



## COMPARISON BETWEEN CHROMIC CATGUT VERSUS FAST ABSORBING POLYGLACTIN 910 FOR REPAIR OF EPISIOTOMY:A PROSPECTIVE STUDY

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**ABSTRACT** **BACKGROUND:** Although the utility of episiotomies in obstetrics is still debatable, when they are performed, they must be repaired with the best suture material and suturing techniques by trained operators. There is no consensus among researchers about the superiority of suture materials. Hence, further interventional researches are required to evaluate and compare the impact of new suture materials. Thus the present study was designed to compare between Chromic Catgut Versus fast absorbing Polyglactin 910 for repair of Episiotomy. **METHOD:** A cross-sectional, prospective, observational study was carried out in department of Obstetrics and Gynecology, Hind Institute of Medical Science, Sitapur on 130 women requiring an episiotomy between January 2021 to July 2022. 130 women were equally divided into Catgut vs Polyglactin group. Results were obtained after assessment at 48 hours, 1 week, 2 weeks and 6 weeks postnatally. **RESULT:** At 48 hrs, the severe pain was in 46.2% patients of Chromic catgut and in 20% of Polyglactin 910. There was significant reduction in short term pain with polyglactin 910. At 6 week no moderate or severe pain was seen in either of the groups except for mild pain was seen in only 3.8% patients of Chromic catgut but none required analgesics. Dyspareunia at 3 months was in 7.3% patients of Chromic catgut and in 4.2% patients of Polyglactin though the results were not statistically significant. **CONCLUSION:** The fast absorbing polyglactin seems to be effective in reducing short term pain associated with episiotomy repair following childbirth. But as the serious problems of wound dehiscence, severe dyspareunia were not more common in either of the groups and also Chromic catgut being less costly and readily available is still found to be an effective suture material for perineal repair without compromising the long term outcomes.

**KEYWORDS :** Episiotomy, Pain, Catgut, Polyglactin 910

### INTRODUCTION

An episiotomy is a surgically planned incision in the perineum and posterior vaginal wall to widen the vaginal opening for birth during the second stage:

- To expand the vaginal introitus in order to enable easy and safe delivery of the fetus, whether spontaneous or manipulative.
- To reduce tension and strain on the fetal head by limiting perineal muscle and fascia overstretching and rupture.<sup>1</sup>
- Although the utility of episiotomies in obstetrics is still debatable, when they are performed, they must be repaired with the best suture material and suturing techniques by trained operators. Which are listed below:
- Chromic catgut: Surgical gut was the first absorbable suture material available. They are monofilament sutures that are biologically absorbable. They are manufactured by twisting pure collagen strands from the sub mucosal layers of sheep's small intestine or the serosal layer of cattle's small intestine together. Chromic salt is used to tanned the chromic catgut.
- Polyglactin 910: Released in 1974, Polyglactin was the second synthetic absorbable suture material available. Polyglactin 910 is a synthetic, absorbable braided suture with calcium stearate and a co-polymer of L-lactide and glycolide. Polyglactin 910 is hydrolyzed in buffer solution and sterilized with gamma irradiation so absorbed rapidly without changing mechanical properties. Polyglactin 910 absorbed by hydrolysis in 7 to 15 days and fall off in 10-14 days.

The immediate complications include blood loss, perineal pain, oedema, infection and hematoma and wound dehiscence. Others complications are extension to 3rd or 4th degree lacerations. The long-term complications include the formation of scar tissue, infection of wound 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 nonabsorbable sutures are silk, nylon, etc. The suture material ordinarily used is number 1-0 chromic catgut on non traumatic round-bodied needle.

Factors like wound healing method, type of suture material used in episiotomy and surgical skills of the surgeon are associated with the rates of episiotomy complications.<sup>2</sup> Chromic catgut and polyglactin 910 are the most common suture materials for the perineal repair. Chromic catgut is treated by chromium salts to delay the absorption time and decrease the inflammatory response in the tissue.<sup>3</sup>

According to previous studies, chromic gut contains collagen and it is broken down by proteolytic enzymes; thus, it stimulates the inflammatory response in the tissue. In contrast, synthetic suture materials such as polyglactin 910 create less inflammatory response, less postpartum pain and relatively rapid wound healing compared with chromic catgut.<sup>4</sup>

Also 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>5</sup> Though few studies showed that with polyglactin 910 a significant decrease in perception of pain and analgesia requirement and it also reduces the need for re-suturing.<sup>6</sup> Polyglactin 910, theoretically is the most ideal suture material available at the moment for episiotomy repair.

Few studies believed that different type of suture materials has no difference in terms of wound dehiscence. Other complications such as pain, wound infections were less prevalent in subjects treated by synthetic suture materials.<sup>7</sup>

Still there is no consensus among researchers about the superiority of suture materials. Hence, further interventional researches are required to evaluate and compare the impact of new suture materials with classical ones and identify the most effective suture materials for perineal repair.<sup>8</sup> Current study was designed to compare between Chromic Catgut Versus Fast absorbing Polyglactin 910 for repair of Episiotomy.

**MATERIAL AND METHOD**

The present cross-sectional, prospective, observational study was carried out in department of Obstetrics and Gynecology, Hind Institute of Medical Science, Mau, Sitapur on a total of 130 women requiring an episiotomy for vaginal delivery and distributed equally into Chromic catgut(groups1) vs Polyglactin 910 (group2).

**RESULT**

The mean age of patients of Chromic catgut and Polyglactin 910 was 24.85±3.57 and 24.75±3.10 years respectively. There was no significant (p>0.05) difference in age of patients between the groups showing the comparability of the groups in terms of age.

Gravida 1 was among more than half of patients in both Chromic catgut (69.2%) and Polyglactin 910 (61.5%) groups. Parity P0 was among majority of patients in both Chromic catgut (80%) and Polyglactin 910 (70.8%) groups. There was no significant (p>0.05) difference in obstetric score of patients between the groups.

The mean gestational age of Chromic catgut group patients and Polyglactin 910 was 38.48±0.95 and 38.43±1.04 weeks respectively. There was no significant (p>0.05) difference in gestational age of patients between the groups.

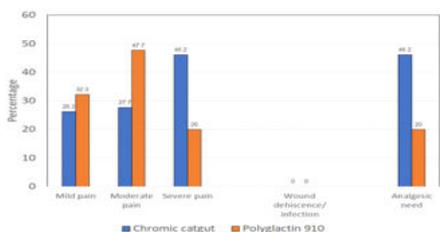
The mean birth weight of babies of Chromic catgut and Polyglactin 910 was 3.03±0.28 and 3.02±0.26 kgs respectively. There was no significant (p>0.05) difference in birth weight of babies between the two groups.

More than half of babies of Chromic catgut (64.6%) and 46.2% of Polyglactin 910 were males. But there was no significant (p>0.05) difference in gender of baby between the 2 groups.

**At 48 hrs :**

Moderate pain was seen in 27.7% patients of Chromic catgut and in 47.7% of Polyglactin 910. The severe pain was in 46.2% patients of Chromic catgut and in 20% of Polyglactin 910. Healthy wound was among all patients in both the groups. The additional analgesic requirement was in 46.2% of Chromic catgut and in 20% of Polyglactin 910 group as shown in Figure1. There was significant (p<0.01) difference in pain and additional analgesic requirement between the groups.

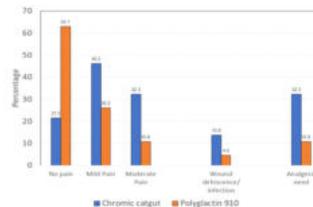
**Figure 1: Comparison of Pain, wound related parameters and additional analgesic requirement at 48 hours between the groups.**



**At 1<sup>st</sup> week:**

Moderate pain was seen in 32.3% patients of Chromic catgut and in 10.8% of Polyglactin 910. Healthy wound was among 86.2% patients of Chromic catgut and in 95.4% of Polyglactin 910. The additional analgesic requirement was seen in 32.3% of Chromic catgut and in 10.8% of Polyglactin 910 group as shown in Figure2. There was significant (p=0.001) difference in pain between the groups

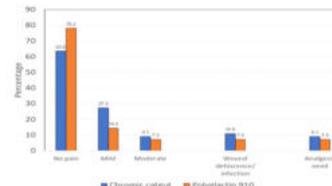
**Figure 2: Comparison of Pain, wound related parameters and analgesic requirement at 1st week between the groups**



**At 2<sup>nd</sup> week :**

Moderate pain was seen in 9.1% patients of Chromic catgut and in 7.3% of Polyglactin 910. Healthy wound was among 89.1% patients of Chromic catgut and in 92.7% of fast absorbing Polyglactin 910. The additional analgesic requirement was in 9.1% of Chromic catgut and in 7.3% of Polyglactin 910 group as shown in Figure3. There was significant (p>0.05) difference in pain, wound dehiscence and analgesic requirement between the groups.

**Figure 3: Comparison of Pain and related parameters at 2nd week between the groups**



**At 6 week:**

Mild pain was seen in 3.8% patients of Chromic catgut only, none of Polyglactin 910 group had pain. Healthy wound was among all patients in both the groups at 6th week as shown in Figure 4. 27 patient didn't turned up at 6 week follow up.

**Figure 4 : Comparison of Pain and related parameters at 6th week between the groups**

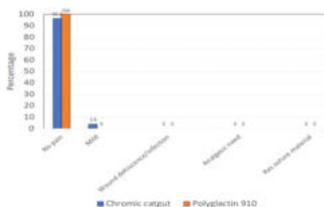
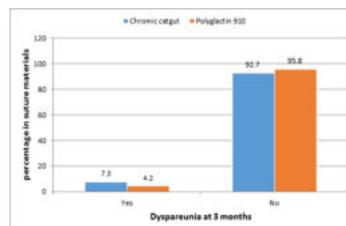


Figure 5 below shows the comparison of dyspareunia at 3 months between the groups. Dyspareunia at 3 months was in 7.3% patients of Chromic catgut and in 4.2% patients of fast absorbing Polyglactin 910. There was no significant (p>0.05) difference in dyspareunia at 3 months between the groups.

**Figure 5: Comparison of Dyspareunia at 3months between the groups**



## DISCUSSION

These decisions have typically been more influenced by habit and professional judgement. Chromic catgut has been the standard for a long time. The question of whether this standard suture is still acceptable has been raised by the development of novel absorbable suture materials. There are several different absorbable suture materials that can be used to treat perineal tears associated with childbirth.

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 gets absorbed at an average rate of 42 days where as Standard Polyglactin 910 takes 63 days and chromic catgut approximately 90 days.<sup>5</sup>

## SHORT TERM PAIN AND REQUIREMENT OF ANALGESICS:

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 current study moderate pain was seen in 27.7% patients of Chromic catgut and in 47.7% of Polyglactin 910 at 48 hours. The severe pain was in 46.2% patients of Chromic catgut and in 20% of Polyglactin 910 at 48 hours. The additional analgesic requirement was in 46.2% of Chromic catgut and in 20% of Polyglactin 910 group at 48 hours.

Results were in accordance with the study of Susmitha J et al.<sup>9</sup> where Polyglactin 910 group showed that mild and moderate amount of pain perception was as high as 94% compared to Chromic catgut-group but the severe grade pain was more in Chromic catgut-group as depicted by 6% out of 24% of total severe grade pain in both the groups.

Perumal D et al.<sup>10</sup> study also showed similar results, 80.2% of the patients of the Polyglactin 910 group had moderate pain when compared to 19.8% in the Chromic catgut group. 80.8% of patients with severe pain were in the Chromic catgut group whereas only 19.2% of the Polyglactin 910 group had severe pain and there was no analgesic required in the Polyglactin 910 group while 80% of the Chromic catgut group was in need of analgesics.

Similar to the results of current study, Singh P et al.<sup>11</sup> also showed that fewer (94.7%) cases of Polyglactin 910 group in comparison to (97.3%) cases of chromyl catgut group required analgesics for pain.

On the contrary study of Shah PK et al.<sup>12</sup> 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%).

Guideline no. 23 of the Royal College of Obstetricians and gynecologists showed that the absorbable synthetic material for repair of perineal trauma is associated with less short term pain and so was seen in the current study.

## LONG TERM PAIN AND ANALGESIC REQUIREMENT:

In the current study no moderate or severe pain was seen in either of the groups and mild pain was seen in only 3.8% patients of Chromic catgut and in 0.0% of Polyglactin 910. None of them required analgesics. Similar findings were observed by Kurien Joseph et al.<sup>13</sup> where on the 42nd day (100% in polyglactin group vs. 98% in chromic catgut group) had no pain.

In accordance to current study<sup>10</sup>, a study showed that number of cases with need of analgesics for pain relief were significantly higher in chromic catgut group than polyglactin group at 6 weeks; the difference was statistically significant ( $p < 0.05$ )

Similar results were also seen in the study of Susmitha J et al.<sup>9</sup> where after 6 weeks postpartum patients in both groups were inquired about residual pain of which only 5% in chromic catgut group had mild pain while in polyglactin 910 group none had pain.

Deshpande et al.<sup>14</sup> reported that use of RAPG-910 required significantly less analgesia as compared to chromic catgut after 1st day, 2nd day, 3rd day, 10th -14th days & 42 days.

## NATURE OF WOUND:

The current study showed that no wound dehiscence was seen among all patients in both the groups at 48 hrs and at the end of 6<sup>th</sup> week but wound dehiscence at 1<sup>st</sup> and 2<sup>nd</sup> week was higher in chromic catgut group than in polyglactin 910 group. Similar results were observed by Perumal D and her colleagues<sup>10</sup> who showed a higher incidence of wound dehiscence in the chromic catgut group compared to the polyglactin group (15% vs. 0%) and it was statistically significant. Similarly Joseph K et al in their study showed no significant difference in wound healing in the two groups.<sup>13</sup>

Cochrane database meta-analysis review by Kettle et al.<sup>15</sup> 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.

## DYSpareunia AT 3 MONTHS:

In the current study dyspareunia at 3 months was in 7.3% patients of Chromic catgut and in 4.2% patients of fast absorbing Polyglactin 910 though the results were not statistically significant quiet similar to the results of Perumal D et al.<sup>10</sup> where there was no significant difference in the rate of dyspareunia with the use of rapidly absorbing polyglactin and chromic catgut. Results were also similar to the Cochrane systematic review of eight randomized controlled trials by Kettle C and Johanson RB involving 3642 women.<sup>16</sup> There was no clear difference in terms of long term pain and dyspareunia in the absorbable synthetic when compared to catgut suture material. Mackrodt C et al.<sup>17</sup> and Shah PK et al.<sup>12</sup> also showed no clear difference between the polyglactin 910 and chromic catgut group in terms of dyspareunia or failure to resume pain free intercourse.

## CONCLUSION

To conclude, overall, fast absorbing polyglactin seems to be effective in reducing short term pain associated with episiotomy repair following childbirth.

There was significant reduction in short term pain and in need of analgesia with polyglactin. Thus in the present study we concluded that fast absorbing polyglactin 910 is associated with less perineal pain and discomfort in the early postpartum period. But as the serious problems of wound dehiscence, severe dyspareunia were not more common in either of the groups and also Chromic catgut being less costly and readily available is still found to be an effective suture material for perineal repair without compromising the long term outcomes.

## REFERENCES

- Dutta DC, DC Dutta text book of obstetrics 9th edition Jaypee - 528-530.
- Kindberg S, Stehouwer M, Hvidman L and Henriksen TB. Postpartum perineal repair performed by midwives: a randomised trial comparing two suture techniques leaving the skin unsutured. BJOG: An International Journal of Obstetrics & Gynaecology 2008;115(4):472-9.
- Perumal D and Selvaraju D. Comparative study of episiotomy repair: Absorbable synthetic versus chromic catgut suture material. International Journal of Reproduction, Contraception, Obstetrics and Gynecology 2017;6(6):2186-90.
- Sohail S, Abbas T and Ata S. Comparison between synthetic vicryl and chromic catgut on perineal repair. Medical Channel 2009;15(2):48-50
- Greenberg JA and Clark RM. Advances in suture material for obstetric and gynecologic surgery. Rev ObstetGynecol2009;2:146-58.
- Parveen FO and Shabbir TE. Perineal repair: comparison of suture materials and suturing techniques. Journal of Surgery Pakistan (International) 2009;14:23-8.
- McKinney ES, James SR, Murray SS, Nelson K and Ashwill J. Maternal-Child Nursing-E-Book: Elsevier Health Sciences; 2017.
- Ziaie T, Porhidary M, Nazifkar H and Kazemnejad E. Comparison of Wound Repair Outcomes of Chromic Catgut versus Vicryl Sutures for Episiotomy Repair: A clinical trial. Advances in Nursing & Midwifery 2016;26(92):1-5.
- Susmitha J and Bidri SR. A comparative study between fast absorbing polyglactin 910 vs chromic catgut in episiotomy wound repair. International Journal of Clinical Obstetrics and Gynaecology 2021; 5(4): 287-291.
- Perumal D and Selvaraju D. Comparative study of episiotomy repair: Absorbable synthetic versus chromic catgut suture material. International Journal of Reproduction, Contraception, Obstetrics and Gynecology 2017;6(6):2186-90.
- Singh P, Soni M and Verma N. A prospective randomized comparative study of rapidly absorbing polyglactin 910 versus chromic catgut for episiotomy repair at tertiary care hospital Bikaner, Rajasthan. Int J Reprod Contracept Obstet Gynecol 2021;10:3445-9.
- Shah PK et al. A randomized comparative study of polyglactin-910 vs chromic catgut for postpartum episiotomy repair: A pilot study. Obstet Gynaecol2001;6(8):465-8.
- Kurian J, Bhaskaran S, Shivaram P. Comparative study of episiotomy repair: Absorbable synthetic versus chromic catgut suture material. J Obstet Gynecol

- India2008;58:495-9.
14. Deshpande H. A Prospective randomized control trial comparing chromic catgut 1-0 versus fast absorbing polyglactin 910 2-0 for episiotomy repair in a semi-urban Indian population group. *Indian J Obstet Gynecol Res*2019;6(1):5-10.
  15. Kettle C, Dowswell T, Ismail KM. Absorbable suture materials for primary repair of episiotomy and second degree tears. *Cochrane Database Syst Rev* 2010; CD000006.
  16. Kettle C, Johanson RB. Absorbable synthetic versus catgut suture material for perineal repair. *Cochrane Database Syst Rev*. 2000;CD 000006.
  17. Mackrodt C et al. The Ipswich Childbirth Study: 2. A randomised comparison of polyglactin 910 with chromic catgut for postpartum perineal repair. *Br J Obstet Gynaecol*1998;105:441-5.