



## ORIGINAL ARTICLE

## Interrupted Versus Continuous Suturing of Episiotomy : A Comparative Study

Mahmoud Ahmed Ghareeb, Azza Abd Elmageid Abd Elhameid, Mohamed El-Bakry Lashin, Lamis Elsayed Soliman\*

Department of Obstetrics & Gynecology, Faculty of Medicine, Zagazig University, Zagazig, Egypt

## \*Corresponding

author: Lamis Elsayed Soliman; : resident of obstetrics and gynecology – AlAhrar teaching Hospital - Zagazige - Egypt. [drlamis89@gmail.com](mailto:drlamis89@gmail.com).

Submit Date: 10-5-2019

Revise Date: 14-6-2019

Accept Date: 16-6-2019

## ABSTRACT

**Background:** A great number of pregnant ladies worldwide experience suturing for perineal injury after labour and the kind of repair may affect healing and perineal pain. For over 80 years, most researchers have been proposing that technique of continuous suturing for repairing vagina, pelvic floor muscles and skin are related with less pain than that of interrupted techniques. This study aims to assess the effects of continuous versus interrupted suturing techniques for episiotomy repair following childbirth. **Methods:** The study included 150 pregnant women admitted for labour underwent a mediolateral episiotomy before vaginal delivery at Zagazig University Hospitals and AlAhrar teaching hospital. in the period from October 2017 to December 2018. Patients were at random assigned into two groups: group A and group B.

Group A: were repaired by continuous suturing technique using polyglactin 910 (vicryl) sutures No 2/0. Including 75 patients.

Group B: were repaired by interrupted suturing technique using polyglactin 910 (vicryl) sutures No 2/0. Including 75 patients. **Results:** The results exhibited that there was highly statistically significant difference between the two groups regarding time needed for repair, amount of suture material and Perineal pain at 6 & 12 hours measured by VAS scales lower at continuous group, and non-significant difference after that.

There was non-significant difference between the two groups regarding Amount of blood loss, Perineal repair rate, need for analgesics, Post-natal stay, Wound infection, Healing defects, Dyschezia, Dyspareunia Cosmetic disfigurement and Patient satisfaction. **Conclusion:** Continuous suturing technique is recommended over interrupted suturing technique since it is associated with less perineal pain in first days of post-natal period, suture material amount used and less time needed to be performed.

**Keywords:** Episiotomy repair; continuous suturing; interrupted.

## INTRODUCTION

Investigation on physical assessment of the health-related quality of life measures in ladies after various types of delivery demonstrated that women with vaginal delivery reported better health-related quality of life compared with emergency or elective caesarean section [1].

Episiotomy is the surgical incision of perineum made to widens vaginal opening during labour. About 85 % of ladies who have spontaneous vaginal delivery will get some sort of perineal trauma, and more than 69% should have sutures. Episiotomies are

referred to give more benefits as it forestall vaginal tears, ensure against incontinence, secure against prolapse and heals simpler than tears [2].

Regardless of all those evidence authenticating selective utilization of episiotomy and though routine utilization of that procedure is contraindicated, real indications for performing episiotomy in recent practice still needs to be clarified [3].

As per to the {American College of Obstetricians and Gynecologists} [4], in light of the existent proof, there are no specic circumstance in which episiotomy is

fundamental, and the choice to play out an episiotomy ought to be founded on clinical considerations [4].

Short or long-dated maternal morbidity related to perineal repair might prompt physical, social or psychological issues, influencing the lady's ability to take care for her newborn and her family[5].

Complications rely upon severity of the perineal trauma and on effectiveness of treatment. Also type of suturing material, the choice of repair technique, and skills of the operator are the three primary components influence the result of the perineal repair[6].

Type of repairing may affect pain and healing. The best method for episiotomy repair should require less time to perform and less utilization of materials and produces less pain in short and in long term period [6].

Episiotomy is generally repaired through three stages. Initially a continuous stitches are inserted for closing the vagina, beginning at the apex of the wound and ending at the site of fourchette using a loop knot. Next deep then superficial peineal muscles are re-approximated using three to five interrupted sutures. and lastly, the perineal skin is closed through inserting interrupted stitches or continuous stitches[7].

Continuous sutures can generate a close perfect and fast closure and relation of two the surfaces with good haemostasis. But their major disservice is that the entire stitches must be removed in case of infection, serous or bloody ooze cannot get-away from underneath suture line and often create a thick scar possibly identified with presence of larger amount of suture material, that has been absorbed [8].

Interrupted suture is utilized where it is important to remove singular sutures or where there is possibility of infection or risk of serious or bloody oozing [8].

Sutures can be mainly ordered in to 3 groups dependent on the manufacturing process. sutures are: 1) Monofilament sutures, 2) Multifilament sutures and 3) pseudo monofilament sutures[9].

Surgical sutures could be additionally ordered into two groups. which are 1) absorbable sutures and 2) nonabsorbable sutures. Absorbable suture: experience degradation

and it loses its tensile strength inside 60 days either through enzymal degradation and the resulting hydrolytic or bythat hydrolytic alone (eg; polyglycolic acid). On the other hand absorbable sutures can be additionally classified into two groups. 1) Natural (eg catgut, collagen) and 2) Synthetic (eg.: Dexon, Vicryl, PDS) [10].

Nonabsorbable sutures hold tensile strength for about 60 days (eg.: Polypropylene). and like absorbable sutures, the nonabsorbable sutures are also characterized into two groups. They are 1) Nature(eg.: Silk, Linen, Cotton) and 2) Synthetic(eg.: Polyester, Polyamide, Polybutester, Stainless steel) [11]. This study aims to compare between outcomes of continuous versus interrupted suturing for episiotomy repair when the use of episiotomy is indicated. so that best technique may be determined and used in the future.

#### METHODS

The study included 150 pregnant women admitted for labour underwent a mediolateral episiotomy before vaginal delivery at Zagazig University Hospitals and Al-Ahrar teaching hospital.

Patients selection criteria: In order to be included in the study the women should be in labour and episiotomy was indicated.

All patients included in the study fulfilled the following criteria:

- primigravid women in labor .
- At term.
- Vertex presentation.
- Live baby.
- Singleton pregnancy.
- Age group 20-30 years old.

Exclusion Criteria:

- Instrumental vaginal delivery.
- Previous perineal surgery.
- Cases of impaired immunity as (diabetes mellitus, patients receiving corticosteroids).
- Obesity (BMI > 30).
- High risk pregnancy as Hypertension, Anemia or bleeding tendency.
- Suspected genital infection.

Patients were classified randomly into 2 groups:

Group A: were repaired by continuous suturing technique using polyglactin 910 (vicryl) sutures No 2/0. Including 75 patients.

Group B: were repaired by interrupted suturing technique using polyglactin 910 (vicryl) sutures No 2/0. Including 75 patients. Written informed consent was obtained from all participants and the study was approved by the research ethical committee of Faculty of Medicine, Zagazig University and AlAhrar teaching hospital. The work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Type of study: A randomized comparative interventional trial.

Site of study: This study was carried at Obstetrics and Gynaecology Department, Zagazig University Hospitals and Al-Ahrar Teaching Hospital.

Sample size and method of selection:

Assuming that long-term outcome in continuous knotless technique group was (94.9%) versus (78.1%) in the interrupted suture group [12], and at power of test (80%) and confidence level (95%) the sample was calculated at Community Department, Faculty Of Medicine, Zagazig University by using EPI INFO version 6; to be (150) cases.

All women were subjected to:

- History taking: history was taken from all women: Personal history, complaint, history of the present pregnancy, obstetric history and family history:
- General examination: including vital data and body mass index.
- Abdominal examination: palpation and auscultation of the fetal heart rate.
- Local pelvic examination: per vaginal examination
- Investigations: Routine laboratory investigations and abdominal ultrasound.
- Management of second stage of labor: including performing mediolateral episiotomy, at the time of head crowning, using a local anesthesia (5-10 cm xylocaine), performed with scissor
- Management of the third stage of labor
  - Technique of repair:
    - The episiotomy incision was repaired after delivery of the placenta and insertion of a pack vaginally to differentiate between uterine blood and bleeding from episiotomy wound.

- The suture material used in the study was No 2/0.

- First, it was essential to assess the extent of damage.

- For group (A) continuous stitches were inserted for closing the vagina, starting at the wound apex and finished at the fourchette level with a loop knot. Next the deep and superficial perineal muscles were reapproximated with three to four interrupted sutures and at last, perineal skin was closed through inserting continuous stitches.

- For group (B) a continuous stitch was commenced to close the vaginal epithelium above the wound apex and to be finished at the fourchette level. Three to four interrupted sutures were taken to reapproximate deep and superficial muscles, then interrupted transcutaneous stitches was also taken to close the skin layer.

- before discharging from labor room:

- ✓ Evacuation of urinary bladder by Foley catheter (16-18 French).

- ✓ Each woman received 1 gm vial of second-generation cephalosporin as a prophylactic antibiotic and single ampoule 75mg diclofenac sodium as an analgesic.

- ✓ Vaginal pack was removed.

Post-operative care: Local care of the wound was discussed with the patient.

- Follow up:

Patients' personal data recorded and patients were followed through regular visits and telephone calls

All patients observed for 12 hours after labour for additional need for analgesia and perineal pain all patients were reevaluated after first 48 hours at the outpatient clinic then weekly at first month then monthly for 3 months as regards:

- ❖ Intraoperative outcome:

1. Amount of suture material used was estimated through subtracting the remaining amount of suture material from the whole length.

2. Time needed for episiotomy repair was estimated by a stop watch starting from the first stitch vaginally to the last stitch transcutaneously.

3. Amount of blood loss during episiotomy repair: measured subjectively, patients were scored at one of three categories:

- 1) Blood loss: less than 200 ml
- 2) Blood loss: between 200 ml – 250 ml.
- 3) Blood loss: more than 250 ml

❖ Primary outcome (first 4 weeks):

1. Perineal pain and the need for analgesia up to 48 hours postnatal.

Patient was followed up for perineal pain using the visual analogue scale (VAS) [13].

2. Perineal repair rate assessed using REEDA scoring scale (A tool which estimate inflammatory process and the healing of tissues in perineal trauma, by the assessing five items for healing: R= Redness (refers to hyperaemia), E= Oedema, E = Ecchymosis, D= Discharge and A= Approximation of wound edges or coaptation, a score ranging from 0 to 3 assessed for each item. the higher the score, the greater level of tissue trauma. With a maximum value = 15 which signalizes worst perineum healing outcome [14]

3. Wound dehiscence and infection: by the clinical evaluation by the classic signs of infection which are: “hotness, redness, pain, swelling, delayed healing, exudates, odour, contact bleeding, and abnormal granulation tissue”

Confirmed by culture and sensitivity tests.

❖ Secondary outcome (3 months):

1. Dyspareunia.
2. Anal sphincter function: mainly dyschezia.
3. Cosmetic disfigurement and patient satisfaction.

Data collection

For collecting data, a standard pre-coded format was used for entry of data on computer. For specific patients who were chosen after matching the eligibility criteria, using a certain check list, and patients previously agreed on participation in the study through signing informed consent, information then collected and filled in this form. The checklist and the form were completed by the same researcher.

Data collection was completed through regular visits at 48 hours, at 1 week, at 3 weeks, at 6 weeks, and at 3 months. And through telephone calls at 2 weeks, 4 weeks, after first intercourse wherever resumed and

at any time if any complications noted by the patient.

**Statistical Analysis**

Data were analyzed using SPSS© Statistics version 23 (IBM© Corp., Armonk, NY, USA).

Description of quantitative variables as mean, SD and range.

Description of qualitative variables as number and percentage.

Chi-square test was used to compare qualitative variables between groups

Unpaired t-test was used to compare two groups as regard quantitative variable in parametric data (SD<50% mean).

P value >0.05 insignificant.

P value <0.05 significant

P value <0.01 highly significant.

Multi-variable regression analysis was used to examine the relation between the suturing techniques or type of episiotomy and the pain score as adjusted for other confounding factors.

**RESULTS**

● Initially 164 primigravid women were enrolled, 14 cases were excluded:

- 6 cases: there was no need for episiotomy.
- 4 cases: converted to cesarean section.
- 1 case: developed complete perineal tear.
- 3 cases: missed during follow up.

● We carried out this study on (150) lady whom randomly selected to get a mediolateral episiotomy during the second stage of vaginal delivery either by continuous suturing technique or interrupted suturing technique.

**75 women** were repaired by continuous suturing technique using polyglactin 910 (vicryl) sutures No 2/0. And **75 women** were repaired by interrupted suturing technique using polyglactin 910 (vicryl) sutures No 2/0.

● There was non-significant difference between two groups regarding maternal age, BMI, job, prenatal care and fetal birth weight as shown in table 1.

● There is a highly significant difference between two groups regarding Time needed for episiotomy repair and amount of suture material used for repair, while the difference in amount of blood loss not quite statistically significant, data expressed in table 2, 3 and, 4

● Regarding VAS at first 6 hours, at 12 hours and after first 7 days was significant difference. At 21 days and at 3 months the difference between both groups became non-significant, Figure 1.

● There is non-significant difference between the two groups regarding Wound

infection, Healing defects or Patient satisfaction, Table 6.

● There is non-significant difference between the two groups regarding Dyschezia or Dyspareunia, Table 6.

**Table 1.** Comparison between both groups regarding Demographic and obstetric data.

	Group I (n=75) X±S.D	Group II (n=75) X±S.D	T test	P value
Age (Years)	24.35 ± 3.84	25.46 ± 4.65	1.691	0.093 (NS)
BMI	25.79 ± 4.18	26.67 ± 2.99	1.482	0.141 (NS)
Job				
- Housewife	64	85.3%	60	80%
- In-House Employee	9	12%	11	14.7%
- Work Outside	2	2.7%	4	5.3%
Prenatal Care				
- Regular	72	96%	74	98.7%
- Irregular	3	4%	1	1.3%
Fetal Birth Weight (gm)	2917.86 ± 565.5	2952.94 ± 568.9	0.0402	0.688 (NS)

**Table 2.** Comparison between both groups regarding time needed for episiotomy, amount of blood loss and Amount of suture material used.

	Group I (n=75) X±S.D	Group II (n=75) X±S.D	T test	P value
Time needed for episiotomy repair (Min.)	12.60 ± 1.85	15.62 ± 2.77	8.358	<0.001 (HS)
Blood loss (ml)	250.45 ± 17.85	245.70 ± 15.25	1.752	0.0818 (NS)
Amount of suture material (cm)	83.20 ± 8.72	86.58 ± 9.50	2.414	0.017 (S)

**Table 3.** Comparison between both groups regarding Need for Analgesia within first 48 hours.

	Group I (n=75)		Group II (n=75)		Chi square	P value
<b>Need for Analgesia:</b>	N	%	N	%	10.3683	.001282(H)
	10	13.3%	27	36%		

**Table 4.** Comparison between both groups regarding perineal repair rate at 12 hours after delivery assessed by REEDA score.

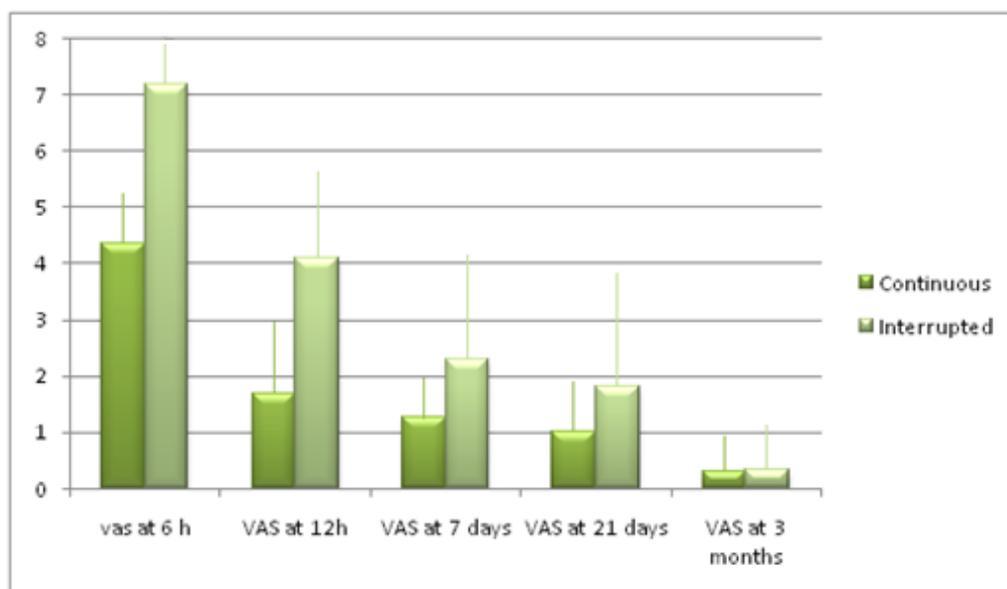
	Group I (n=75) X ± S.D	Group II (n=75) X ± S.D	T test	P value
<b>REEDA score at 12h</b>	6.20 ± 2.35	6.90 ± 2.65	1.7116	0.0891 (NS).
<b>REEDA score at 14 days</b>	1.40 ± 0.50	1.55 ± 0.65	1.5841	0.1153 (NS).

**Table 5.** Comparison between both groups regarding VAS at 6 hours, 12h, 7days, and 21days and at 3months.

	Group I (n=75) X ± S.D	Group II (n=75) X ± S.D	T test	P value
<b>VAS at 6h</b>	4.36 ± 1.009	7.18± 1.351	14.4834	<0.001 (HS)
<b>VAS at 12h</b>	1.68 ± 1.329	4.09 ± 1.501	11.090	<0.001 (HS)
<b>VAS at 7 days</b>	1.28 ± 0.881	2.30 ± 1.857	4.485	0.001 (S)
<b>VAS at 21 days</b>	1.01 ± 0.925	1.82 ± 1.845	0.1581	0.8746 (NS)
<b>VAS at 3 months</b>	0.310 ± 0.761	0.330 ± 0.847	0.1521	0.8793 (NS)

**Table 6.** Comparison between both groups regarding wound infection, the need for Wound resuturing, Dyschezia at 21 days, Dyspareunia at 3 months, Healing defects and Patient satisfaction after 3 months.

	Group I		Group II		Chi square	P value
	N	%	N	%		
<b>Wound infection</b>	7	9.3%	6	8%	0.0842	0.771655 (NS)
<b>Wound resuturing</b>	2	2.6%	1	1.3%	0.3406	0.559829 (NS)
<b>Dyspareunia</b>	12	16%	14	18.7%	0.1861	0.666178 (NS)
<b>Dyschezia</b>	4	5.3%	6	8%	0.429	0.806944 (NS)
<b>Healing defects</b>	1	1.3%	0	0%	1.0074	0.31562 (NS)
<b>Patient satisfaction</b>	71	94.7%	73	97.3%	0.6942	0.404806 (NS)



**Fig 1.** Shows continuous and interrupted suture technique groups as regard VAS

## DISCUSSION

A total of 164 pregnant women were enrolled into the study 150 of them completed the study, they were randomly assigned into two groups; each included (75) women. The first group received continuous suture technique episiotomy repair, while the second group received interrupted suture technique for episiotomy repair.

Concerning time needed for wound suturing, Current study presented that there was significant difference between the continuous and the interrupted techniques, under which continuous groups had less time for wound suturing in minutes ( $12.60 \pm 1.853$ ), while interrupted groups consumed more time ( $15.62 \pm 2.773$ ) Table 2., The results agreed with previous studies including [6], who published their research on 445 women who had undergone vaginal deliveries episiotomies, one group was repaired with continuous sutures and the other group with interrupted Sutures, there was statistically significant higher operative time in interrupted group than continuous group.

The results of the present Study also agreed with Kokanali et al. [15], Perveen and shabbir. [16] and Kettle et al. [17] who reported that continuous technique needed less time for repair than the interrupted one.

Concerning length of the used suture material, the obtained results cleared that

there was significant difference between both groups; with continuous technique less suture material was used. In continuous technique the mean was length  $83.20 \pm 8.723$  (cm) with while interrupted technique the mean length was  $86.58 \pm 9.499$  (cm) Table 2. The results agreed with previous studies including Valenzuela et al. [6], Kokanali et al. [15], Perveen and Shabbir. [16] and Kettle et al. [17] who reported that continuous technique needed less suture material than interrupted technique

About Postpartum perineal pain and the need for additional analgesia: the present study showed that the numbers of patients who expressed pain in the interrupted suturing technique were more than whom in the continuous suturing technique with a highly significant difference between two groups, Table 3.

At this point our results agreed with results reported by Kokanali et al. [15], Kettle et al. [17], Dash et al. [18]; and Nagure et al. [19] they stated that there was a higher reduction in postpartum perineal pain with continuous suturing. Another study by Valenzuela et al. [6] proclaimed that they found no statistically significant difference between both continuous and interrupted groups considering perineal pain. Another study Hasanpoor et al. [20] also stated that they found no significant difference between

continuous and interrupted groups in variations of pain severity at 12 hours and at 18 hours and at the 10th day after labour. *Maybe because* in current study pain was measured at shorter duration at first 6 hours.

Considering the need for additional analgesia, the present study stated that there was highly significant difference between two suture techniques higher among interrupted group than in continuous one, Table 3. Our current results were in agreement with those reported by Howidaa et al. [21] in which the usage of a continuous suturing technique for perineal repair was associated with less time needed for wound suturing and perineal pain at first 48 hours, during 6-10 days, pain killers usage reduction and lower scores of VAS than that associated with techniques of interrupted suturing and Naegure et al. [19] who stated that there was total reduction in analgesics usage in the continuous techniques for the perineal repair versus that in interrupted techniques.

In regard to other complications of healing (dehiscence, infection and incomplete healing): our present study showed that wound infection incidence and dehiscence had no significant difference between the interrupted group and the continuous group Table 6. current results are in agreement with results of Samal et al. [22] they reported that in each group about three cases required resuturing; Morano [12] and the Banninger [23] trials declared in either group no cases required resuturing. Kettle C et al, [24] in {Cochrane database systematic reviews meta-analysis}, stated that risk of resuturing was indifferent in both groups.

Another agreement was with, Kathrine et al. [25]; who found no association with the suturing technique.

With respect to wound infection the results of the present Study coincide with those of Kettle et al. [26] and Morano et al. [12] who mentioned no significant differences in their study groups regarding wound infection. However, Kokanali et al. [15] did not observe any episiotomy infections.

Our results are also matched with Kokanali et al. [15], who didn't find any significant differences between the studied groups regarding incomplete healing.

In regard to dyspareunia 3 months after delivery the present study stated that the incidence of dyspareunia showed non-significant difference between the continuous and the interrupted groups Table 6. We agree with Kokanali-D et al. [15] who mentioned pain during sexual intercourse at 6 weeks after labour was statistically non-significant. also, Morano et al. [12] reported that they found no difference in superficial dyspareunia at 3 months for continuous suturing technique versus interrupted suturing technique group. Kettle et al. [17] another agreement is mentioned in Cochrane database systematic reviews, they mentioned that there was no evidence of significant differences between both groups regarding dyspareunia at 3, or at 6 to 12 months.

The current results disagree with results of Samal et al. [22] who mentioned that patients in interrupted group reported more complaints of dyspareunia in comparison with patients in continuous group throughout three months after delivery. Another agreement was with Detlefsen et al. [27] trials which stated lower rates of dyspareunia in continuous technique groups which with a significant difference.

*A disagreement was with* Lopamudra et al. [28] who reported less short-term perineal pain, dyspareunia at continuous group compared to interrupted group. *Maybe because* they assessed dyspareunia at short term duration whenever intercourse was resumed while we assessed dyspareunia after 3 months as a long-term complication.

Regarding cosmetic appearance or overall satisfaction, the current study revealed that there was non-significant difference between continuous and interrupted groups Table 6. Our results agreed with results mentioned by Pavlina et al. [29] they reported no difference in regularity and resumption of sex, the time of resumption, the intensity and frequency of dyspareunia, the perineal pain, cosmetic appearance or patient satisfaction 3 months and 6 months postpartum.

### CONCLUSION

We concluded that the continuous suturing technique of episiotomy is considered better than interrupted suturing technique as it showed less perineal pain in first days of post-

natal period, suture material amount used and less time needed to be performed.

### RECOMMENDATION

- The need for future studies:
- Effects of suturing technique on stress urinary incontinence, on pelvic floor strength, and rectal prolapse.
- Taking in consideration other factors which may affect pain scorer's dyspareunia such as: if the patient is lactating or not as lactational amenorrhea may be associated with vaginal dryness

The contraceptive method and signs of vaginal infections also should be considered.

### Declaration of interest:

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

**Funding information:** None declared

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**To Cite This Article:** Ghareeb MA, Abd Elhameid AA, Lashin ME, Soliman LE. Interrupted Versus Continuous Suturing of Episiotomy: A Comparative Study. *ZUMJ* 2020; 26 (2) 287-296; Doi: 10.21608/zumj.2019.12551.1221.