A Comparative Study Of Topical Skin Adhesive Or Sutures For Closure Due To Episiotomy Or Perineal Tears Following Child Birth

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Abstract: Background: Episiotomy is a surgical enlargement of the vaginal orifice by an incision to the perineum during the last part of the second stage of labour or delivery. **Objective:** To compare the use of skin adhesives e.g.,: liquib and versus suturing of the skin when repairing a first and second- degree perineal tear or episiotomy. **Patients and Methods:** This comparative study was conducted in El Sayed Galal University Maternity Hospital, in the period from September 2018 to March 2019. This study included 100 pregnant patients admitted for labor, were primigravidae and multigravida and were underwent an episiotomy after vaginal delivery. **Results:** The results showed that there was highly statistically significant difference could be detected between continuous and tissue glue groups as regard time of wound suturing that tissue glue group had less time of wound closure compared to continuous group. The results showed that there was highly statistically significant difference could be detected between continuous and tissue glue groups as regard perineal pain at 12 hours 48 hours measured by VAS scales that continuous group had a lower VAS scores compared to tissue glue group, but there is no significant difference after ten days. **Conclusion:** In this study we found that skin adhesive devices are more expensive than stitches and so far, no unequivocal demonstration of important clinical advantages has been demonstrated for the former in episiotomy repair.

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1. Introduction

Episiotomy refers to the surgical enlargement of the vagina at delivery, "Episiotomy" is defined as cutting the pudenda or external genitalia. "Perineotomy" is a more appropriate name for the procedure and is described as incising the area between the vulva and the anus. Nevertheless, episiotomy has become the accepted term for this process [(1)].

For the past three centuries, episiotomy has been a source of debate. In 1742, Sir Fielding Ould, a male-midwife, was the first to describe the procedure in his book, Treatise of Midwifery. He wrote that there were certain obstetric situations where the fetal head was unable to deliver secondary to "extraordinary constriction of the external orifice of the vagina." He believed that this constriction was "dangerous" for the fetus if it continued for a long time. If manual manipulation of the vagina could not facilitate delivery, he advised that "an incision can be made towards the anus with a pair of crooked probe-siccors introducing one blade between the head and the vagina [(2)].

To our knowledge, German physician Michaelis was the first physician to report utilizing an episiotomy in 1799. He performed the midline technique. At the same time, other practitioners recommended bilateral incisions perpendicular to the vaginal orifice. It Ritgen proposed numerous superficial incisions in 1820 [(3)].

Dubois, a French physician, suggested the mediolateral method in 1847. Episiotomy was first introduced in the United States in 1851 by Taliaferro who also advocated the mediotateral approach. The term "episiotomy" was coined in 1857 by Braun who asserted that the practice was unnecessary, as in the late 1800s, Kfistner, Von Ott, and Stahl separately encouraged the midline technique [(2)].

Initially, episiotomies were reserved for difficult births. By the end of the nineteenth century, the idea of the prophylactic episiotomy to prevent perineal laceration was introduced [(3)].

At the same time, a shift from home birth to hospital birth occurred in the United States. This change was secondary to advances in infection control and to the evolution of the "women's lying in" hospital [(1)].

Obstetricians in the United States believed that childbirth was "pathologic" and that an episiotomy was necessary for improved maternal and neonatal outcomes [(4)].

Theoretical benefits of episiotomy included: Substituting a clean cut for a ragged tear making repair easier and improving healing. Protecting the

neonate from delivery trauma, which was thought to result in cerebral hemorrhage, birth asphyxia, and possibly cerebral palsy. Shortening of the second stage of labor; and, preventing perineal damage and subsequent pelvic prolapse [(1)].

By the 1980s, episiotomy was performed in approximately 64% of vaginal deliveries in the United States. Around this time period, both parturients and physicians began questioning whether or not the purported "benefits" of episiotomy were true. In 1983, Thacker and Banta reviewed the literature on the procedure from 1860 to 1980, which included 3 studies with control groups and not one randomized controlled trial. These investigators concluded that the published studies were not scientifically adequate to prove the claimed benefits of episiotomy [(1)].

Following Thacker and Banta's paper, research on episiotomy burgeoned. In 1995, Woolley evaluated the literature from 1980 to 1994 and determined that episiotomies prevented anterior lacerations which were of little clinical consequence. The procedure failed to avert significant perineal trauma and to protect neonates from intracranial hemorrhage and intrapartum asphyxia. In this review, episiotomy was associated with increased blood loss, perineal damage, sphincter trauma, improper healing, and postpartum pain [(5)].

Aim of the Work

The aim of this study is to compare the use of skin adhesives e.g.,: liquib and versus suturing of the skin when repairing a first and second- degree perineal tear or episiotomy.

2. Patients and methods

This comparative study was conducted in El Sayed Galal University Maternity Hospital, in the period from September 2018 to March 2019.

This study included 100 pregnant patients admitted for labor, were primigravidae and multigravida and were underwent an episiotomy after vaginal delivery.

The patients were chosen to participate in the study after obtaining a verbal consent. They were randomly allocated into two groups A and B. The randomization was done by me using opaque sealed envelops. **Group A:** was repaired by continuous suturing technique and include 50 pregnant women. **Group B:** was repaired by tissue adhesive technique and include 50 pregnant women.

The Inclusion Criteria:

Vaginal birth, vertex presentation without instrumentation. Primiparous and parous women patients of at least 37 weeks gestation. Single pregnancy in active labor.

The exclusion criteria include:

Instrumental vaginal delivery. Previous perineal surgery. Preexisting medical condition that might adversely affect healing, example diabetes mellitus. Complicated episiotomy. The choice of repairing technique was concealed from the patient.

The patients of both groups A and B underwent the following:

History taking:

Full history was taken from the women including: Personal history: name, age, parity, address, occupation, telephone number, special habits as smoking and husband name and occupation. Complaint: as labor pain, gush of water per vagina. History of the present pregnancy date of last menstrual period (to calculate the gestational age and expected date of delivery EDD), dyspareunia, urinary incontinence, investigations done and drugs received Obstetric history: history of previous pregnancies, pregnancy outcome, abortion, ectopic pregnancy. Past history: medical diseases as hypertension or diabetes mellitus, history of pelvic floor surgery. Family history: of medical diseases as hypertension (HTN) or diabetes mellitus (DM).

General examination:

This included vital data signs blood pressure (BP), pulse, temperature, height, weight and body mass index (BMI).

Abdominal examination:

Abdominal palpation (Leopold Maneuvers) including the fundal level, fundal grip, 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. Auscultation of fetal heart rate.

Local pelvic examination:

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, soft), membranes (intact or ruptured), liquor (clear, blood stained. meconium staining), presentation (stated as cephalic, breech, cord,…), position (record LOA, ROP,…), caput, moulding. station (this is measured in centimeter above (-) or below (+) the ischial spines, example -five, -four, -three, -two, -one, zero (at spines). + one, + two, + three, + four, + five). All the data were documented in a partograph to evaluate the progression of labor all through the first stage of labor, including also, the number of oxytocin units given by intravenous infusion.

Investigations:

Routine laboratory investigations: e.g. Complete blood count (CBC). Rh type. Urine analysis for protein. Abdominal ultrasound for some cases.

Management of the second stage of labor:

When the cervix was fully dilated and head at station "zero" (the lowest portion of the occiput is at the level of the maternal ischial spines) the patient was transferred to the delivery room. They were placed in the lithotomy position, encouraged to bear down during the uterine contractions and rest in between them. Slow controlled delivery of the head, maintaining head flexion using (modified Ritgen's maneuver), and delivery of the shoulders one at a time, the anterior then the posterior, by lateral flexion of the body.

Technique of the episiotomy:

Episiotomy when indicated was done, at the time of head crowning, using a local anesthesia (10 cm xylocaine), performed with scissor.

There was an assessment of the whole genital tract for the presence of extended episiotomy, perineal tears and its degree.

The standard suture material in the study was absorbable (ETHICON coated vicryl polyglactin 910 violet braided absorbable suture No two-zero, Manufacturer Jhonson and Jhonson Intl).

The Episiotomy in **group A** was closed using the continuous suturing technique (CT) which involves placing three layers of sutures: a continuous non-locking stitch to close the vaginal epithelium. commencing above the apex of the wound and finishing at the level of the fourchette; three or four interrupted sutures to reapproximate the deep and superficial perineal muscles; and subcuticular technique to close the skin.

The Episiotomy in **group B** was closed using the tissue glue technique which involves placing the first stitch above the apex of vaginal trauma to secure any bleeding points that might not be visible. Vaginal trauma, perineal muscles (deep and superficial), and skin are reapproximated with tissue glue.

During the first 12 hours following the delivery, each patient was followed up for the hematoma formation in the wound and perineal pain measured by visual analogue scale (VAS).

At 48 hours and ten days after delivery, each patient was followed up for perineal pain measured by visual analogue scale (VAS). The need for analgesia up to 48 hours after delivery, wound dehiscence and infection. The need for suture removal.

Wound infection was diagnosed by symptoms of wound infection as pain, fever and abnormal discharge from the wound, all patients were asked about these symptoms and were examined for persistent hyperemia, in duration, and tenderness of the wound and possibly purulent discharge along with fever.

Statistical Analysis:

Analysis of data was done by IBM computer using SPSS (statistical program for social science version 12) as follows:

Descriptive statistics:

Mean (X). Standard deviation (SD). Number and percentage for qualitative data.

Analytical statistics:

Student's t-test was used to assess the statistical significance of the difference between two population means in a study involving independent samples. Chi-Square test (X^2) was used to test the association variables for categorical data. Pearson correlation analysis assessing the strength of association between two variables. The correlation coefficient denoted symbolically r, defines the strength and direction of the linear relationship between two variables. The level of p-value: the level of significance was considered according to p-value.

$p>0.05$ = Non-significant (NS) $p<0.05$ = Significant (S). $p<0.01$ = Highly significant (HS)

3. Results

Table (1) shows the number and percent of patients of both method used.

Table (2) shows the age of patients in each group, in continuous group the mean age was 25.1 ± 5.03, while in tissue glue group the mean age was 24.2 ± 4.68 years, it was found that there was no significant difference between the two studied groups regarding age ($p>0.05$).

Table (3) shows the comparison between the two studied groups regarding need of analgesia, it was found that there was a highly significant increase in the number of patients need analgesia in tissue glue technique than the continuous (40% of the patient need analgesia in tissue glue, while only 20% need analgesia in continuous).

Table (4) shows the comparison between the two studied techniques regarding the amount of blood loss (by number of soaked towels), it was found that there was significant increase in the number of soaked towels in the tissue glue group (274) than the continuous group (249).

Table (5) shows the comparison between the two studied techniques regarding the perineal pain at 48 hours and after ten days, it was found there was a highly significant increasing in the number of patient shad a perineal pain after 48 hour and after ten days than the patients in continuous group.

Table (6) shows comparison between the two studied groups regarding wound resuturing after wound gaping after the repair, it was found that there was non significant increase in the number of patients need resuturing in surgical glue than the continuous group (16.7% of the patient need resuturing in tissue glue, while only 13% need resuturing in continuous).

Table (7) shows comparison between the two studied groups regarding incidence of wound infection, it was found that there was non significant increase in the number of patients had wound infection in the tissue glue group than the continuous group (11% of the patient had wound infection in tissue glue group, while only 8.7% had wound infection in continuous group).

Table (8) shows comparison between the two studied groups regarding visual analogue scale (VAS) at different period of follow-up. In women who reported pain, there were lower VAS pain scores in the continuous than in the tissue glue (the mean at 12 hours for continuous 3.21 versus 5.65 for tissue glue group, 3.05 versus 5.22 at 48 hours and 1.818 versus 2.98 at ten day). So there is a highly significant difference after 12 hours and after 48 hours, but there is no significant difference after ten days. As regard wound hematomas, there were no hematomas formed in both groups.

Table (9): Distribution of the studied sample regarding the method of treatment.

	Technique Used	
	Continuous suturing	**Tissue adhesive**
Number of patients	50	50
Percent	50%	50%
Total	100 (100%)	

Table (10): Comparison between the two studied groups regarding age of the patients.

Age (years)	**Continuous**		**Tissue glue**		**T-test**	**P-value**
	No.	**%**	**No.**	**%**		
≤25	30	60%	31	62%		
>25	20	40%	19	38%		
Total	50		50			
Range	23-32		22-30			
Mean	25.1		24.2		0.83	>0.05 (NS)
±S.D	5.03		4.68			

Table (11): Comparison between the two studied groups regarding need of analgesia.

Need of analgesia	**Continuous**		**Tissue glue**		**X^2**	**P-value**
	No.	**%**	**No.**	**%**		
Yes	10	20	20	40		
No	40	80	30	60	11.6	0.0001**
Total	50		50			

Table (12): Comparison between the two studied groups regarding the amount of blood loss (by number of soaked towels)

Blood loss (by towels)	**Continuous**	**Tissue glue**	**Z**	**P-value**
No. of soaked towels	249	274	1.98	0.048

Table (13): Comparison between the two studied technique regarding the perineal pain at 48 hours and after ten days.

Perineal pain	**Continuous**		**Tissue glue**		**X^2**	**P-value**
	No.	**%**	**No.**	**%**		
After 48 hours:						
▪ Yes	26	52	33	66	40.4	0.0001**
▪ No	24	48	17	34		
After 10 days:						
▪ Yes	20	40	29	58	27.8	0.0001**
▪ No	30	60	21	42		
Total	50		50			

**Highly significant difference

Table (14): Comparison between the two studied groups regarding wound resuturing after wound gaping after the repair.

Wound resuturing	Continuous		Tissue glue		X^2	P-value
	No.	%	No.	%		
Yes	7	14	17	34	0.81	0.36
No	43	86	33	66		
Total	50		50			

X^2 = Chi square test N.S = Not significant

Table (15): Comparison between the two studied groups regarding incidence of wound infection.

Incidence of wound infection	Continuous		Tissue glue		X^2	P-value
	No.	%	No.	%		
Yes	5	10	6	12	0.52	0.47
No	45	90	44	88		
Total	50		50			

X^2 = Chi square test N.S = Not significant

Table (16): Comparison between the two studied groups regarding visual analogue scale (VAS) at different period of follow-up.

VAS	Continuous	Tissue glue	t-test	p-value
After 12 hours:				
▪ Range	0-5	0-7	3.25	0.002*
▪ Mean	3.21	5.65		
▪ ±S.D	1.65	2.06		
After 48 hours:				
▪ Range	0-5	0-7	3.69	0.001*
▪ Mean	3.05	5.22		
▪ ±S.D	1.71	2.11		
After ten days:				
▪ Range	0-3	0-4	1.05	0.103
▪ Mean	1.81	2.98		
▪ ±S.D	1.06	1.85		

4. Discussion

This study was designed to compare the effects of continuous sutures versus tissue glue techniques regard short term postpartum maternal morbidity following episiotomy repair after vaginal delivery regarding, perineal pain, amount of blood loss during the repair, wound infection and hematoma formation.

In the present study, the randomization done with opaque envelopes resulted in 50 women in continuous sutures group and 50 women in tissue glue group.

In the present study, the mean participant's age in continuous group was 25.1+ 5.03 and in tissue glue group was 24.2+4.68 years. As regard parity, patients were primigravidae and multigravidae.

None of these groups revealed any statistically significance differences indicating that the two groups were well matched.

The results agreed with previous studies including **Mota et al. [6]; Bowen et al. [7]** who reported that tissue glue group needed less repair time.

The results showed that there was no statistically significant difference detected between continuous and tissue glue groups as regard wound infection (Negative 90% versus 88% - Positive 10% versus 12%).

The results agreed with previous studies including **Mota et al. [6]; Adoni et al. [8]** who reported that there was no statistically significant difference detected between continuous and tissue glue groups as regard wound infection while **Bowen et al. [7]** did not include wound infection as a parameter for the comparison between continuous and tissue glue groups.

The results showed that there was no statistically significant difference detected between continuous and tissue glue groups as regard wound resuturing (Negative 86% versus 66% - Positive 14% versus 34%).

The results agreed with previous studies including **Mota et al. [6];** who reported that there was no statistically significant difference detected between

continuous and tissue glue groups as regard wound resuturing while **Adoni et al.** [8] did not include wound resuturing as a parameter for the comparison between continuous and tissue glue groups.

The results as regard hematoma formation, there was no events of hematoma formation in either groups so there was no statistically significant difference detected between continuous and tissue glue groups as regard wound hematoma formation.

The previous researches including **Mota et al.** [6]**; Bowen et al.** [7]**; Adoni et al.** [8] did not include wound hematoma formation as a parameter for the comparison between continuous and tissue glue techniques.

The results showed that there was a significant increase in the number of patients need analgesia in the first 48 hours in tissue glue technique than the continuous (40% of the patient need analgesia in tissue glue, while only 20% need analgesia in continuous).

Our findings disagree with those of **Mota et al.** [6]**; Bowen et al.** [7] who reported that there was overall reduction in analgesia use in association with the continuous techniques for perineal closure versus tissue glue technique.

The results showed that there was no significant increase in the number of patients had a perineal pain after 48 hr and after ten days in tissue glue technique than the continuous (66% versus 52% after 48 hours - 58% versus 40% after ten days).

The insignificant difference in pain between the suturing methods is believed to be due to insertion of skin sutures into the subcutaneous tissue, thus avoiding nerve endings in the skin surface. For this reason, Gordon et al., 1998 suggested leaving the skin unsutured even in second stage postpartum perineal repair.

Our results agree with those of **Mota et al.** [6]**; Bowen et al.** [7] who published their research on two hundred women who had undergone vaginal deliveries with episiotomies, one group was repaired with continuous sutures and the other group tissue glue technique. The threads used for stitching were identical in both groups. When comparing the group with continuous suture to the group with tissue glue technique, the differences included less repair time.

The results showed that there was a significant increase in the number of towels used in tissue glue group than in the continuous group so there is a significant difference in the amount of blood loss during repair of both groups.

The previous researches including **Mota et al.** [6]**; Bowen et al.** [7]**; Adoni et al.** [8] did not include measuring of amount of the blood loss by number of socked towels as a parameter for the comparison between continuous and tissue glue techniques.

The results showed that there were lower VAS scores in continuous groups than tissue glue groups at 12 hours, 48 hours and after 10 days (mean +standard deviation: 3.21±1.65 versus 5.65±2.06 after 12 hours - 3.05±1.71 versus 5.22±2.11 after 48 hours - 1.81±1.06 versus 2.98 ±1.89 after ten days) So there is a highly significant difference after 12 hours and after 48 hr, but there is no significant difference after ten days.

Our results were in agreement with those of **Mota et al.** [6]**; Bowen et al.** [7]**; Adoni et al.** [8]**;** who reported that there were lower VAS scores in continuous groups than tissue glue groups at 12 hours, 48 hours and after ten days.

Conclusion

In this study we found that skin adhesive devices are more expensive than stitches and so far, no unequivocal demonstration of important clinical advantages has been demonstrated for the former in episiotomy repair.

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