partum and there was no loss to follow-up.

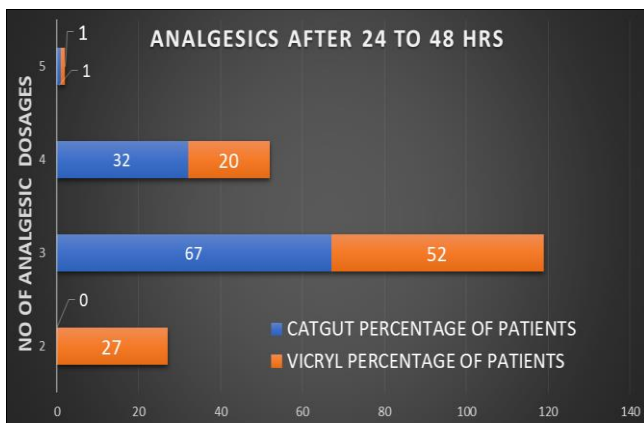


**Graph 1, 2:** Perineal pain after 24 to 48hrs after delivery in study population

After 24 to 48 hrs post-delivery In Group 2 mild and moderate amount of pain perception was as high as 94% compared to Group 1 but the severe grade pain was more in Group 1 as depicted by 6% out of 24% of total severe grade pain in both the groups. (Graph 1 & 2). This was statistically highly significant as  $P = 0.0031$ . This was supported by VAS scale and need for analgesics (Graph 3) as well.

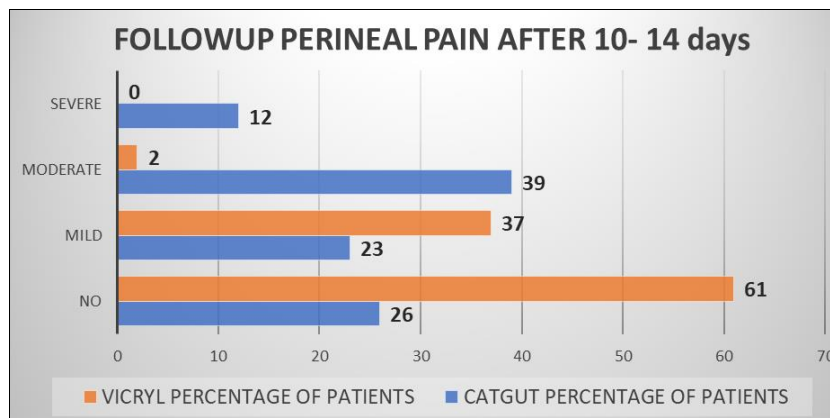


**Graph 4:** Tight/Uncomfortable sutures after 24 to 48 hours postpartum



**Graph 3:** Analgesics after 24 to 48 hours

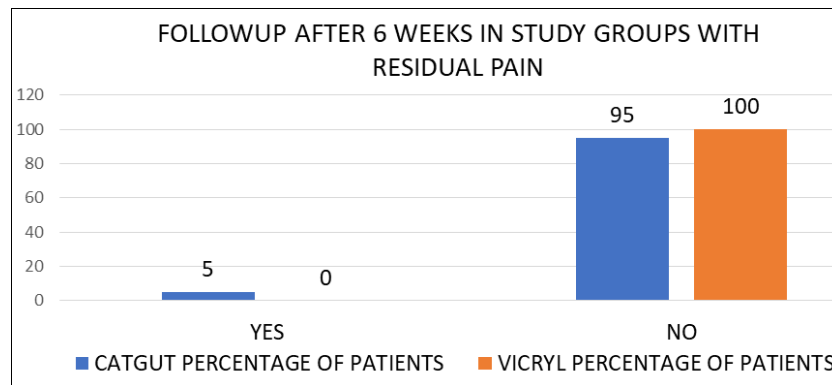
After 24 to 48 hours of following delivery patients were also enquired about discomfort/Tight sutures for which 54% of catgut group gave an affirmative answer while in Vicryl group only 17% patients (Graph 4). This was statistically highly significant as p value is  $<0.0001$ .



**Graph 5:** Perineal pain 10 to 14 days after delivery

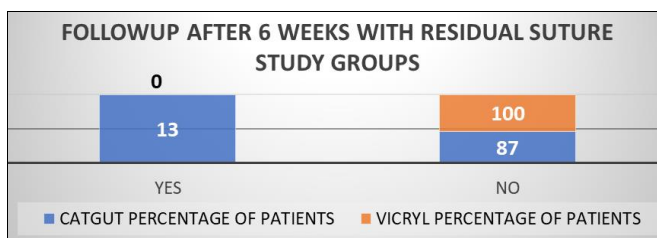
The number of patients who did not experience pain at all at the end of 10 to 14 days post-partum where 26% in group 1 whereas this was high in Group 2 being 61%. In Group 2 mild amount of pain perception was 37% compared to 23% in Group 1 but the

severe grade pain was only in Group 1 as depicted by 12% (Graph 5). This was statistically highly significant as  $P = <0.0001$ .



**Graph 6:** Comparison of residual pain in both groups after 6 weeks post-partum

After 6 weeks postpartum patients in both groups were enquired about residual pain of which only 5% in group 1 had mild pain while in Group 2 none had pain (Graph 6). This was statistically highly significant as p value was 0.0235.



**Graph 7:** Comparison of residual sutures in both groups after 6 weeks post-partum

After 6 weeks postpartum 13% women had residual suture material in Group 1 while none of the women in Group 2 had any residual Vicryl (Graph 7). This was statistically highly significant as p value was 0.002.

#### 4. Discussion

Numerous studies on the use of episiotomy have now been undertaken, with the conclusion that restricted episiotomy in situations of tight perineum may be more useful than standard episiotomy for all individuals [7].

A comparative analysis between chromic catgut which has historically been utilised vs newer absorbable suture material such as polyglactin 910 for episiotomy revealed that vicryl is much less tissue reactive, absorbed via hydrolysis, and took a greater time to absorb, resulting in fewer wound infections, quicker wound healing, and reduced postpartum discomfort. Studies utilising the newer material Dexon and the use of sticky glue for episiotomy wounds are among the most latest [8]. The goal of this study is to provide quantitative evidence to guide the selection of suture material for episiotomy wound repair after vaginal birth.

Pain factor was the largest cumulative parameter investigated, and there was a statistically significant difference in pain across the procedures and suture materials. In the group 1 catgut the closure of mucosa was continuous interlocking followed by muscular layer with intermittent layer which was followed by mattress suture at skin? Unlike in case of group 2 Vicryl the skin layer was closed by continues buried subcutaneous sutures while

the rest of the procedure remained same precendently.

After 24 to 48 hours postpartum vicryl rapid continuous group had significantly lesser pain perception than catgut group, as the same pattern was noticed at 10 to 14 days and 6 weeks follow ups where majority of women had no pain at all in both groups and even of those women who had pain largely belonged to catgut group. This was statistically significant as proved by a more objective VAS scale used at every follow-up and also by the measure of the number of analgesics taken.

When enquired about uncomfortable or tight sutures at perineal site Group 1 had more discomfort than group 2 immediate postpartum at 24 to 48 hours and 10 to 14 days after delivery which was statistically significant.

Masson et colleagues compared pain during the postnatal period in 2000 patients and found a substantial difference in pain in the polyglactin group, with significantly less discomfort [9].

Shah PK investigated the same and discovered that the polyglactin group had 51 percent discomfort on postnatal day 2 compared to 61 percent in the catgut category [10].

The polyglactin group exhibited a clear benefit of reduced discomfort at 48 hours postpartum in Ipswich childbirth trial upon comparing the two suture materials [2].

The Cochrane systematic analysis of eight randomised controlled trials including 3642 women by Kettle C and Johanson RB found no apparent difference between the absorbable synthetic and catgut suture material in terms of long-term discomfort and dyspareunia [1].

Moving onto other comparative parameters like infection none of the women showed any symptoms nor signs of infection after 24-48hrs and also after 10 – 14 days postpartum, but 4% of women in catgut group had mild infection requiring out-patient basis treatment after 6 weeks postpartum. This was statistically highly significant as p value was 0.0434. Yet this was another positive factor favouring vicryl group.

The women were also enquired about wound gaping at every follow-up postpartum. Relatively more women experienced gaping in catgut group 7% over 3% after 24 to 48 hrs, 14% over 4% after 10 – 14 days, 11% over 5% after 6 weeks postpartum but only statistically significant was after 10 – 14 days postpartum. Although none required re-suturing of the gaping. However this was another factor favouring vicryl group.

Although this finding may not be conceptually or statistically significant, clinically, we saw wound dehiscence in just the catgut intermittent group. As catgut is often used in hospitals

perhaps may be considered to be replaced with better choices.

The appearance of wound gaping was not found to be different between the two groups at 24-48 hours in the Ipswich Childbirth trial [10]. Other investigations (Greenberg *et al.*, Leroux *et al.*, Kurian *et al.*) revealed no difference in wound healing at 6 to 8 weeks [5, 6, 11].

After 6 weeks postpartum 13% women had residual catgut sutures at the wound site while none had in vicryl group. This was highly statistically significant as p value was 0.002. In terms of completeness of the wound healing overall 10% women in catgut still had incomplete wound at the end of 6 weeks postpartum whereas only 4% in case of vicryl. The principal purpose of wound healing was evident in 82 percent of vicryl rapide group and 71 percent in chromic catgut group, as shown in a research done in Davanagere.

A study done in 2017 at Dharmapuri Medical College compared catgut with absorbable synthetic suture material and found that the polyglactin group had superior wound healing with nil or zero percent wound dehiscence on PND 7 compared to 15% in the catgut group, which is similar with our study [9].

In a study performed in Maharashtra comparing two methods of suturing and wound repair in India's rural population, the continuous procedure was found to be superior to the intermittent technique, with 58 percent of the continuous suturing group experiencing pain compared to 76 percent of the intermittent group experiencing pain [12].

These findings are consistent with all prior research, which has found that wound healing is better with vicryl rapide than with chromic catgut. Hence monofilament polyglactin is a better alternative for wound healing than chromic catgut suturing.

## 5. Conclusion

Absorbable sutures should evidently be used during episiotomy. Polyglycolic sutures are favoured over chromic catgut sutures because they are non-allergenic, have higher tensile strength, are less likely to cause discomfort and induce infection. Catgut is an option, although it's not the optimum suture material.

Suturing using a continuous method is more optimal and preferable than intermittent suturing since it takes less time, uses less material, has fewer knots, and thus causes less discomfort.

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