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A prospective cohort multicenter comparison of two episiotomy repair techniques: Skin adhesive strips vs. subcuticular suture

Mohamed I Taema[1]* , Nada Alayed[2]*, Salwa Niazi[2], Khalid Akkour[2], Eman Al Shehri[2], Ibrahim AlHandalishy[3] Osama Deif,[3] Nagy Mohamed Metwally Ahmed[4]

[1]Department of Obstetrics and Gynecology, Ain Shams University, Cairo, Egypt

[2]Department of Obstetrics and Gynecology, College of Medicine, King Saud University, Riyadh, Saudi Arabia

[3]Department of Obstetrics and Gynecology, Faculty of Medicine, Al- Azhar University, Cario, Egypt

[4] Department of Obstetrics and Gynecology, Zagazig University, Zagazig, Sharqeya, Egypt.

SUMMARY

AUTHORS' CONTRIBUTION: (A) Study Design · **(B)** Data Collection . **(C)** Statistical Analysis · **(D)** Data Interpretation · **(E)** Manuscript Preparation · **(F)** Literature Search · **(G)** No Fund Collection

Introduction: Episiotomy is one the most common surgical procedure performed daily. Postoperative pain and wound healing are of great concern to the female.

Aim: To compare the pain, wound healing and the risk of wound infection of adhesive tape versus continuous subcuticular sutures for episiotomy repair after delivery.

Methods: Ninety-six patients were equally divided into two groups. Patients in group 1 had their skin repaired with adhesive tape, whereas those in group 2 had their episiotomies repaired with continuous subcuticular sutures. The two groups were managed in two different hospitals. The primary outcome was Pain at 6 and 12 hours postoperative and one-week post-delivery using Wong-Baker faces pain rating scale. Skin closure time and wound infection were secondary outcomes.

Results: Statistically significant difference in pain after episiotomy repair in favor of the adhesive group (p-value <0.05) after seven days. There is no statistically significant difference between both groups regarding skin closure time and wound infection.

Conclusion: Skin adhesive tape may be better than subcuticular suture in pain perception resulting from episiotomy repair after delivery.

Keywords: Adhesive tape; Continuous sutures; Episiotomy repair; Pain episiotomy

Address for correspondence:

Nada Alayed
Department of Obstetrics and Gynecology, King Saud University, Riyadh, Saudia Arabia
Tel: +966 554403402; E-mail: nalayed@ksu.edu.sa

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INTRODUCTION

Episiotomy was introduced in 1950 as a prophylactic procedure to decrease the risk of vaginal and perineal tears and fasten delivery [1]. In a Cochrane review in 2017, there was no evidence that routine episiotomy has the previously assumed benefits. It concluded that more restricted use of episiotomies would result in lesser women with severe perineal or vaginal trauma [2]. WHO, 2018 recommends episiotomy performance only when there is a solid clinical indication [3]. Perineal tears can cause bleeding, infection and postpartum pain associated with the risk of depression and dyspareunia and adversely affects the quality of life and sexual health [4,5].

Sherif and Al-Shourbagy, 2020 studied the skin adhesive tape on 96 patients in RCT versus interrupted skin sutures. They concluded that Skin adhesive tape could be better than skin suturing in postpartum pain resulting from episiotomy repair after birth [6].

The current study aimed to compare the pain, wound healing, and the risk of wound infection of adhesive tape versus continuous subcuticular sutures for episiotomy repair after delivery.

PATIENTS & METHODS

This study was performed in 2 hospitals in the Kingdom of Saudi Arabia. Ninety-Six women with the same indications of episiotomy (Primigravida or Rigid perineum) were equally divided into two groups—fortyEight patients per Group in each hospital.

Group 1, delivered in one hospital, underwent skin repair with adhesive tape (Steristrips, 3M, coock medical supply). In contrast, another 48 patients in group 2, delivered in the second hospital, underwent episiotomy repair by continuous absorbable subcuticular sutures. Both hospitals are of the same class, and deliveries are handled by the same experienced doctors (Registrars and senior registrars).

The primary outcome was postoperative pain, and oneweek post-delivery using Wong-Baker faces pain rating scale. Wound infection and wound healing assessment using the REEDA score were secondary outcomes.

Sample size justification

All eligible women admitted to the two hospitals between January 2022 and June 2022 who met the inclusion and exclusion criteria were included in the trial. Inclusion criteria include age 18 to 40, term pregnancy, either primigravida or multigravida, in spontaneous or induced labor.

Exclusion criteria include malpresentation such as breech, preterm delivery, multiple pregnancies, suspected macrosomia, polyhydramnios, or cases with oligohydramnios or intrauterine growth restriction in addition to third and fourth-degree perineal tears.

After receiving informed consent, patients underwent a thorough history-taking process (personal, menstrual, detailed obstetric, and past surgical history), examination (general, obstetric, and local pelvic examination), and routine investigations (complete blood count, blood grouping, Rhesus factor, and albumin in urine).

Surgical procedure

Episiotomy: Infiltration with 1% lidocaine and a mediolateral episiotomy was performed when crowning (the fetal head is visible at the vulvovaginal entrance without receding) had taken place.

The scissors were positioned at 7 o'clock, and the incision was extended 3 to 4 cm toward the ischial tuberosity.

Perineal repair following delivery: As soon as the baby was born, an initial examination was made to classify the perineal injuries brought on by the episiotomy. Third and fourth-degree tears were excluded from the study. After thoroughly explaining the operation to the mother, she was put in a posture that allowed for good visualization, her vulval area and perineum were cleaned, and sterile drapes were placed over her. The vagina was inspected, and the apex of the episiotomy or perineal tear was identified. Another infiltration with 1% Lignocaine up to 20mls was applied to the area if needed. A maternity tampon was placed into the upper vagina to stop any uterine bleeding obstructing the surgeon's field of vision. Following clear visualization of the wound's apex, the vagina was sutured, beginning around 0.5 cm above this location, and the vaginal wall was reconstructed using a continuous non-locking stitch.

Upon reaching the hymen, the needle was inserted behind the remaining hymenal tissue before emerging in the perineal muscle's center. After checking the depth of trauma, the perineal muscles were repaired in one or two layers with the same continuous stitch leaving no dead space [9].

Skin Repair: Group 1 Steri-strips (3M™ Steri-Strip™ 6 mm x 100 mm; reinforced skin closure) applied perpendicular to thewound by lifting the skin edges up with gloved fingers, placing the first 1/2 of steri-strip tape at a 90-degree angle over the first edge, pressing firmly, to ensure edges are met together then placing the other half and pressing firmly—3 to 4 tapes placed with approximately 0.5 cm spaces in between.

Group 2 polyglactin 910 (Vicryl Rapid™ 2-0) was used as follows: After repairing the muscular layer, the continuous suture was carried upward as a subcuticular stitch, and the final knot was tied at the end of the cut.

Outcome measures

As the effectiveness of local injectable lidocaine lasts on average from 45 minutes to 1 hour [10], all participants were evaluated for pain 6 hours, 12 hours, and seven days after delivery, using Wong-Baker faces pain rating scale with verbal expression for pain intensity.

All participating women were given a brief explanation before being discharged and were then told to cover the steri-strip area with a dressing to prevent the steri-strips from getting wet and coming off. They were also told to return and have the steri-strips replaced if they became moist and fell out.

Patients were instructed to complete a home daily postnatal pain score chart of 7 days using the same scale. At their first postpartum visit (seven after delivery), the results of the first seven days' charts were reviewed and documented, and all women were examined. Their wounds were evaluated for signs of wound healing and infection using the REEDA scores (redness, edema, ecchymosis, discharge, and wound approximation). They were asked to complete a second questionnaire, evaluating their satisfaction depending on pain intensity during daily activities using the same pain scale.

Statistical analysis

Numerical data were explored for normality by checking the distribution of data and using tests of normality (Kolmogorov-Smirnov and Shapiro-Wilk tests). Data were presented as median and range values. For non-parametric data Mann-Whitney U test were used to compare between the two groups. Qualitative data was done by using Chi-square test or Fisher's exact test, when appropriate. The significance levels were set at $P \leq 0.05$. Statistical analysis was performed with IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY:IBM Corp.

RESULTS

Tab. 1. shows no statistically significant difference in the demographic data between the two group. **Tab. 2.** demonstrates no statistically significant difference in pain scores at 6 and 12 hours after the procedure between the adhesive strip and suture closure groups. However, seven days postpartum, there was a statistically significant difference in pain scores ($p<0.03$). **Tab. 3.** shows the REEDA score healing assessment seven days after birth. The data shows no statistically significant difference between the two groups regarding redness, edema, ecchymosis, discharge, and approximation in wound healing assessment.

DISCUSSION

The effect of local anesthetic administered prior to episiotomy and analgesia administration can be used to explain why the current study found no significant difference in pain 6 hours and 12 hours after birth. Seven days after delivery, our findings revealed a significant difference in pain score favoring the adhesive tape group; this finding might result from an exaggerated body reaction to the sutures. However, the second evaluation using the REEDA score revealed no differences between the two groups, and neither group had any wound infections. The duration of skin closure was also insignificantly different between the two groups, despite the adhesive tape group having a longer duration, which could be explained by the fact that more operators had experience with skin suturing.

In their 2020 study, Sherif and Al-Shourbagy compared interrupted skin sutures to skin adhesive tape on 96 patients. They found considerably less postpartum pain from episiotomy repair in patients who had skin repair using adhesive tape than in patients who underwent skin suturing [6]. This is consistent with the findings of our investigation.

Kindberg et al. compared interrupted, inverted stitches with continuous stitches for perineal repair and leaving the skin without suturing. They concluded that all three techniques appear to be equivalent. They also found no difference in the REEDA score for wound healing at 24-48 hours and ten days postpartum, similar to the current study's REEDA score [7]. In other studies, Ghosh et al. reported wound closure with adhesive tape to be easier and faster, although the results were insignificant when compared to intracuticular suture closure after coronary artery bypass grafting; however, there was significantly less redness and edema in the adhesive tape group [8].

Tab. 1. Difference between adhesive strip group and vicryl suture closure and regarding the demographic data.

Variables	Group 1 [Adhesive strip Group] (n=48)	Group 2 [Suture closure Group] (n=48)	*Test value*	*P*
Age (Years)				
Range	19 – 38	18 – 39	*U:*1.672	0.152
Median (IQR)	27 (21.8–32)	29 (23–33)		
Gestation at Delivery (weeks)				
Range	38 – 41	38 -41	*U:*0.731	0.633
Median (IQR)	39.6 (38.8 – 40.4)	39.7 (38.8 – 40.3)		
Number of cases with uncomplicated episiotomy	28 (58.3%)	30 (62.5%)	x^2:0.175	0.676
Number of cases with episiotomy complicated by 1st & 2nd degree perineal tear	20 (41.7%)	18 (37.5%)	x^2:0.175	0.676
U: Mann-Whitney U-test; Chi-square test; p-value >0.05 is insignificant				

Tab. 2. Difference between suture closure and adhesive strip group regarding pain evaluation in the 1st day after birth.

Pain score	Group	No	Mild	Moderate	Severe	Very Severe	Worst Pain	X^2	P
6 hours	Suture	0 (0.0%)	19 (39.6%)	26 (54.2%)	3 (6.3%)	0 (0.0%)	0 (0.0%)	3.378	0.337
	Adhesive	1 (2.1%)	26 (54.2%)	19 (39.6%)	2 (4.2%)	0 (0.0%)	0 (0.0%)		
12 hours	Suture	0 (0.0%)	19 (39.6%)	25 (52.1%)	4 (8.3%)	0 (0.0%)	0 (0.0%)	1.137	0.566
	Adhesive	0 (0.0%)	24 (50.0%)	20 (41.7%)	4 (8.3%)	0 (0.0%)	0 (0.0%)		
7 days	Suture	18 (37.5%)	23 (47.9%)	7 (14.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	6.509	0.039*
	Adhesive	27 (56.3%)	20 (41.7%)	1 (2.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)		
Chi-square test; p-value >0.05 is insignificant; *p-value <0.05 is significant									

Tab. 3. REEDA score healing assessment in the 2nd visit (7 days after birth).

Score	Group	0	1	2	X^2	P
Redness	Suture	23 (47.9%)	25 (52.1%)	0 (0.0%)	0.042	0.838
	Adhesive	25 (52.1%)	23 (47.9%)	0 (0.0%)		
Edema	Suture	46 (95.8%)	2 (4.2%)	0 (0.0%)	0.000	1.000
	Adhesive	46 (95.8%)	2 (4.2%)	0 (0.0%)		
Ecchymosis	Suture	48 (100.0%)	0 (0.0%)	0 (0.0%)	--	--
	Adhesive	48 (100.0%)	0 (0.0%)	0 (0.0%)		
Discharge	Suture	48 (100.0%)	0 (0.0%)	0 (0.0%)	--	--
	Adhesive	48 (100.0%)	0 (0.0%)	0 (0.0%)		
Approximation	Suture	47 (97.9%)	1 (2.1%)	0 (0.0%)	0.000	1.000
	Adhesive	47 (97.9%)	1 (2.1%)	0 (0.0%)		
Total	Suture	22 (45.8%)	23 (47.9%)	3 (6.3%)	1.043	0.594
	Adhesive	23 (47.9%)	24 (50.0%)	1 (2.1%)		
Chi-square test; p-value >0.05 is insignificant						

Feigenberg et al. compared adhesive glue to sutures on a heterogeneous sample of primiparous and multiparous women, totaling 100 and 97, respectively. Their results supported the potential benefits of glue used as a better alternative to sutures in terms of procedure time and reduced pain sensation, though there was no statistically significant difference between the two groups at 7 and 30 days [9]. However, the cost of glue use may be an issue, especially in a developing country with limited resources.

Lazar et al. reported increased pain sensation in the sutured arm when comparing skin adhesive tape to suturing the skin in surgeries other than obstetrics [10]. The main limitation of this study is an inadequate number of patients, as Arab women's backward Islamic culture limits their participation in clinical trials. Also, most patients reject employing adhesive tape to close wounds without stitching. Another limitation of this study is the lack of randomization.

Further studies are needed to determine the most efficient method of episiotomy skin closure, particularly in terms of postoperative pain and wound healing.

CONCLUSION

Skin adhesive tape may be superior to skin suturing in decreasing perineal pain after episiotomy repair.

ETHICS APPROVAL

The ethical Committees of two hospitals approved the study.

CONSENT FOR PUBLICATION

Not applicable

AVAILABILITY AND DATA MATERIAL

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

COMPETING INTERESTS

The authors report there are no competing interests to declare

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