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Study of the relationship between mediolateral episiotomy in vaginal delivery and pelvic organ prolapse in pregnant mothers

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Abstract

Pelvic Floor Disorders (PFDs) are a group of disorders of the female reproductive system that can cause a variety of problems for women. PFDs can include Urinary Incontinence (UI) and Pelvic Organ Prolapse (POP). This study evaluated the association between mediolateral episiotomy during pregnancy and POP in patients. A cross-sectional study with prospective follow-up was conducted on 150 pregnant women admitted for vaginal delivery at Furqani Hospital in Qom, Iran. Participants were divided into episiotomy and non-episiotomy groups based on clinical indications. Pelvic organ prolapse was assessed using the Pelvic Organ Prolapse Quantification (POP-Q) system at baseline and 3-6 months postpartum. Data were analyzed using SPSS version 26, with a significance level of 0.05. The study included 142 patients with a mean age of 29.67 years. No significant differences were observed in demographic or clinical variables between the episiotomy and non-episiotomy groups at baseline. Postpartum, the episiotomy group showed significant improvements in cystocele severity (P=0.038), rectocele severity (P=0.026), apical prolapse (P=0.011), levator tone (P=0.016), and perineal descent (P=0.016). However, the cough test results did not differ significantly (P=0.052). Mediolateral episiotomy during vaginal delivery was associated with reduced severity of POP and improved PFD. These findings suggest a potential protective effect of episiotomy against certain pelvic floor complications, although further studies with larger sample sizes and longer follow-up periods are needed to confirm these results.

Key Words: episiotomy, pelvic organ prolapse, vaginal delivery, pregnancy.

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Pelvic Floor Disorders (PFDs) are a group of disorders related to the female genital area. PFDs can include Urinary Incontinence (UI) and Pelvic Organ Prolapse (POP).[1] According to published statistics, approximately 338,000 surgeries are performed annually on patients with PFDs. Various factors are involved in the occurrence of PFDs and POP. One of the main factors is vaginal delivery.[1,2]

For successful vaginal delivery, gradual dilation of both the vagina and cervix is required, and tissues must be stretched properly. During this process, spontaneous perineal tears may arise with rapid fetal descent, particularly during the descent of the fetal head and the consequent vaginal distension. Another etiology of vaginal lacerations during childbirth is controlled and properly performed perineal incisions at the culmination of the second stage of labor, aimed at facilitating delivery through increasing the vaginal diameter; this procedure is clinically termed episiotomy.[3-5] Despite the widespread practice of episiotomy, standardization in its application and repair is currently lacking. Research to date has not identified factors influencing healing and long-term consequences, particularly concerning the efficacy of episiotomy in preventing future PFDs. Initially introduced in 1921 for fetal and maternal protection, episiotomy, specifically the mediolateral type in first-time mothers, was believed to offer advantages over spontaneous tears. These perceived benefits included easier repair, reduced short-term risk of severe lacerations, and protection against long-term pelvic floor dysfunction, as well as neonatal advantages such as decreased birth-related

trauma. Consequently, episiotomy became increasingly prevalent until the mid-20th century and was liberally performed until the late 1980s under the assumption that it prevented perineal overextension and subsequent pelvic floor weakness.[6] However, subsequent randomized controlled trials have demonstrated that episiotomy fails to deliver the maternal and neonatal benefits purported by its proponents.[7,8] Furthermore, it has been shown to expose patients to an elevated risk of perineal body injury and anal sphincter damage.[9] Indeed, during the latter half of the twentieth century, a growing body of evidence began to surface, indicating that episiotomy did not, in fact, confer these advantages.[10] Subsequently, Thacker and Banta conducted a review of pertinent studies undertaken between 1860 and 1980, analyzing the findings to ascertain whether episiotomy provided any demonstrable benefits. Consequently, they reported that the available body of research was insufficient, and the studies lacked adequate methodological rigor to conclusively validate their hypotheses. Therefore, the findings did not support the routine utilization of episiotomy. Furthermore, postpartum pain and discomfort were evident and represented significant complications, with maternal mortality, albeit rare, also identified as a potential consequence of episiotomy. In response to mounting concerns and evidence, the American College of Obstetricians and Gynecologists (ACOG) subsequently recommended the selective use of episiotomy in carefully selected patients. The impact of episiotomy on Pelvic Floor (PF) function has been investigated in several questionnaire-based studies.[11] A meta-analysis, synthesizing the findings of these studies, reported that episiotomy was not associated with a decreased risk of pelvic floor dysfunction-related complaints, including UI, fecal incontinence or flatus incontinence, and sexual dysfunction.[12] The use of vaginal delivery has fewer complications for mothers compared to cesarean section. However, vaginal delivery has been shown to be a factor in the occurrence of POP in patients. However, the relationship between mediolateral episiotomy during vaginal delivery and the occurrence of POP in pregnant women has been limited, so we investigated this issue in this study.

Materials and Methods

Ethical subject and collected inform consent

This study employed a cross-sectional design with a prospective follow-up component. The 150 patients were randomly selected from the patient population in Qom City. Following protocol approval by the Faculty of Medicine Research Council and ethical clearance (ethics code IR.MUQ.REC.1402.045) from the Research Ethics Committee of Qom University of Medical Sciences, and after coordination with the hospital and obtaining consent from the medical staff, data collection commenced.

Inclusion and exclusion criteria

Inclusion criteria encompassed all pregnant mothers admitted to Furqani Hospital who were eligible for vaginal delivery and provided informed consent to participate. Mothers who declined participation or underwent cesarean delivery based on physician discretion were excluded from the study.

Procedure

At baseline, researchers examined all mothers for POP using the Pelvic Organ Prolapse Quantification (POP-Q) system and recorded the Aa, Ba, Ap, Bp, D, C points, Total Vaginal Length (TVL), genital hiatus, and perineal body measurements. Subsequently, during the follow-up phase (3 to 6 months postpartum), mothers who had vaginal deliveries were re-evaluated using POP-Q, and the aforementioned parameters were remeasured. The allocation of mothers into episiotomy and non-episiotomy groups was not randomized. The decision to perform episiotomy was based on the gynecologist's clinical judgment and was selective. Mothers with clinical indications for episiotomy during vaginal delivery received an episiotomy, while others delivered without episiotomy. The researchers had no intervention in the episiotomy decision-making process.

Statistical analysis

The sample size calculation, considering an anticipated correlation coefficient (R) of 0.24 between episiotomy and pelvic organ prolapse, a statistical power of 80%, and a 95% confidence interval, determined a minimum required sample size of 135 participants. Finally, the data collected from both time points (baseline and follow-up) were entered into SPSS software version 26 and subjected to analysis and comparison. It is important to note that no additional costs were incurred by patients during the study, and written informed consent was obtained from all participants. The statistical significance level was set at 0.05.

Results

Description data of patients

Table 1 compared various demographic and clinical factors between women who underwent episiotomy and those who did not. The mean age of participants was similar in both groups (29.4±2.6 *vs.* 29.8±2.5, p=0.401), indicating no significant difference in age distribution. Similarly, BMI showed a trend toward higher values in the non-episiotomy group (26.3±1.8 *vs.* 27.05±2.1, p=0.068), though this did not reach statistical significance. Gravidity and parity were also comparable between the two groups (Gravidity: 2.28±1.1 *vs.* 2.36±1.1, p=0.608; Parity: 1.1 *vs.* 0.9, p=0.665), suggesting no significant differences in obstetric history. The prevalence of addiction was low and did not differ significantly between groups (1.4% *vs.* 2.1%, p=0.771). The presence of underlying diseases was slightly higher in the episiotomy group (7.7% *vs.* 7.7%, p=0.055), though this difference was not statistically significant. Ethnicity (Iranian *vs.* non-Iranian) and neonatal gender (boy *vs.* girl) also showed no significant differences between the groups (p=0.578 for both). Finally, neonatal weight was nearly identical in both groups (3266.7±91.8 *vs.* 3271.9±90.4, p=0.748), indicating no significant difference in birth weight.

Association between pelvic floor characteristics and pre-episiotomy

The study evaluated pelvic floor characteristics and their association with episiotomy, based on pre-episiotomy assessments. The severity of cystocele showed no significant difference between the episiotomy and non-episiotomy groups, with the majority of cases classified as Stage 1 (27 *vs.* 63, p=0.771) and Stage 2 (19 *vs*. 32), while Stage 3 was rare (0 *vs*. 1). Similarly, the severity of rectocele did not differ significantly, with most cases being Stage 1 (30 *vs*. 67, p=0.584) and Stage 2 (16 *vs*. 29). Apical prolapse also showed no significant variation, with Stage 1 being the most common (34 *vs*. 76, p=0.483) and Stage 2 less frequent (12 *vs*. 20). Levator tone was predominantly moderate in both groups (29 *vs*. 62, p=0.862), with severe tone observed in a smaller proportion (16 *vs*. 33) and mild tone being rare (1 *vs*. 1). The cough test results were similar, with no significant difference in positive (8 *vs*. 20, p=0.629) or negative (38 *vs*. 76) outcomes. Perineal descent was also comparable, with no significant difference in positive (10 *vs*. 11, p=0.547) or negative (36 *vs*. 85) findings (Table 2).

Association between pelvic floor characteristics and post-episiotomy

The findings in Table 3 indicate that episiotomy is significantly associated with the severity of cystocele (P=0.038) and rectocele (P=0.026), with more advanced stages of cystocele and rectocele being more prevalent in patients without episiotomy. Additionally, episiotomy was also linked to the severity of apical prolapse (P=0.011) and reduced levator muscle tone (P=0.016). The results of the cough test (P=0.052) and perineal descent (P=0.016) also showed differences between the two groups, although the association with the cough test was not statistically significant at the 0.05 level. Overall, these findings suggest that episiotomy may be associated with a reduction in some pelvic prolapse-related complications after childbirth, but further studies are needed to confirm these results.

Discussion

A total of 142 patients were examined, with a mean age of 29.67 years, a mean BMI of 26.83, and a mean neonatal weight of 3270.28 grams. Additionally, the mean gravidity and parity of the studied patients were 2.33 and 1.06, respectively. The analysis of the mean values of quantitative variables (age, BMI, gravidity, parity, neonatal weight) and background variables (tobacco use, underlying medical conditions, ethnicity, neonatal sex) revealed no statistically significant differences between the two groups of mothers with and without episiotomy. Furthermore, the severity of cystocele, rectocele, and apical vaginal prolapse before episiotomy was also compared among the patients, and no statistically significant differences were found between the two groups. However, after episiotomy, all three variables—cystocele severity, rectocele severity, and apical vaginal prolapse—showed statistically significant differences. Regarding levator tone, cough test, and perineal descent, no significant differences were observed between the two groups before episiotomy. However, after episiotomy, both levator tone and perineal descent showed

Table 1. *Comparative analysis of demographic and clinical factors in women with and without episiotomy.*

		Episiotomy		P value
		Yes	No	
Age		29.4±2.6	29.8±2.5	0.401
BMI		26.3±1.8	27.05±2.1	0.068
Gravid		2.28±1.1	2.36±1.1	0.608
Parity		0.9	1.04±0.8	0.665
Addiction	Yes	2 (1.4)	3 (2.1)	0.771
	No	44 (31)	93 (65.5)	
Underlying disease	Yes	11 (7.7)	11 (7.7)	0.055
	No	35 (24.6)	85 (59.9)	
Race	Iranian	36 (25.4)	71 (50)	0.578
	Non Iranian	10 (7)	25 (17.1)	
Gender (neonate)	Boy	19 (13.4)	38 (26.8)	0.578
	Girl	27 (19)	58 (40.8)	
Weight (neonate)		3266.7±91.8	3271.9±90.4	0.748

statistically significant differences. Specifically, the severity of levator tone and the incidence of perineal descent were significantly reduced in mothers who underwent episiotomy. Although there was a difference in the results of the cough test between the two groups, this difference was not statistically significant. In total, no internal or external studies were found that were entirely similar to the present study. Among the strengths of the current study is its methodology, wherein the researchers not only evaluated pelvic prolapse indicators before and after episiotomy but also

Table 2. *Pre-episiotomy pelvic floor characteristics: a comparative analysis of women with and without episiotomy.*

		Episiotomy		P value
		Yes	No	
Severity of cystocele	Stage 1	27	63	0.771
	Stage 2	19	32	
	Stage 3	0	1	
Severity of Rectocele	Stage 1	30	67	0.584
	Stage 2	16	29	
Apical prolapse	Stage 1	34	76	0.483
	Stage 2	12	20	
Levator tone	Mild	1	1	0.862
	Moderate	29	62	
	Severe	16	33	
Cough test	Pos	8	20	0.629
	Neg	38	76	
Perineal descent	Pos	10	11	0.547
	Neg	36	85	

Table 3. *Post-episiotomy pelvic floor characteristics: a comparative analysis of women with and without episiotomy.*

		Episiotomy		P value
		Yes	No	
Severity of cystocele	Stage 1	41	74	0.038
	Stage 2	5	25	
	Stage 3	0	1	
Severity of Rectocele	Stage 1	40	60	0.026
	Stage 2	6	29	
Apical prolapse	Stage 1	44	76	0.011
	Stage 2	2	20	
Levator tone	Mild	5	1	0.016
	Moderate	30	62	
	Severe	11	33	
Cough test	Pos	4	21	0.052
	Neg	42	75	
Perineal descent	Pos	1	4	0.016
	Neg	45	92	

included a control group for comparative analysis between the case and control groups. This aspect is a notable strength of the present study, as it was not observed in other similar studies. As for the limitations, the follow-up period of 3 to 6 months postpartum for reassessing pelvic prolapse indicators could be considered a weakness. Extending this duration to evaluate the long-term outcomes of these indicators would be beneficial. Additionally, future studies with larger sample sizes could investigate pelvic prolapse indicators alongside complications of vaginal delivery, such as urinary and anal incontinence, which was not feasible in the current study. Nevertheless, the following section will review and compare the results of the studies most closely related to the present one. In a similar study, Hakan Aytan and colleagues reported that episiotomy had an impact on certain POP-Q indicators but did not affect the overall POP-Q stage.[13] In our study, it was also found that episiotomy positively influenced POP-Q indicators, and this effect was significantly higher compared to the group without episiotomy. In another study, Frigerio and colleagues stated that they found no evidence of a long-term beneficial effect of episiotomy in preventing urinary incontinence symptoms or anti-incontinence surgery. It does not appear that episiotomy negatively affects the development of genital prolapse and may even offer protection against the severity and prevalence of prolapse without influencing surgical rates.[14] However, in our study, episiotomy led to an improvement in pelvic prolapse symptoms, which contrasts with the findings of Matteo Frigerio's study. This discrepancy could be due to various reasons, such as differences in sample size, geographical location, study design, and other factors. In yet another study, Bülent Doğan and colleagues concluded that vaginal delivery with mediolateral episiotomy was not associated with an increase in pelvic prolapse symptoms.[15] The findings of our study not only did not indicate an increase in pelvic prolapse symptoms in the episiotomy group but also revealed that the pelvic prolapse indicators were significantly better, statistically, in the group that underwent episiotomy compared to the group without episiotomy. This aligns with the findings of Bülent Doğan's study. In another study, Sartore, Andrea, and colleagues concluded that mediolateral episiotomy does not protect against urinary and anal incontinence or genital prolapse and, compared to spontaneous perineal tears, is more frequently associated with dyspareunia, perineal pain, and lower pelvic floor muscle strength.[7] In our study, postpartum incontinence in women was not examined, but the pelvic prolapse indicators were significantly better in the group that underwent episiotomy compared to the group that did not. It seems that this discrepancy between our results and those of Sartore, Andrea could be due to differences in sample size, study location, or the use of different diagnostic tools.

This study has a number of limitations and strengths. This study was cross-sectional and the assessment was conducted on patients and, unlike previous studies, was not retrospective. It is better to conduct a study on a larger statistical population in future studies. Also, the incidence of POP should be evaluated based on the age of the patients.

Conclusions

Ultimately, the results of this project indicated that mediolateral episiotomy in vaginal delivery is associated with pelvic organ prolapse in pregnant women and contributes to a reduction in these complications postpartum. However, there remains a divergence of opinion regarding the positive impact of episiotomy on pelvic organ prolapse. Given the conflicting findings across multiple studies, it is still unclear whether episiotomy has a long-term effect on pelvic floor relaxation and pelvic organ descent.

Conflict of interest

The authors declare no potential conflict of interest, and all authors confirm accuracy.

Ethics approval and consent to participate

All the procedures performed in the study involving human participants were in accordance with ethical standards of the local ethics committee of Qom University of Medical Sciences (IR.MUQ.REC.1402.045), as well as 1964 Helsinki declaration.

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

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