

PERINEAL REPAIR: COMPARISON OF SUTURE MATERIALS AND SUTURING TECHNIQUES

FOUZIA PERVEEN, TEHMINA SHABBIR

ABSTRACT

Objective To compare the outcome of chromic catgut versus polyglactin 910 suture and of continuous versus interrupted suture technique on perineal repair.

Study design Randomized clinical Trial.

Place & Duration of study Darul-Sehat Hospital (a private teaching tertiary care hospital) and the duration of study was 18 months.

Patients and Methods A total of 200 patients delivering singleton fetus and having episiotomy or second degree perineal tear were included in this study. These 200 patients were randomly allocated with alternating sequence to either of the 4 groups which were, group 1 as continuous repair with chromic catgut no. 0 and 00, group 2 as continuous repair with polyglactin 910 no.0 and 00, group 3 as interrupted repair with chromic catgut and group 4 as interrupted repair with polyglactin 910. All the repairs were conducted by authors. Primary outcome was the subjective assessment of perineal pain on day 10, while secondary outcomes were dyspareunia at 6 weeks, resumption of sexual activity, wound healing, residual suture removal and number of sutures utilized. Analysis was performed by SPSS-15 and the ANOVA and Chi-square test were used with p -value < 0.05 as the level of significance.

Results Of the 200 patients 50 patients had perineal repair done with chromic catgut and continuous technique, 50 with polyglactin 910 and continuous technique, 50 with chromic catgut and interrupted method and 50 with polyglactin 910 and interrupted method. At day 10 there was no significant difference (p -value > 0.05) in the pain intensity among different groups. Also there was no difference in dyspareunia, resumption of sexual activity and healing, but more cases of suture removal found in polyglactin 910 group as compared to chromic catgut, while significant difference (p -value < 0.05) was found in the number of suture utilization when compared between continuous and interrupted technique.

Conclusions Chromic catgut is still found to be an effective suture material for perineal repair in resource poor countries as the outcome measures are similar to polyglactin 910. Also the continuous suture technique is found to be less costly as less suture material is required without compromising the outcome.

Key words Perineal repair, Chromic catgut, Polyglactin 910, Suture technique.

Correspondence
Dr. Fouzia Perveen
Darul – Sehat Hospital
Karachi.

INTRODUCTION:

Eighty five percent of women having spontaneous vaginal birth will have some form of perineal trauma, most of which needs repair.¹ It includes episiotomy

which is performed in 32-33% of vaginal births.^{2,3} Morbidity following perineal trauma occurs in up to 60% of women which includes pain, inflammatory changes, dyspareunia and suture removal in the postpartum period.⁴ Pain related to perineal trauma is known to have negative impact on sexual activities in the first year of childbirth. Efforts to reduce morbidity from perineal trauma included, adoption in technique of repair, type of suture material used and the skill of the operator. There is no consensus as to which of the materials and technique of closure should be used for repair although there is an evidence of reduction in short-term pain and dyspareunia with polyglactin 910 sutures as compared to chromic catgut but with an associated increase risk of removal of residual sutures.^{5,6} Similarly continuous method of stitching is recommended by many authors as it reduces overall expenditure since less suturing material is needed, it is less painful and saves time.^{7,8} However clear advantages have not been demonstrated with some of these measures. Grant suggested that the interrupted method is easier than the continuous subcutaneous perineal skin closure to learn and could cause fewer problems for inexperienced operators.⁹ While Flemming reported use of simple non-locking, loose, continuous suturing technique for all layers with subcutaneous stitches. It could be easily taught to inexperienced operators.¹⁰

Being a part of developing country with poor resources and due to increased cost, we are still using chromic catgut for most of the repairs. Despite intensive search on website, we could not find any local study on the topic of effect of suture type and suturing technique on perineal repair while most of the studies are conducted in developed world. This study was aimed to find out the impact of use of chromic catgut versus polyglactin 910 and the continuous versus interrupted suturing technique on the perineal repair.

PATIENTS AND METHODS:

This is a randomized control clinical trial conducted in a tertiary care hospital over a period of 18 months. Patients were recruited and randomly allocated by alternating sequence in either of 4 groups which were as follows. Group 1 having continuous repair with chromic catgut No.0 and 00 (chromic surgical gut suture-Ethicon), Group 2 having continuous repair with polyglactin 910 No.0 and 00 (Vicryl – Ethicon), Group 3 as interrupted repair with chromic catgut No.0 and 00 and Group 4 as interrupted repair with No.0 and 00 polyglactin 910. Inclusion criteria were all primi and multiparous patients who had episiotomy or second degree perineal tear following spontaneous vaginal delivery.

Patients under the age of 18 years, having haemoglobin level <6 g/dl, requiring instrumental delivery, with

preexisting vaginal discharge and coagulation disorders were excluded from the study. Regarding the technique in all groups first stitch was inserted above the apex of vaginal mucosa. In group 1 and 2 mucosa and muscles were sutured with continuous non-locking sutures and subcuticular stitches used for skin, while in group 3 and 4 vaginal mucosa approximated with continuous sutures and muscles and skin with interrupted sutures. All the repairs were carried out by two operators of almost same experience, to avoid the bias of skill of suturing. Those who were lost to follow up for 6 weeks were also excluded. Patients were informed of the suture material that was used. A pre-approved standard prescription was given for postpartum care which included diclofenac 50 mg tablet every 8 hours for 5 days and first generation cephalosporin 500 mg every 8 hours for 5 days.

Data collection included age, parity and gestational age at delivery and number of sutures utilized. At 48 hours, 10 days and 6 weeks postpartum each participant was interviewed regarding pain and discomfort in suture area which were marked as none, or unbearable (which needed additional analgesics). Perineal examination was carried out to find out the healing problems like redness, oedema, haematoma, infection and gaping of wound and the presence of residual sutures. Resumption of sexual activity and dyspareunia was also questioned just after 6 weeks. The principal measures of primary outcome was perineal pain on day 10 and the secondary outcomes were dyspareunia at 6 weeks, resumption of sexual activity, healing, residual sutures removal at 6 weeks and number of packets of sutures used.

Analysis of data was performed with SPSS -15.0. Comparisons between proportions of categorical variables were made using the Chi-square test and Fisher's test (if cell number was < 5). ANOVA was used to compare means of age, parity and gestational age of different groups. Differences were considered statistically significant when the p-value was less than 0.05.

RESULTS:

A total of 200 women were included in this study with 50 in each of the 4 groups after excluding those not fulfilling the inclusion criteria. The demographic data of these 4 groups were comparable at entry in respect to age, parity and gestational age (table-1) with p-value being > 0.05. Majority of patients were primiparous and therefore of younger age but with similar distribution among different groups.

Comparison of suture materials was made between chromic continuous group (group-1) with polyglactin

continuous group (group-2) and the chromic interrupted (group-3) was compared with polyglactin interrupted group (group-4) to find out the effect of type of suture keeping the method of suturing same. So 2 sets of group were compared (table-II) Pain at day 10, the primary endpoint was not significantly different among the group 1 and 2 and the secondary outcomes were also almost similar in both the groups except more (8%) cases of residual suture removal found in polyglactin group as compared to chromic catgut group (2%) but p- value was insignificant. Regarding number of sutures one packet was used in 90% of polyglactin group as compared to chromic catgut group (76%) while the rest of chromic catgut group needed two packets of sutures.

Comparison of chromic catgut interrupted versus polyglactin interrupted revealed pain at day 2 was less in polyglactin group - 14% as compared to 20% while the other outcomes ie. pain at day 10, 6 weeks, dyspareunia and healing were equivocal. Residual suture removal was more in polyglactin group 10% versus 6% but statistically insignificant.

The comparison of suturing techniques is shown in table - III. In continuous method all layers were sutured by non-locking continuous sutures and skin by subcuticular stitch while in interrupted method mucosa sutured continuously and muscles and skin by interrupted sutures. Chromic catgut continuous versus chromic catgut interrupted suturing revealed the primary outcome, pain at day 10 was more in interrupted group (14% versus 8%) but again statistically insignificant (p- value 0.338). Pain at day 2, 6 weeks, dyspareunia and healing were similar. Residual suture removal required more in interrupted technique but statistically insignificant.

Only significant difference (p- value < 0.000) was found in utilization of number of suture packets which was one packet in 76% of continuous group as compared to interrupted group in which 88% needed 2 packets. Comparison of polyglactin continuous versus polyglactin

interrupted group showed pain at day 2 was more in continuous group (18% versus 14%) but on day 10 it was reversed (8% versus 12%) but this has p- value > 0.05 which is insignificant. Pain at 6 weeks, dyspareunia and healing effect were equivocal. Residual suture removal was also similar but number of suture packets were significantly more (p- value 0.000) required in interrupted group (90% needed one packet in continuous group versus 94% required two packets in interrupted group).

DISCUSSION:

The study presented is least likely to be operator skill biased as the repair was conducted by specialists only. Demographic data showed no difference in the distribution regarding age, parity and gestational age is also the strength of the study. Most of the women were primiparous and therefore of younger age as episiotomy was given mostly in primigravidas although a study from JPMC discourages routine use of episiotomy because of increase morbidity.¹¹ Regarding the comparison of suture materials in this study we could not find any significant difference in pain on different days in both chromic catgut and polyglactin groups either sutured by continuous or interrupted methods although pain at day 2 was found in less women in polyglactin interrupted group. This is in contrast to other studies reported in literature. Cochrane systematic review consisting of eight different randomized trials concluded polyglycolic acid sutures are associated with less perineal pain, less need for analgesic use and fewer healing problems in the short term, while long term pain outcomes did not differ substantially.¹²

We have not measured the pain intensity by Visual Analogue Scale or Mc-Gill questionnaire method which is done in most of the studies to quantify the pain which could have unmarked the difference in pain outcomes by avoiding the women's total subjective assessment. Besides in Cochrane review one trial reported more perineal pain and dyspareunia in the polyglactin 910 group at 6 months because of slower absorption of

Variable	Chromic catgut & continuous	Polyglactin 910 & Continuous	Chromic catgut & Interrupted	Polyglactin 910 & Interrupted	P - value
Age (year)	26.64±4.27	25.88±4.62	25.82±4.43	26.26±4.70	0.785
Gastational age (weeks)	38.72±1.34	35.58±1.38	38.62±1.45	38.64±1.38	0.966
Parity (number)	1.58±0.73	1.64±0.72	1.66±0.74	1.74±0.87	0.777

Table – II: Comparison Of Suture Materials				
I	Outcome	Chromic Catgut & Continuous No. (%)	Polyglactin 910 & Continuous No (%)	P - value
	Pain at Day – 2	10(20)	9(18)	0.799
	Pain at Day – 10	4(8)	4(8)	1.000
	Pain at 6 weeks	2(4)	2(4)	1.000
	Dyspareunia	3(6)	3(6)	1.000
	Complete healing	47(94)	47(94)	1.000
	Residual suture	1(2)	4(8)	0.169
	No. of sutures			
	1 Packet	38(76)	45(90)	0.008
	2 Packets	12(24)	5(10)	
II	Outcome	Chromic Catgut & Interrupted No. (%)	Polyglactin 910 & Interrupted No (%)	P - value
	Pain at Day – 2	10(20)	7(14)	0.424
	Pain at Day – 10	7(14)	6(12)	0.766
	Pain at 6 weeks	3(6)	3(6)	1.000
	Dyspareunia	2(4)	3(6)	0.646
	Complete healing	48(96)	48(96)	0.406
	Residual suture	3(6)	5(10)	0.461
	No. of suture			
	1 Packet	6(12)	3(6)	
	2 Packets	44(88)	47(94)	0.326

Table – III: Comparison Of Suture Techniques				
I	Outcome	Chromic Catgut & Continuous No. (%)	Polyglactin 910 & Continuous No (%)	P - value
	Pain at Day – 2	10(20)	10(20)	1.000
	Pain at Day – 10	4(8)	7(14)	0.338
	Pain at 6 weeks	2(4)	3(6)	0.646
	Dyspareunia	3(6)	2(4)	0.646
	Complete healing	47(94)	48(96)	0.504
	Residual suture	1(2)	3(6)	0.307
	No. of sutures			
	1 Packet	38(76)	6(12)	0.000
	2 Packets	12(24)	44(88)	
II	Outcome	Chromic Catgut & Interrupted No. (%)	Polyglactin 910 & Interrupted No (%)	P - value
	Pain at Day – 2	9(18)	7(14)	0.585
	Pain at Day – 10	4(8)	6(12)	0.505
	Pain at 6 weeks	2(4)	3(6)	0.646
	Dyspareunia	3(6)	3(6)	1.000
	Complete healing	47(94)	48(96)	0.286
	Residual suture	4(8)	5(10)	0.727
	No. of suture			
	1 Packet	45(90)	3(6)	
	2 Packets		47(94)	0.000

suture.¹³ Royal college of obstetrics and gynaecology (RCOG) in its guideline also recommended (evidence level A) use of absorbable synthetic material (polyglactin 910) for repair of perineal trauma as it is associated with less perineal pain, analgesic use, dehiscence and resuturing, but at a price of increased suture removal, when compared with catgut.⁵ This need of residual suture removal is consistent with our study. Cochrane systematic review also concluded that length of time for the synthetic material to be absorbed remained of concern.¹³ The presence of residual suture causes discomfort and pain which is seen more in polyglactin group and according to one study 40% needed removal of suture during puerperium because of irritation indicating this is not ideal suture material.⁹ Grant and Kettle and Johanson in their studies reported 40% reduction in short term pain and need for analgesia but need for suture removal was major drawback.^{9,13} The reduction in need for removal of suture material is highly significant if more rapidly absorbed polyglactin 910 or multifilament polyglycolic acid suture is used as evident from other studies.^{6,14}

Chromic catgut suture is reportedly associated with significantly increased painful morbidity and higher incidence of oedema and inflammatory changes compared with polyglactin.¹³ However because of low cost chromic catgut is more readily available and it is likely to be continued as preferred suture material for perineal repair in most poorly resourced settings.⁴ In our study the comparison of continuous and interrupted technique revealed slightly more pain on day 2 in continuous polyglactin suturing which may be due to more tightened stitches resulting in tissue oedema. Pain at day 10 in chromic interrupted group was found to be higher as compared to continuous group. This benefit of continuous technique was consistently found in another study regarding pain associated with daily activities, suture material or skill of operator.⁷

Southmead perineal suture study reported no clear difference in outcome between the policies of subcuticular and interrupted sutures and the explanation given for this was being less practiced method and technically more difficult than the interrupted approach.¹⁵ A systematic review by Viswanathan et al reported two good quality trials with inconsistent evidence that continuous method of repair has less perineal morbidity and more patient satisfaction as compared to interrupted method.¹⁶ RCOG 2004 guideline also given level A gradation to the use of continuous subcuticular technique for perineal skin closure and a loose, continuous non-locking suturing technique to appose vaginal tissue and perineal muscle as it is associated with less short term pain compared with the interrupted method.⁵

A meta-analysis reported in Cochrane database 2008 also claimed less pain up to 10 days postpartum and even greater reduction in pain when continuous suturing techniques were used for all layers.¹⁷ A Polish study also depicted significant advantage of subcuticular suturing both in terms of wound healing and resumption of sexual activity and similar results were reported in many other studies.^{7,18,19}

Significant difference was found in the requirement of suture material as less numbers of sutures utilized in continuous technique as compared to interrupted method (one versus two packets, $p < 0.05$). This is very cost effective especially for resource poor settings as significantly less suturing material required for continuous suturing.^{7,8} The continuous suture technique is also less time consuming as reported in literature.⁸ Cochrane review 2000 suggested continuous technique was associated with less need for the removal of sutures which is also evident from our study in the chromic catgut group.¹² Other studies also drawn similar results regarding the suture removal.^{15,17}

Two important limitations could potentially affect the interpretation of our results which were pain intensity not quantified by scale and small sample number but at the same time it had the strength of excluding the bias of operative skill as most of the studies quoted in literature are heterogeneous in this respect, as the operative skill is one of the factors which affects the repair technique and its results positively. The point estimates desired from this trial do not appear to be in line with major studies in respect to pain but is important in respect to suture removal and numbers of suture utilized.

We conclude that chromic catgut is still an effective suture material for perineal repair in our settings and the continuous technique should be used instead of interrupted method. Indeed, the introduction of continuous suturing policy would overall reduce the expenditure as less suture material is required, it is fast to perform and need of suture removal is also less as compared to interrupted method thus increasing patient satisfaction. Local randomized control trials on large sample should be conducted without operator skill bias to support this study.

REFERENCES:

1. Grant A, Sleep J. Repair of perineal trauma. In: Enkin M, Keirse MJNC, Chalmers I, editors. A guide to effective care in pregnancy and childbirth. Oxford: Oxford University Press;1989: 40-3.

-
2. Martin JA, Hamilton BE, Ventura SJ et al. Births: Final data for 2000. *Natl Vital Stat Rep* 2002;50:1-101.
 3. Ali SS, Malik M, Iqbal J, Faruqi NJ. Routine versus selective episiotomy in primigravidae. *Annals King Edwards Med Coll* 2004;10: 482-84.
 4. Oboro Vo, Tabowei TO, Loto OM, Bosah JO. A multicentre evaluation of the two-layered repair of postpartum perineal trauma. *J Obstet Gynaecol* 2003;23:5-8.
 5. Royal College of Obstetricians and Gynaecologists (RCOG). Method and materials used in perineal rapair. London (UK): Royal College of Obstetricians and Gynaecologists (RCOG); 2004 Guidelines; No. 23.
 6. Upton A, Roberts CL, Ryan M, Faulkner M, Reynolds M, Raynes Greenow C. A randomized trial conducted by midwives, of perineal repairs comparing a polyglycolic suture material and chromic catgut. *Midwifery* 2002;18:223-29.
 7. Kettle C, Hills RK, Jones P, Darby L, Gray R, Johanson R. Continuous versus interrupted perineal repair with standard or rapidly absorbed sutures after spontaneous vaginal birth: a randomized controlled trial. *Lancet* 2002;359: 2217-23.
 8. Kindberg S, Stehouwer M, Hvidman L, Henriksen TB. Postpartum perineal repair performed by midwives : a randomized trial comparing two suture techniques leaving the skin unsutured. *Br J Obstet Gynaecol* 2008;115: 472 – 79.
 9. Grant A. The choice of suture materials and techniques for repair of perineal Trauma: an overview of the evidence from controlled trials. *Br J Obstet Gynaecol* 1989;96:1281- 89.
 10. Flemming N. Can the suturing method make difference in postpartum perineal pain. *J Nurse Midwifery* 1990;4: 65-9.
 11. Javed I, Shoaib T, Bhutta S. Liberal versus restricted use of episiotomy in primigravida. *J Surg Pak* 2007;12:106–9.
 12. Kettle C, Johanson RB. Absorbable synthetic versus catgut suture material for perineal repair. *Cochrane Database Syst Rev* 2000;2:CD 000006.
 13. Kettle C, Johanson RB. Absorbable synthetic versus catgut suture material for perineal repair. (Cochrane Review). In: *The Cochrane library, issue 2.*Oxford: Update Software; 2005.
 14. Dencker A, Lundgren I, Sporrang T. Suturing after childbirth—a randomized controlled study testing a new monofilament material. *Br J Obstet Gynaecol* 2006;113:114-16.
 15. Mahomed A, Grant A, Ashurt H, James D. The Southmead perineal suture study. A randomized comparision of suture materials and suturing techniques for repair of perineal trauma. *Br J Obstet Gynaecol* 1989;96:1272-80.
 16. Viswanathan M, Hartmann K, Palmieri R, Lux L, Swinson T, Lohr KN, Gartlehner G,Thurp J Jr. The use of episiotomy in obstetrical care: A systematic review. Agency for Healthcare Research and Quality Evidence Report 2005; 12:1-8.
 17. Kettle C, Hills RK, Ismail KMK. Continuous versus interrupted sutures for repair of episiotomy or second degree tears. *Cochrane Database of systematic Reviews* 2007;4:CD 000947.
 18. Graczyk S, Limanowski M, Wyduba M. Suture of the episiotomy wound Comparison of techniques from clinical and cosmetic aspects. *Ginekol Pol* 1998; 69:6-11.
 19. Morano S, Mistrangelo E, Pastorino D, Lijoi D, Costantinis S, Raqni N. A randomized comparison of suturing techniques for episiotomy and laceration repair after spontaneous vaginal birth. *J Minim Invasive Gynaecol* 2006;13: 457-62.
-