

Continuous versus Interrupted Suturing in Repair of Lateral and Mediolateral Episiotomy: A Randomized Controlled Trial

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ABSTRACT

Background: Episiotomy is the surgical enlargement of the posterior aspect of the vagina by an incision to the perineum during the last part of the second stage of labor. The incision is performed with scissors or scalpel and is lateral or mediolateral in location.

Aim: This study aims to compare postoperative pain following repair of episiotomy between continuous or interrupted suturing technique.

Methodology: In the second stage of labor, 260 pregnant women received a mediolateral and lateral episiotomy 130 each in Ain Shams University, Maternity Hospital were chosen to participate in the study after obtaining a verbal consent.

They were randomly allocated into two groups A and B, randomization was done using opaque sealed envelopes. Group A: was repaired by interrupted suturing technique and include 130 pregnant women 65 with mediolateral and 65 with lateral episiotomies. Group B: was repaired by continuous suturing technique and include 130 pregnant women 65 with mediolateral and 65 with lateral episiotomies.

Result: This study was carried out on (260) women who were randomly selected to receive a mediolateral or lateral episiotomy in the second stage of labor repaired by either continuous or interrupted suture technique. There was significant difference detected between continuous and interrupted groups as regard pain 6 hours after delivery and dyspareunia. We found that the interrupted group had higher VAS pain score and dyspareunia scale. **Conclusion and Recommendations:** The use of a continuous knotless technique for perineal repair is associated with less perineal pain at 6 hours, less need for analgesia, lower VAS scores, lower dyspareunia scale and less wound complication than interrupted sutures techniques. For that, the introduction of a continuous suturing policy would provide more comfortability, less analgesia, less perineal pain, less dyspareunia and less wound complications are needed for the interrupted method of repair.

Keywords: Episiotomy, perineal pain, dyspareunia.

INTRODUCTION

Episiotomy is the surgical enlargement of the posterior aspect of the vagina by an incision to the perineum during the last part of the second stage of labor. The incision is performed with scissors or scalpel and is typically midline (median) or mediolateral in location⁽¹⁾.

The use of episiotomy decrease trauma to the fetus, decrease the frequency of extensive perineal tears, and protect the soft maternal tissues, yet disagreement persists about its actual effectiveness⁽²⁾.

Episiotomies benefits; include reducing the rate of obstetric anal sphincter injuries (OASIS) and hastening the labour process in cases of fetal distress, this procedure has been considered a necessary constituent of vacuum delivery. However, because of a lack of robust evidence for the value of episiotomy, none of the accepted national guidelines, including those from the American College of Obstetricians and Gynecologists (ACOG), the Council of the Society of Obstetricians and Gynecologists of Canada (SOGC), and the Royal College of Obstetricians and Gynecologists (RCOG), have

included episiotomy as a mandatory step in vacuum delivery. Rather, the guidelines recommend the restrictive use of episiotomy, using the operator's individual judgment. Unfortunately, indications for the selective performance of this procedure are not clearly defined, and episiotomy is still sparingly used during vacuum deliveries in many institutions, up to 100% in certain medical centers (including the first author's department), whereas the avoidance of this procedure has resulted in malpractice litigation⁽³⁾.

Numerous studies have noted that episiotomy use is related to increased rates of several obstetric complications, including urinary and anal sphincter incontinence, and postpartum hemorrhage and pain. Moreover, this procedure can be related to a higher, rather than lower, incidence of advanced perineal tears.⁽³⁾

Episiotomy is incision of the pudenda. The incision may be made in the midline, creating a median or midline episiotomy, or it may begin in the midline but be directed laterally and downward away from the rectum, termed a

mediolateral episiotomy; or start as median one then curve to take a J-shaped episiotomy. ⁽⁴⁾

Perineal trauma is conventionally repaired in three layers. First, a continuous locking stitch is inserted to close the vaginal trauma, commencing above the apex of the wound and finishing at the level of the fourchette with a loop knot. A traditional locking stitch is used to repair the vaginal trauma. Next, the deep and superficial perineal muscles are re-approximated with three or four interrupted sutures, or sometimes a continuous running stitch is used. Finally, the skin is closed using continuous subcutaneous or interrupted sutures. ⁽⁵⁾

Other risk factors include primiparity, fetal birth weight greater than 4000g, instrumental delivery, direct occipitoposterior position and precipitate birth. ⁽⁶⁾ Antenatal perineal massage may reduce the risk of perineal damage. ⁽⁷⁾

In addition, aspects of intrapartum care, such as support during labor, position for delivery, type of pushing, mode of delivery and the use or not of episiotomy, all have a direct effect on both the prevalence and degree of perineal damage sustained during childbirth. ⁽⁸⁾

Obstetricians increasingly face women who wish to have a caesarean section due to fear of genital tract injuries or following previous childbirth-related trauma. ⁽⁹⁾

Complications depend on the severity of perineal trauma and on the effectiveness of treatment. The type of suturing material, the skill of the operator and the technique of repair are the 3 main factors that influence the outcome of perineal repair. Surgical repair of lacerations in the genital area is performed by obstetricians according to extent of trauma. Trauma involving the vaginal mucosa, perineal skin and superficial perineal muscles are defined as first- or second-degree injuries. Lacerations involving the anal sphincter are defined as third degree tears and of the anal mucosa as fourth-degree tears. ⁽¹⁰⁾

Rapidly absorbed synthetic materials are reported to be superior to monofilament sutures and other synthetic products with slower absorption when perineal pain and wound healing are evaluated. ⁽¹¹⁾

Fleming reported her findings after use of a simple, non-locking, loose continuous suturing technique for all layers with subcutaneous stitches placed well below the perineal skin surface. She noted that women reported low levels of pain with the continuous techniques. Results of a systematic review of 4 randomized controlled trials consisting of 1864 primiparous and multiparous women, showed that continuous subcutaneous techniques of perineal skin closure were

associated with less short term pain than interrupted transcutaneous stitches. However, these 4 studies analyzed techniques only for skin closure. The objective of this study is to compare the effects of continuous knotless technique (CKT) for all layers versus interrupted suture (IT) on the amount of short- and long-term postpartum maternal morbidity experienced by laboring women after perineal repair after vaginal delivery ⁽¹²⁾. Dyspareunia is another potential complication of episiotomy. Scarring of the perineum can also be a reason for long-term dyspareunia. The mediolateral episiotomy has been cited more often as a cause, but both approaches can cause discomfort. Robson and Kumar noted soreness and dyspareunia at the episiotomy site in British women; the incidence at 3, 6, and 12 months was 40%, 18%, and 8%, respectively. ⁽¹³⁾ **Ejegard et al.** also found that episiotomy during a first birth was a risk factor for dyspareunia 12–18 months postpartum. ⁽¹⁴⁾

AIM OF THE WORK

This study aims to compare between postoperative pain following repair of episiotomy by continuous or interrupted suturing.

PATIENTS AND METHODS

This study was conducted at Ain-Shams University Maternity Hospital, in the period from March 2016 to March 2017.

The study was approved by the Ethics Board of Ain Shams University.

This study recruited 260 pregnant women fulfilled the inclusion criteria; 236 of them completed all phases of the study. The remaining 24 were dropped out during the follow up.

The inclusion criteria were:

- 1) Primipara.
- 2) Full-term pregnant.
- 3) Subjected to episiotomy when perineal tears were imminent due to fetal macrosomia, congenital fetal malformations as (exophthalmos major, hydrocephalus, spinal cord teratoma), instrumental delivery and preterm onset of labor, rigid perineum or eminent tear **Carroli et al.** ⁽¹⁾

☒ The exclusion criteria were:

- 1) Other techniques of episiotomy.
- 2) Indication for CS e.g.; CPD, malposition and mal-presentation, fetal distress...etc.
- 3) The use of epidural analgesics.
- 4) Factors affecting wound healing e.g.; DM, corticosteroid therapy, chronic debilitating diseases...etc.

- 5) Patients who were developed traumatic injuries other than anal sphincter and rectal mucosal injuries, which were considered secondary outcomes.

Patients were chosen to participate in the study after obtaining a verbal consent.

The randomization was done using computer random sequence generated by excel sheet divided them into equal subgroups.

Allocation concealment: patients fulfilling inclusion and exclusion criteria were allocated into one of the two groups A (interrupted) and B (continuous). Each group was subdivided into two other groups L (lateral) and ML (mediolateral), which was handled to surgeon in theatre just before delivery.

Group A included 130 patients whose episiotomy was repaired by interrupted suture technique. The patients were subdivided into two other groups of 65 patients each: lateral and mediolateral episiotomy.

Group B included 130 patients whose episiotomy was repaired by continuous suture technique. The patients were subdivided into two other groups of 65 patients each: lateral and mediolateral episiotomy.

Patients in both groups A and B underwent the following:

- (1) **History taking:** a full history was taken from the women including:
 - a. Personal history: name, age, parity, address, occupation, telephone number, special habits such as smoking, and husband's name and occupation.
 - b. A complaint: such as labor pain and gush of water per vagina.
 - c. A history of the present pregnancy including date of the last menstrual period (to calculate the gestational age and expected date of delivery), dyspareunia, urinary incontinence, investigations done and drugs received.
 - d. Obstetric history: a history if present of previous pregnancies, pregnancy outcome, abortion, and ectopic pregnancy.
 - e. Past history: medical diseases such as hypertension or diabetes mellitus, and the history of pelvic floor surgery.
 - f. Family history of medical diseases such as hypertension or diabetes mellitus.

- (2) **General examination:** This included vital data: signs of blood pressure, pulse, temperature, height, and weight and body mass index.

- (3) **Abdominal examination:** It involved:
 - a. Abdominal palpation (Leopold Maneuvers) including the fundal level,

fundal grip, and pelvic grip, umbilical grip to assess the fetal lie, presentation and position. Assessment of the head engagement, head above brim, expected fetal weight, monitoring of uterine contraction was also included; and

- b. Auscultation of fetal heart rate.

(4) Local pelvic examination:

- a. Vaginal examination was performed to assess cervical effacement/length (estimate length in centimeters), dilatation (measured dilatation in centimeter), cervical position (stated as either anterior, posterior or midline), consistency (firm, medium, and soft), membranes (intact or ruptured), liquor (clear, blood stained. Meconium staining), presentation (stated as cephalic, breech, cord...), position (record LOA, ROP ...), caput, molding, and station (that was measured in centimeter above (-) or below (+) the ischial spines, example -five, -four, -three, -two, - one, zero (at spines). + one, + two, + three, + four, + five).
- b. All data were documented in a partograph to evaluate the progression of labor through its first stage including also the number of oxytocin units given by intravenous infusion.

(5) Investigations

- a. Routine laboratory investigations: e.g.
 - i. Complete blood count (CBC), a test for anemia, thrombocytopenia, and leukocytosis.
 - ii. Rh type.
 - iii. Urine analysis for protein and preeclampsia.
- b. Abdominal ultrasound for some cases.

Management of the second stage of labor

- Based on the Cochrane Database of Systematic Review, the indication of episiotomy used was rigid perineum or imminent perineal tears.
- When the delivery was eminent (3-4 cm of the presenting part distending the perineum), patients were placed in the lithotomy position and encouraged to bear down during the uterine contractions and to relax in between.
- A care was taken to achieve slow and controlled delivery of the head, maintaining head flexion using (modified Ritgen's maneuver), and delivery of the shoulders one at a time - anterior then the posterior - through lateral flexion of the body.

Technique of the episiotomy:

- When indicated group A containing 130 out of 260 patients was repaired by interrupted episiotomy technique, and group B of 130

patients was repaired by the continuous technique.

- Each group was subdivided into two groups: mediolateral and lateral containing 65 patients each.
- At the time of crowning, the used local anesthetic was 10 cm of lidocaine 1% by infiltration of:
 - Guard with middle and index fingers.
 - A fully inserted needle into perineal tissue at posterior fourchette and directed midway between anus and ischial tuberosity.
 - Injecting 10 ml of lidocaine 1% on slow withdrawal.
- There was an assessment of the whole genital tract for the presence of extended episiotomy, perineal tears and their degree.

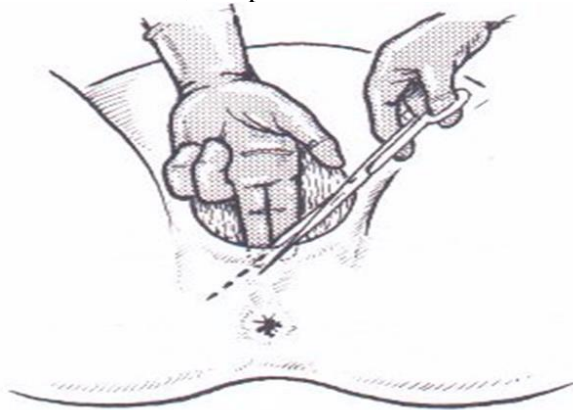
Lateral episiotomy was performed after anesthesia was given. Protecting the fetal head during the procedure. The index and middle fingers were inserted into the vagina between the fetal head and the perineum. This maneuver provided space for making the incision.

An incision was begun one centimeters distant from the center of the posterior fourchette and it was made just before delivery of the fetal head at the time when the perineum was thinned and stretched.

Mediolateral episiotomy: The index and middle fingers were placed into the vagina between the fetal head and the perineum.

An incision was begun at the posterior fourchette and continued downward at an angle of at least 45° relative to the perineal body. The angle of the incision was 90° (perpendicular to the posterior fourchette). The 3-4 cm long incision was performed on the right side.

The anatomic structures involved in a mediolateral episiotomy included the vaginal epithelium, transverse perineal muscle, bulbocavernosus muscle, and perineal skin.



Mediolateral episiotomy

- The suture material used in the study was EGYSORB (sterile coated synthetic

polyglycolic acid absorbable braided suture) No 2/0, Manufacturer TAISIER-MED Company).

- Each patient received 1 gm of second generation cephalosporin during the second stage of labor.
- The Episiotomy in group A was done using the interrupted suture (IT) which involved placing three layers of sutures. A continuous non-locking stitch to close the vaginal epithelium was commenced above the apex of the wound and finished at the level of the fourchette. Three or four interrupted sutures were done to reapproximate the deep and superficial perineal muscles, and interrupted transcutaneous technique was also performed to close the skin.
- The Episiotomy in group B was done using the continuous knotless suturing technique (CKT) which involved placing the first stitch above the apex of vaginal trauma to secure any bleeding points that might not be visible. Vaginal wound, perineal muscles (deep and superficial), and skin were reapproximated by a loose, continuous, non-locking technique. Skin sutures were placed closely, fairly and deeply in the subcutaneous tissue; reversed back and finished with a terminal knot placed in the vagina beyond the hymeneal remnants.
- Subgroups were subjected to Mediolateral episiotomy; it was defined as an incision beginning in the midline and directed laterally and downwards away from the rectum. The incision was usually about four centimeters long. In addition to the skin and subcutaneous tissues, the bulbocavernosus, transverse perineal, and puborectalis muscles were cut.
- Lateral episiotomy began in the vaginal introitus 1 or 2 cm lateral to the midline and was directed downwards towards the ischial tuberosity.

Measurement of Outcomes

Patients were followed up:

All patients were observed for 6 hours after delivery for need of analgesia and perineal pain. All patients were asked to return for follow up after seven to ten days from delivery for wound healing and infection.

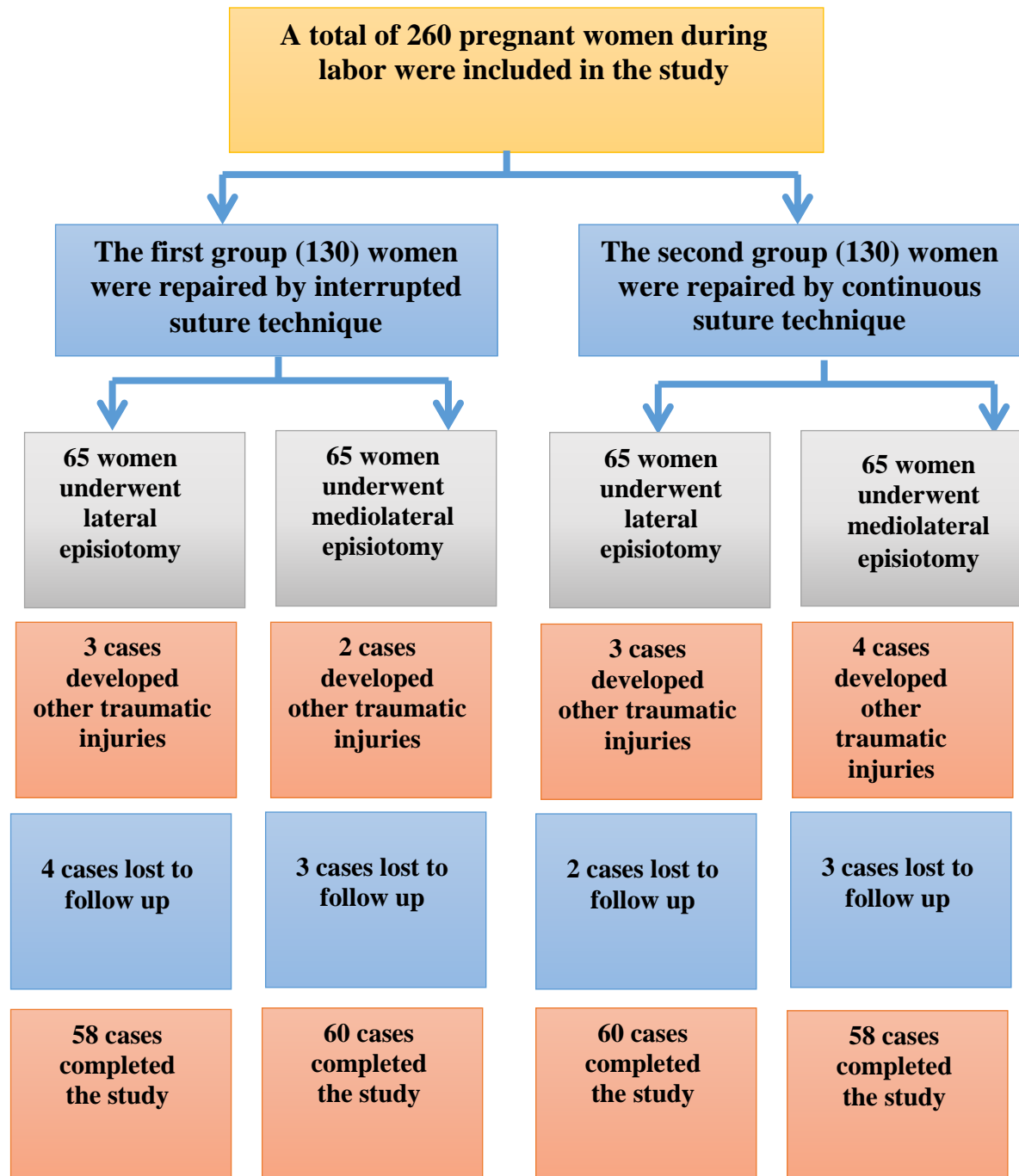
Full personal data were recorded and the patients were followed up by telephone call and were asked to return three months after delivery for assessing dyspareunia according to Marinoff dyspareunia scale.

- **Primary outcome:**

1. Perineal pain was measured by visual analogue scale (VAS).
2. The need for analgesia after delivery till discharge of hospital.

- **Secondary outcome:**

1. Early complication of episiotomy e.g.; anal sphincter injury and rectal mucosal injury.
2. Wound dehiscence and hematoma. The need for suture removal.
3. Wound infection was diagnosed by symptoms such as pain, fever and abnormal discharge from the wound and examined for persistent hyperemia in duration, tenderness of the wound and possibly purulent discharge or gapping.
4. Dyspareunia up to three months after delivery according to Marinoff dyspareunia scale:
 - 0 = no dyspareunia;
 - 1 = causes discomfort, but does not interfere with the frequency of intercourse;
 - 2 = sometimes prevents intercourse; and
 - 3 = completely prevents intercourse.



Statistical Analysis

Data analysis was done by IBM computer using SPSS (statistical program for social science version 12) as follows:

I. Descriptive statistics

- a. Mean (X).
- b. Standard deviation (SD).
- c. Number and percentage for qualitative data.

II. Analytical statistics

- a. Student's t-test was used to assess the statistical significance of the difference between two population means in a study involving independent samples.
- b. Chi-Square test (X²) was used to test the association variables for categorical data.
- c. Pearson correlation analysis assessing the strength of association between two

variables. The correlation coefficient, denoted symbolically by r, defines the strength and direction of the linear relationship between two variables.

- d. The level of p-value: the level of significance was considered according to p-value.

I. p>0.05 = Non-significant (NS)

II. p<0.05 = Significant (S)

III. p<0.01 = highly significant (HS)

RESULTS

This study was carried out on (260) women who were randomly selected to receive a mediolateral or lateral episiotomy in the second stage of labor repaired by either continuous or interrupted suture technique.

Table (1): A Comparison between continuous and interrupted suture technique, and mediolateral and lateral episiotomy as regards number of cases

Type of episiotomy suture technique	Lateral	Mediolateral	
Continuous	65	65	130
Interrupted	65	65	130
Total	130	130	260

Table 1 shows the number of continuous and interrupted suture technique, and mediolateral and lateral episiotomy with regard to number of cases.

Group A, containing 130 women, was repaired by interrupted suture technique and included patients who were subdivided into either lateral or mediolateral episiotomy groups of 65 patients in each.

Group B, containing 130 women, was repaired by continuous suture technique and included patients who were subdivided into either lateral or mediolateral episiotomy groups of 65 patient in each.

Table (2): Description of age, gestational age, height, weight and BMI of studied group

	Mean ± SD	Min.	Max.
Age	22.6±2.9	18	31
Gestational age	38.2±2.1	8	40
Weight	77.2±10.0	55	101
Height	157.2±4.3	150	177
BMI	28.2±2.2	20.7	36.0
	Normal	25 (10.6%)	
	Overweight	183 (77.5%)	
	Obesity grade I	28 (11.9%)	

This table showed that the mean age of studied group was 22.6±2.9, mean gestational age of women was 38.2±2.1, mean weight was 77.2±10.0, mean height was 157.2±4.3 and the mean BMI was 28.2±2.2 with majority of overweight 77.5%.

Table (3): Description of type of episiotomy, method of repair and pain score 6 hours after episiotomy of studied population

		N.=260	Percent (%)
Type of episiotomy	Lateral	130	50.0
	Medio-lateral	130	50.0
Method of repair	Continuous	130	50.0
	Interrupted	130	50.0
pain score after episiotomy (Mean ± SD)		5.3±1.7 (1-8)	

This table showed that the number of women repaired by continuous was 130 women and by interrupted was 130 women. Lateral episiotomy was done in 130 women and mediolateral episiotomy in 130 women. Just 118 of each group completed the study. The mean pain score on VAS was 5.3±1.7.

Table (4): Prevalence of Need of analgesia, wound infection and dehiscence and fourth degree perineal tears of studied population

		N=236	Percent (%)
Need of analgesia	No	171	72.5
	Yes	65	27.5
Wound infection	No	164	69.5
	Yes	72	30.5
Wound dehiscence	No	164	69.5
	Yes	72	30.5

This table showed that the 27.5 % of the studied group need analgesia after episiotomy and 30.5 % of the studied group had wound complication after episiotomy. The patient who developed fourth degree perineal tear were only two cases one in interrupted group and the other one in continuous group.

Table (5): Comparison of VAS pain score after 6 hours between different type of episiotomy and different methods of repair of studied group

		Pain score after episiotomy			t	P value	Sig.
		N	Mean	SD			
Type of episiotomy	Lateral	118	4.58	1.355	-7.159	0.001	HS
	Medio-lateral	118	6.03	1.732			
Method of repair	Continuous	118	4.50	1.206	-8.256	0.001	HS
	Interrupted	118	6.12	1.767			

This table showed that the VAS pain score was higher in mediolateral episiotomy than lateral episiotomy with high significant (p value= 0.001).

The VAS pain score was higher in interrupted than continuous suture technique with high significance (p value= 0.001).

Table (6): Comparison of need of analgesia, wound infection and dehiscence fourth degree perineal tears in different types of episiotomy of studied population

		Technique of episiotomy		X ²	P value	Sig.
		Lateral (N=118)	Medio-lateral (N=118)			
Need of analgesia	No	N	85	0.021	0.884	NS
		%	72.0%			
	Yes	N	33			
		%	28.0%			
Wound infection	No	N	76	2.878	0.090	NS
		%	64.4%			
	Yes	N	42			
		%	35.6%			
Wound dehiscence	No	N	74	5.117	0.024	S
		%	62.7%			
	Yes	N	44			
		%	37.3%			

There was no significant difference between lateral and mediolateral episiotomy in the need of analgesia and wound infection. But there was a significant difference between two types of episiotomy as regard wound dehiscence it was higher in lateral than mediolateral episiotomy (p value= 0.024).

The patient who developed fourth degree perineal tear were only two cases one in interrupted group and the other one in continuous group.

Table (7): Comparison of Need of analgesia, Wound infection and dehiscence in different Methods of repair of studied population

			Method of repair		X ²	P value	Sig.
			Continuous (N=118)	Interrupted (N=118)			
Need of analgesia	No	N	91	80	1.937	0.164	NS
		%	76.5%	68.4%			
	Yes	N	28	37			
		%	23.5%	31.6%			
Wound infection	No	N	84	80	0.136	0.712	NS
		%	70.6%	68.4%			
	YES	N	35	37			
		%	29.4%	31.6%			
Wound dehiscence	NO	N	85	79	0.425	0.515	NS
		%	71.4%	67.5%			
	YES	N	34	38			
		%	28.6%	32.5%			

There were no significant difference between suture techniques as regard need of analgesia, wound infection and dehiscence (p value= 0.164, 0.712, 0.515) respectively.

Table (8): Description of Dyspareunia 3 months after delivery of studied population

		N. =236	Percent (%)
Dyspareunia Marinoff scale	No dyspareunia	6	2.5
	Discomfort not interfering with intercourse	182	77.1
	Sometimes prevents intercourse	46	19.5
	Completely prevents intercourse	2	0.8

In Marinoff scale of dyspareunia the majority of women complained of discomfort not interfering with intercourse.

Table (9): comparison of Dyspareunia Marinoff scale in different types of episiotomy of studied population

			Technique of episiotomy		X ²	P value	Sig.
			Lateral (N=118)	Medio-lateral (N=118)			
Dyspareunia Marinoff scale	No dyspareunia	N	6	0	7.996	0.030	S
		%	5.1%	0.0%			
	Discomfort not interfering with intercourse	N	88	94			
		%	74.6%	79.7%			
	Sometimes prevents intercourse	N	24	22			
		%	20.3%	18.6%			
	Completely prevents intercourse	N	0	2			
		%	0.0%	1.7%			

This table showed that dyspareunia was higher in mediolateral episiotomy than lateral episiotomy and the difference between them was significant (p value= 0.03). According to Marinoff scale the majority of women complained of discomfort not interfering with intercourse which was higher in mediolateral than lateral episiotomy (79.7% vs 74.6%).

Table (10): Correlation of factors associated with pain score after 6 hours

		Pain score after episiotomy
Age	Pearson Correlation	-0.068
	P value	0.298
	Sig.	NS
Weeks	Pearson Correlation	0.038
	P value	0.563
	Sig.	NS
Weight	Pearson Correlation	-0.038
	P value	0.559
	Sig.	NS
Height	Pearson Correlation	-.141
	P value	0.030
	Sig.	S
BMI	Pearson Correlation	-.249
	P value	0.000
	Sig.	HS

This table showed that the age, weeks and weight had no correlation with pain score. There was no significant difference. The height had a negative correlation with pain score. There was a significant difference. The BMI had a negative correlation with pain score. There was a high significant difference.

Table (11): Comparison of Dyspareunia Marinoff scale in different methods of repair of studied population

			Method of repair		X ²	P value	Sig.
			Continuous (N=118)	Interrupted (N=118)			
Dyspareunia Marinoff scale	No dyspareunia	N	6	0	14.455	0.001	HS
		%	5.0%	0.0%			
	Discomfort not interfering with intercourse	N	98	84			
		%	82.4%	71.8%			
	Sometimes prevents intercourse	N	14	32			
		%	11.8%	27.4%			
	Completely prevents intercourse	N	0	2			
		%	0.8%	0.9%			

This table showed that there was a highly significant difference between two suture techniques as regard dyspareunia which was higher in interrupted than continuous technique (p value= 0.001). According to Marinoff scale the majority of women complained of discomfort not interfering with intercourse which was higher in continuous than interrupted suture technique (82.4% vs 71.8%) but in dyspareunia sometimes and completely prevent intercourse it was higher in interrupted than continuous suture technique.

This figure showed that the highest pain score was in interrupted-mediolateral group (mean = 7.6) and lowest in continuous-lateral group (mean = 4.4).

Table (12): Post Hoc analysis of pain score

Dependent Variable	(I) Subgroups	(J) Subgroups	Mean Difference (I-J)	P value
Pain score after 6 hours after episiotomy	Continuous-Lateral	Continuous-Mediolateral	-0.109	0.599
		Interrupted-Lateral	-0.271	0.195
		Interrupted-Mediolateral	-3.111(*)	0.001
	Continuous-Mediolateral	Interrupted-Lateral	-0.162	0.437
		Interrupted-Mediolateral	-3.002(*)	0.001
	Interrupted-Lateral	Interrupted-Mediolateral	-2.840(*)	0.001

This table showed that the comparison of pain score between each subgroup to each other. The continuous-lateral had a lowest pain score compared to other three groups. Then pain score increase gradually in continuous mediolateral then interrupted lateral and it was highest in interrupted mediolateral. There was a significant difference.

Table (13): Multivariable regression analysis of the relation between suturing technique or type of episiotomy and pain score 6 hours after episiotomy using VAS adjusted for age, BMI and gestational age

Variable	Coefficient	SE	r(partial)	t	p-value
Constant	3.474				
Interrupted suturing†	1.677	0.170	0.545	9.852	<0.0001
Mediolateral episiotomy‡	1.872	0.189	0.547	9.898	<0.0001
Age (years)	0.032	0.029	0.072	1.098	0.273
BMI (kg/m ²)	-0.100	0.021	-0.301	-4.789	<0.0001
Gestational age (weeks)	0.064	0.133	0.032	0.483	0.630

SE = standard error, r (partial) = partial correlation coefficient, t = t statistic.

†refers to continuous suturing.

‡Refers to lateral episiotomy.

This table showed the results of multivariable regression analysis of the relation between suturing technique or type of episiotomy and pain score 6 hours after episiotomy using VAS adjusted for the age, BMI and gestational age. After adjusting for the other variables, an interrupted suturing technique was an independent predictor of the pain score, which means that while neutralizing the other factors to just measure suture techniques, we found that the interrupted technique had a higher pain score.

After adjusting for the other variables, a mediolateral type of episiotomy was an independent predictor of the pain score. Meaning, while neutralizing the other factors to just measure type of episiotomy, we found that the mediolateral type had a higher pain score.

Table (14): Multivariable binary logistic regression analysis of the relation between suturing technique or type of episiotomy and the occurrence of dyspareunia 3 months after episiotomy interfering with intercourse as adjusted for age, BMI, and gestational age

Variable	Coefficient	SE	p-value	Odds ratio	95% CI
Interrupted suture†	0.942	0.355	0.008	2.564	1.280 to 5.137
Mediolateral episiotomy‡	0.016	0.366	0.965	1.016	0.496 to 2.082
Age (years)	-0.105	0.063	0.097	0.900	0.795 to 1.019
BMI (kg/m ²)	0.021	0.042	0.621	1.021	0.940 to 1.109
Gestational age (weeks)	-0.503	0.266	0.059	0.605	0.359 to 1.019
Constant	19.042				

SE = standard error, 95% CI = 95% confidence interval.

†Refers to continuous suturing. ‡Refers to lateral episiotomy.

This table showed the results of multivariable binary logistic regression analysis of the relation between suturing technique or type of episiotomy and the occurrence of dyspareunia 3 months after episiotomy interfering with intercourse as adjusted for age, BMI, and gestational age.

The interrupted suturing technique was an independent predictor of dyspareunia interfering with intercourse. Meaning, when other factors were neutralized to just measure suture techniques, we found that the interrupted technique had a higher incidence of dyspareunia.

However, after adjusting for the other variables, the type of episiotomy was not independently related to the occurrence of dyspareunia interfering with intercourse, which means that when other factors were neutralized to just measure the type of episiotomy, we found that the mediolateral type was affected by these variables.

DISCUSSION

This study was designed to assess the effects of continuous versus interrupted sutures with regard to short-term postpartum maternal morbidity that follows mediolateral and lateral episiotomies repair after vaginal delivery.

A total of 260 pregnant women enrolled into the study were assigned randomly into two groups; each included (130) women that were subdivided into two subgroups of 60 women each. The first group received interrupted episiotomy repair, while the second received continuous episiotomy repair.

The current study revealed that there was a prevalence of the need for analgesia to 65 women (27.5%), while 72 women (30.5%) had a wound infection and dehiscence after episiotomy, due to?

Main outcomes of the study:

Perineal pain and the need for analgesia: the current study revealed that there was a high significant increase in the number of patients who

have pain in the interrupted technique more than those in the continuous technique.

Similarly, the comparison between the two studied subgroups of lateral and mediolateral episiotomy regarding the perineal pain at 6 hours demonstrated that the number of patients suffering from a perineal pain in mediolateral group was significantly more than the patients in lateral group. A comparison of pain score between all subgroups revealed that the continuous-lateral had the lowest pain score compared to other three groups. The pain score increases gradually in continuous mediolateral more than in the interrupted lateral, and it was the highest in interrupted mediolateral.

Our results agree with those reported by **Dash et al.**^[15] and **Nagure et al.**^[27] who reported that there was a greater reduction in perineal pain associated with continuous suturing for all layers. In another study, **Valenzuela et al.**^[16] stated that there was no statistically significant difference detected between continuous and interrupted groups as regards perineal pain. **Hasanpoor et al.**^[26] also pointed out that there was no significant difference between both groups in pain severity variations at 12-18 hours and the 10th day after delivery. Because our study measured the pain at first 6 hours before taking analgesic in order to measure the need of it.

Our results were in agreement with those reported by **Kettle et al.**^[17] and **Dash et al.**^[15] in that there were lower VAS scores in continuous groups than in interrupted groups at 12 hours, 48 hours and after ten days. **Nagure et al.**^[27] reported that there were lower VAS scores in continuous groups than interrupted groups at 12 hours, and 48 hours only. **VAS at 6 hours was** lower in the continuous groups than in the interrupted groups, yet with no expressive difference. Our results were in disagreement with those stated by **Aslam et al.**^[18] who reported that complication of pain and its severity in both groups at 24 hours and 10th day were compared which showed no significant difference at any severity (i.e., no pain, mild, moderate / severe). **Kathrine et al.**^[19] showed in their study that lateral episiotomies were not associated with causing more perineal pain on the first postpartum day in comparison with the midline and mediolateral episiotomy techniques.

As regard the need for analgesia, the current study revealed that there was no statistically significant difference between the two suture techniques. Our results were in disagreement with those stated by **Howida et al.**^[20] in which the use of a continuous knotless

technique for perineal repair was associated with less time of wound suturing, perineal pain at 48 hours, 6-10 days, less need for pain killers and lower VAS scores than those associated with techniques of interrupted sutures and **Nagure et al.**^[27] who reported that there was overall reduction in analgesia use in association with the continuous techniques for perineal closure versus interrupted techniques. Because they measure pain score on longer duration of follow up so increase the need for analgesia.^[20,27]

The current study revealed that the incidence of dyspareunia 3 months after delivery was less in the continuous than in interrupted groups with a significant difference. Our results agree with those of **Samal et al.**^[21] who pointed out that subjects in the interrupted group had greater complaints of dyspareunia in comparison with those in the continuous group up to three months after delivery. Similar observations were made by the **Detlefsen et al.**^[28] trials that reported lower rates of dyspareunia in the continuous suturing groups which were statistically significant. But **Kokanali et al.**^[29] reported that the differences between the pain during sexual intercourse 6 weeks after the delivery was statistically same. **Morano et al.**^[30] also reported that no difference was found in superficial dyspareunia at 3 months for the continuous knotless technique versus the interrupted technique group. **Kettle et al.**^[17] in Cochrane database systematic reviews, indicated that there was no evidence of significant differences between groups for dyspareunia at three, or at six to 12 months. Because of complication that happened and the patients not caring of completing their medication or doing exercises.^[17]

Lopamudra et al.^[31] illustrated that continuous suturing technique for repair of episiotomy and the second degree of perineal tear compared to interrupted methods were associated with less short-term pain, dyspareunia and amount of suture material used was also less but there was no difference in daily work after 42 days and incidence of wound dehiscence.^[31]

The current study revealed that in dyspareunia, that completely prevents intercourse; there was no difference in the continuous and interrupted groups, and in the mediolateral and lateral subgroups because of small number of cases (two cases only). Our results were in agreement with those reported by **Pavlina et al.**^[24] that no difference regarding resumption and regularity of sex, timing of resumption, frequency and intensity of dyspareunia, perineal pain, aesthetic appearance or overall satisfaction 3M or

6M postpartum. 98.0% of women after MLE and 97.7% after LE resumed sexual intercourse within 6M after delivery. In the same period, 15.6% of women after MLE and 16.1% after LE suffered from considerable dyspareunia. **Kathrine et al.**^[19] did not find an association between different episiotomy techniques and intercourse resumption ($p=0.15$), nor did she find any significant difference between short and long episiotomies and resumption of coitus ($p=0.40$). Similarly, no difference between midline, lateral, and non-classifiable incision point groups and coital resumption was found ($p=0.14$).^[19]

The current study revealed that according to the Marinoff score, there was a high statistically significant difference between the interrupted and continuous suturing techniques in patients undergoing mediolateral episiotomy. Also, the difference between the two suturing techniques was statistically significant in patients undergoing lateral episiotomy, since it was higher in patients repaired by interrupted suture technique. The incidence of dyspareunia which sometimes prevent intercourse was more in interrupted than continuous and in mediolateral than lateral. There was a high significant difference.

The current study revealed that the interrupted suturing technique was an independent predictor of dyspareunia interfering with intercourse. Meaning, when other factors were neutralized to just measure suture techniques, we found that the interrupted technique had a higher incidence of dyspareunia.

However, after adjusting for the other variables, the type of episiotomy was not independently related to the occurrence of dyspareunia interfering with intercourse, which means that when other factors were neutralized to just measure the type of episiotomy, we found that the mediolateral type was affected by these variables.

As regard wound complication (infection and dehiscence): the current study revealed that the incidence of wound infection and dehiscence was higher in the interrupted group than in the continuous group and in lateral than mediolateral episiotomy. Our results were in disagreement with those of **Samal et al.**^[21] who reported that three cases requiring resuturing in each comparison group; the Banninger and Morano trials reported none in either group. Kettle C et al, in Cochrane database systematic reviews meta-analysis, reported that there was no difference in risk of resuturing between groups. In Mohamed study, 3 cases (4.2%) in continuous group had wound dehiscence compared to 5 cases (7.0%) in

interrupted group which was statistically insignificant ($p=0.384$). The suture material used in both groups was the same i.e. rapidly absorbed polyglactin 910, and it was proved that the suture material rather than the suturing technique was responsible for wound dehiscence. This disagreement may be due to suture material infection, contaminated measures and bad hygiene.^[21]

Also, **Kathrine et al.**^[19] did not find an association with technique ($p=0.73$), nor was there any association with wound infection when comparing midline, lateral, and non-classifiable episiotomy incision points ($p=0.37$). **Sagi et al.**^[3] found that no important differences in perineal outcomes (wound infection and dehiscence) were shown by the trials comparing lateral with mediolateral episiotomy.^[3]

• **Implication of this study for practice:**

- 1) Since all types of episiotomy were associated with the same degree of complication the elective use of episiotomy is better than its routine use due to its being safer except if there is an indication of episiotomy.
- 2) The continuous suture technique is recommended for repair and it is better than interrupted suture technique since it is associated with decreased VAS pain score and dyspareunia.
- 3) The lateral episiotomy is better than the mediolateral because it is associated with less VAS pain score and possibly less incidence of dyspareunia.
- 4) Wound complication (infection and dehiscence) is less in continuous suture technique and mediolateral episiotomy.

• **Needed future studies:**

- 1) The effect of suture technique on pelvic floor, stress urinary incontinence, fecal incontinence and rectal prolapse.
- 2) The effect of type of episiotomy on pelvic floor, urinary and fecal incontinence and prolapse.

• **Points of strengths in this study:**

- 1) Good sample size with small dropout rates; as follow up was by telephone call and more than one phone number and address for the same patient were recorded.
- 2) We adjusted other variables (BMI, age) by neutralizing them using a multivariable regression analysis to just measure suture techniques. We found that the interrupted technique had a higher

pain score and dyspareunia. On the other hand mediolateral type had a higher pain score and dyspareunia but type of episiotomy was affected by other variables.

• **Points of weakness in this study:**

- 1) All episiotomies was not conducted by the same surgeon, but we overcame that by unifying the level of surgeons; all were senior residents.
- 2) The Marrinoff scale of measuring dyspareunia is a qualitative measure not subjective; it depends on patient evaluation, but we tried to simplify the score to cope with the level of education of all patients.
- 3) In this study, we did not take in consideration some factors that may have affected the pain score and dyspareunia such as the use of contraceptive methods, incidence of lactational amenorrhea and the presence of vaginal infection.

CONCLUSION AND RECOMMENDATIONS

The use of a continuous knotless technique for perineal repair is associated with **perineal pain at 6 hours, need for analgesia, lower VAS scores, lower dyspareunia scale and less wound complication** than interrupted sutures techniques.

For that, the introduction of a continuous suturing policy would provide **more comfortability, less analgesia, less perineal pain, less dyspareunia and less wound complication** are needed than for the interrupted method of repair.

REFERENCES

1. **Carroli G and Mignini L (2009):** Review Episiotomy for vaginal birth. *Cochrane Database Syst. Rev.*, 21: (1):CD000081.
2. **Delancey J (2008):** Surgical anatomy of the female pelvis. In: *Te Linde's Operative Gynecology*. Rock JA and Jones HW (eds.). 10th Ed. Lippincott Williams & Wilkins, Pp, 82-98.
3. **Sagi-Dain L and Sagi S. (2015):** The correct episiotomy: does it exist? A cross sectional survey of four public Israeli hospitals and review of the literature. *Int. Urogynecol. J.*, 26(8):1213–1219.
4. **Cunningham FG, Leveno KJ, Bloom SL et al. (2010):** Maternal Anatomy. In: *Williams Obstetrics*, by Appleton and Lange, New York. Edn., 23:14-36.
5. **Sultan AH, Thakar R and Fenner DG (2007):** Repair of Episiotomy, First and Second Degree Tears. In: *Perineal and Anal Sphincter Trauma*. Springer-Verlag London.
6. **Wood J, Amos L and Rieger N (1998):** Third degree anal sphincter tears: risk factors and outcome. *Aust. N.Z. J. Obstet. Gynecol.*, 38: 414-417.
7. **Hodnett ED, Gates S, Hofmeyr GJ, et al. (2003):** Continuous support for women during childbirth. *Cochrane Database Syst. Rev.*, CD003766.
8. **Gupta JK and Nikodem VC (2000):** Position for women during second stage of labor. *Cochrane Database Syst. Rev.*, (2):CD002006.
9. **Wagner M (2000):** Choosing caesarean section. *Lancet*, 356:1677–1680.
10. **Sultan AH and Thakar R (2002):** Lower genital tract and anal sphincter trauma. *Best. Pract. Res. Clin. Obstet. Gynaecol.*, 16:99–115.
11. **Kettle C, Hills R and Ismail K (2007):** Continuous versus interrupted sutures for repair of episiotomy or second degree tears. *Cochrane Database of Systematic Reviews*, 4: CD000947.
12. **Johanson R (2000):** Perineal massage for prevention of perineal trauma in childbirth. *Lancet*, 355:250–251.
13. **Robson K. (1981):** Maternal sexuality. *B.J.O.G.*, 88: 1981.
14. **Ejegard H, Ryding EL, Sjogren S et al. (2008):** Sexuality after delivery with episiotomy: a long-term follow-up. *Gynecol. Obstet. Invest.*, 66 (1):1-7.
15. **Dash S, Sekhara S, Nanda C et al. (2013):** Continuous Versus Interrupted Sutures for Episiotomy Wound and Perineal Tear Repair. *Sch. J. App. Med. Sci.*, 1(6):710-713.
16. **Valenzuela P, Saiz Puente MS, Valero JL et al. (2009):** Continuous versus interrupted sutures for repair of episiotomy or second degree perineal tears: A randomized controlled trial. *J.O.G.*, 116(3):436-441.
17. **Kettle C, Dowswe T and Wasmal KM (2012):** Continuous and interrupted suturing techniques for repair of episiotomy or second-degree tears. *Cochrane Database Syst. Rev.*, 14(11):CD000947.
18. **Aslam R, Khan SA, Ul Amir Z et al. (2015):** Journal of Ayub Medical College, Abbottabad. *J.A.M.C.*, 27(3):680-683.
19. **Kathrine F, Anne C and Katariina L (2014):** Effect of different episiotomy techniques on perineal pain and sexual activity 3 months after delivery. *Int. Urogynecol J.*, 25:1629–1637.
20. **Howida E, Shamel M, Ahmed M et al. (2013):** Continuous versus interrupted sutures technique for repair of episiotomy or second degree perineal tears: A randomized trial. Faculty of Medicine - Department of Gynecology and Obstetrics, Cairo University.
21. **Samal SK and Rathod S (2017):** Comparative analysis of continuous and interrupted suturing techniques for repair of episiotomy or second degree perineal tear. *Int. J. Reprod. Contracept. Obstet. Gynecol.*, 6:1002-1006.
22. **Sagi-Dain L, Bahous R, Caspin O et al. (2015):** A comparative study of continuous versus interrupted suturing for repair of episiotomy or second degree perineal tear. *Int. J. Reprod. Contracept. Obstet. Gynecol.*, 4(1):52-55.
23. **ACOG (2016):** Practice Bulletin No. 165: Prevention and Management of Obstetric Lacerations at Vaginal Delivery. American College of Obstetricians and

- Gynecologists' Committee on Practice Bulletins—Obstetrics. *Obstet. Gynecol.*, 128(1):1-15.
- 24. Pavlina N, Jaroslava K, Zdenek R et al. (2016):** Sexual and Reproductive Healthcare: Mediolateral versus lateral episiotomy and their effect on postpartum coital activity and dyspareunia rate 3 and 6 months postpartum. <https://www.sciencedirect.com/science/article/pii/S1877575616000161>
- 25. Kathrine F, Katariina L and Anne C (2013):** Different episiotomy techniques, postpartum perineal pain, and blood loss: an observational study. *Int. Urogynecol. J.*, 24:865–872.
- 26. Hasanpoor S, Soheila B, Rudabe S, Morteza G (2012):** The Effects of Continuous and Interrupted Episiotomy Repair on Pain Severity and Rate of Perineal Repair: A Controlled Randomized Clinical Trial, 024.1(3): 165–171.
- 27. Nagure Abed Gulab, Valsamma Chacko, Umashankar K. M, Mahe Darakshan M. Saleem (2013):** Continuous vs interrupted sutures for the repair of episiotomy: A comparative study. *Indian Journal of Basic & Applied Medical Research*, 2: 1131-1137 .
- 28. Detlefsen GU, Vinther S, Larsen P, Schroeder E (1980):** Intradermal suturing of episiotomy wounds compared with interrupted sutures. *Ugeskrift for Laeger*, 142:3117-20.
- 29. Kokanalý D, Ugur M, Kuntay Kokanalý M, Karayalcýn R and Tonguc E (2011):** Continuous versus interrupted episiotomy repair with monofilament or multifilament absorbed suture materials: a randomized controlled trial. *Arch Gynecol. Obstet.*, 284(2): 275-280.
- 30. Morano S, Mwastrangelo E, Pastorino D et al. (2006):** A randomized comparison of suturing techniques for episiotomy and laceration repair after spontaneous vaginal birth. *Journal of minimally invasive Gynecology*, 13: 457-462.
- 31. Lopamudra J, Sagi-Dain L, Rabia B, Orna C, Kreinin-Bleicher I and Shyama K (2015):** A comparative study of continuous versus interrupted suturing for repair of episiotomy or second degree perineal tear. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. Jena L et al. *Int J Reprod Contracept Obstet Gynecol.*, 4(1):52-55.