

P R A C E O R Y G I N A L N E  
położnictwo

# The role of episiotomy in prevention of genital lacerations during vaginal deliveries – results from two european centers

Rola nacięcia krocza w profilaktyce uszkodzeń podczas porodów pochwowych – wyniki z dwóch ośrodków europejskich

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## Abstract

**Objectives:** There is an ongoing debate regarding the routine versus restrictive use of episiotomy. The study aim was to investigate if episiotomy during vaginal deliveries can reduce both, the number and severity of genital lacerations.

**Material and methods:** The study included all women who gave vaginal birth at AOU. "G. Martino" Messina (n=382) and the Clinic for Ob/Gyn Clinical Center of Serbia, Belgrade (n=4221) during 2011. Lacerations during birth were recorded and divided according to location and severity. Women with lacerations were subdivided into two groups: with or without medio-lateral episiotomy. We assessed potential risk factors for laceration: maternal age, parity, use of labor stimulants and epidural analgesia, participation in antenatal classes, fetal presentation, neonatal birth weight, and duration of the second stage of labor.

**Results:** Older women had higher grade perineum or combined lacerations. Children with higher birth weight in occipito-posterior presentation caused higher grade lacerations. Performance of episiotomy was connected with fewer perineum and labial lacerations. There were no differences in laceration grade between patients with and without episiotomy. Assessed parameters proved to be good discriminating factors between lacerations sites. According to logistic regression, laceration site was the most important risk factor for laceration grade. Combined lacerations had the highest grade.

**Conclusions:** Episiotomy can significantly reduce the number of genital lacerations, but it does not influence laceration grade. Advanced maternal age, higher parity, occipito-posterior presentation and fetal macrosomia can cause lacerations during vaginal birth. Therefore, we suggest analysis of maternal and fetal factors to prevent wide-spread genital lacerations.

Key words: **episiotomy / genital lacerations / vaginal delivery / laceration risk factors /**

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## Streszczenie

**Cel:** Trwa debata w sprawie właściwego stosowania nacięcia krocza: regularne kontra ograniczone. Celem badania była ocena czy nacięcie krocza podczas porodu pochwowego może zredukować zarówno liczbę jak i ciężkość uszkodzeń krocza.

**Materiał i metoda:** Do badania włączono wszystkie kobiety, które w 2011 roku urodziły drogą pochwową w ośrodku w AOU „G.Martino” Messina (n=382) i w Klinice Położniczo-Ginekologicznej w Serbii, w Belgradzie (n=4221). Uszkodzenia krocza podczas porodu zostały podzielone względem lokalizacji i ciężkości. Kobiety z uszkodzeniami podzielono na dwie podgrupy: z nacięciem i bez nacięcia pośrodkowo-bocznego krocza. Oceniono możliwe czynniki ryzyka uszkodzeń krocza: wiek matki, rodność, użycie stymulacji porodu, znieczulenie zewnątrzoponowe, uczestnictwo w szkole rodzenia, położenie płodu, masa urodzeniowa noworodka, czas trwania drugiej fazy porodu.

**Wyniki:** Starsze kobiety miały wyższy stopień uszkodzenia krocza i bardziej złożone pęknięcia. Urodzenie dziecka z większą masą urodzeniową w ułożeniu potylicowym-tylnym powodowało wyższy stopień pęknięć krocza. Nacięcie krocza wiązało się z mniejszą ilością pęknięć krocza i warg sromowych. Nie zanotowano różnic w stopniu uszkodzenia krocza pomiędzy pacjentkami z i bez nacięcia krocza. Oceniane czynniki są przydatne w różnicowaniu miejsca uszkodzenia. Na podstawie regresji logistycznej, miejsce pęknięcia było najważniejszym czynnikiem ryzyka stopnia uszkodzenia krocza. Złożone uszkodzenia miały najwyższy stopień.

**Wnioski:** Nacięcie krocza istotnie zmniejszało liczbę uszkodzeń krocza, lecz nie wpływało na ich stopień. Zaawansowany wiek matki, wyższa rodność, ułożenie potylicowe-tylne i makrosomia płodu mogą powodować pęknięcia krocza w trakcie porodu. Sugerujemy analizę matczyńskich i płodowych czynników ryzyka celem zapobiegania szkodliwym uszkodzeniom krocza w trakcie porodu.

Słowa kluczowe: **nacięcie krocza / pęknięcie krocza / poród pochwowy /  
/ czynniki ryzyka pęknięcia krocza /**

## Introduction

There are several techniques to prevent perineum trauma during vaginal delivery, with episiotomy being one of, if not the most, important examples [1]. Nowadays episiotomy is among the most common procedures performed in obstetrics [2]. In the second half of the 20th century its use became so widespread that it was almost regarded as a standard procedure in labor rooms. The most common indication for episiotomy, apart from fetal wellbeing, is prevention of vaginal, perineum and anal ruptures or lacerations. However, in recent years its usefulness and relevance, in particular its routine widespread use, have been increasingly questioned. Extensive use of episiotomy may even result in severe perineum lacerations and cause grave complications in the post-partum period such as perineum floor weakening that results in genital prolapse and incontinence [2, 3]. Thus, the debate regarding a routine versus restrictive use of episiotomy continues. The aim of our study was to investigate if episiotomy performed during vaginal delivery can reduce both, the number and severity of genital lacerations.

## Material and methods

The study included all women who gave vaginal birth at A.O. U. “G. Martino” hospital in Messina, Italy and the Clinic for Gynecology and Obstetrics, Clinical Center of Serbia, Belgrade, Serbia, in the course of 2011. The inclusion criteria were: singleton pregnancy, cephalic presentation, term gestation (37-41 weeks of gestation), and vaginal birth without the use of forceps or vacuum. Exclusion criteria were: excessive fetal weight and/or fetal macrosomia (>4500 grams), previous severe lacerations (grade III-IV) or history of caesarean sections. We recorded the existence of lacerations during birth and divided them according to site (vaginal, perineum, labial or combined

and severity (perineum lacerations - grade I to IV). Women who had lacerations were further subdivided into two groups: with or without episiotomy. All episiotomies were right medio-lateral, with incision at 45°, as that is the type of episiotomy performed in our clinics. The incisions did not exceed 4cm in length and 3cm in depth. Moreover, we assessed the influence of potential risk factors for laceration such as: maternal age, parity, use of labor stimulants and epidural analgesia, antenatal classes, fetal presentation and neonatal birth weight and duration of the second stage of labor. Every labor was conducted or supervised by an experienced OB-GYN consultant. In both hospitals at the time of expulsion the women were placed in the lithotomy position and a midwife was actively giving adequate support of the fetal head. No specific lubricant was used during labor in the examined population. Data were compared and analyzed by methods of descriptive and analytical statistics (Spearman’s correlation,  $\chi^2$  test, Kruskal-Wallis test, logistic regression, discriminant analysis).

## Results

In the course of 2011, there were 4221 vaginal term singleton births with cephalic presentation in Belgrade. Out of them, episiotomy was performed during 74.25% of births and there were 28.97% cases of lacerations. In the Italian population, there were 382 vaginal births compliant with the inclusion criteria for our study. Out of them, episiotomy was performed during 48.69% births and there were 46.60% cases of lacerations. Fifteen women who gave birth to newborns heavier than 4500 grams and 7 gravidas with a history of caesarean sections were excluded from the Belgrade group. Finally, we further analyzed 1393 women (1215 + 178) with lacerations during labor. The population characteristics are presented in Figure 1.

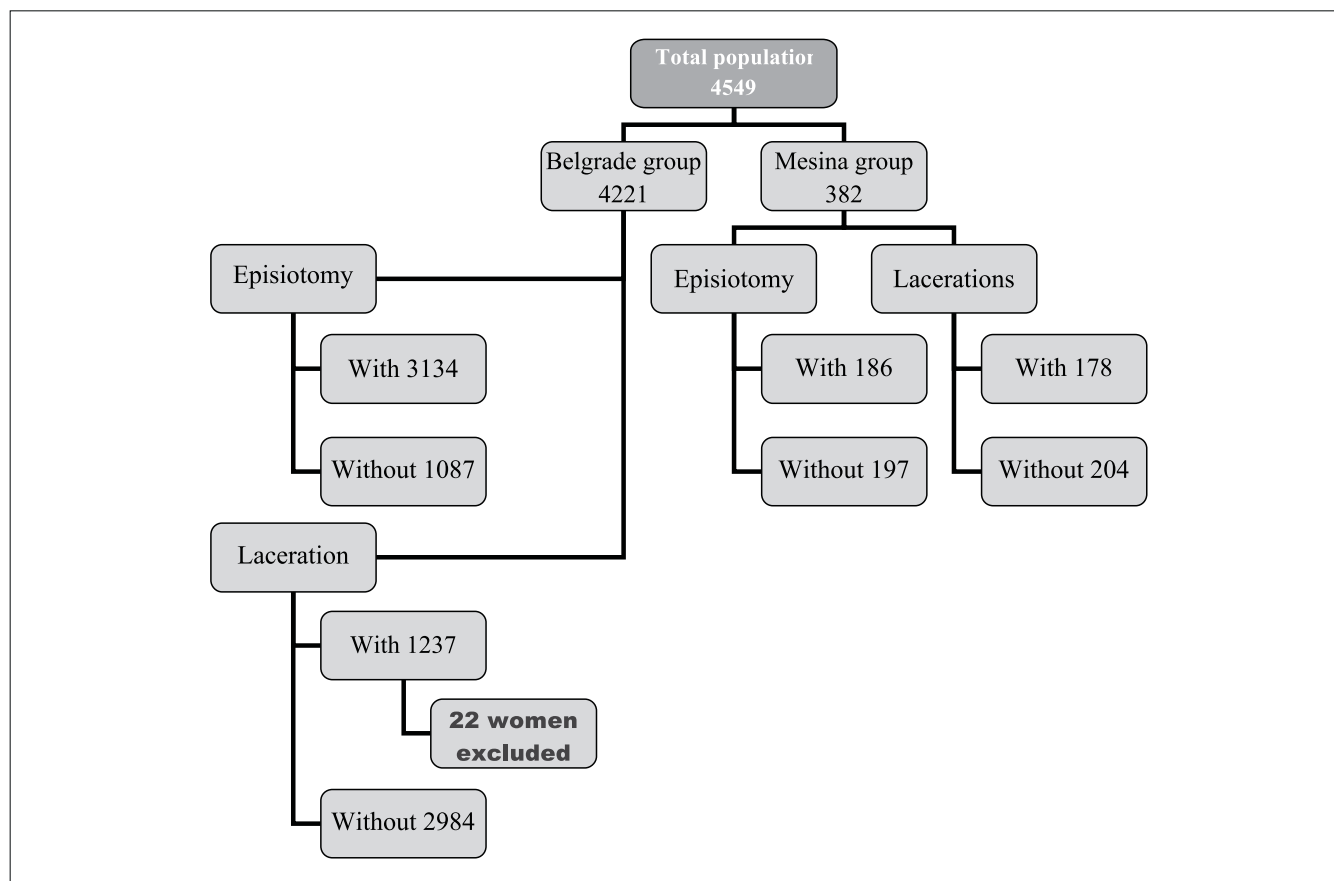


Figure 1. Investigated population structure.

Maternal age ranged from 16 to 43. Women with episiotomy were significantly younger than those who did not have episiotomy ( $KW\chi^2= 3.411$ ;  $p=0.001$ ) (Table I). Women who had lacerations of the higher grade were significantly older. Women with vaginal or labial lacerations were younger than those who had perineal or combined lacerations (Table II).

The weight of the newborns ranged from 2270 grams to 4500 grams. Women who had episiotomy gave birth to heavier children as compared to those without episiotomy ( $KW\chi^2= 4.117$ ;  $p=0.001$ ). Heavier children caused lacerations of significantly higher grade (Table II).

In the examined population, the second stage of labor lasted on average 35 minutes +/- 12 min. There were no significant differences regarding the duration of the second stage of labor between women with and without episiotomy ( $KW\chi^2= 0.237$ ;  $p=0.351$ ) (Table I). Additionally, no significant differences were found with regard to laceration grade or site and the duration of the second stage of labor (Table II).

The investigated women had given between 1 to 4 births, but the majority were secundiparas ( $\chi^2=1378.425$ ;  $p=0.001$ ). There were significantly more secundiparas in the group without and significantly fewer tertiparas in the group with episiotomy ( $p=0.001$ ). Episiotomy was usually performed for primiparas (Table III).

Primiparas had mostly grade II vaginal lacerations (Table II). Less than 10% of the children were in the occipito-posterior presentation ( $\chi^2=2578.741$ ;  $p=0.001$ ). There were no significant

differences between women with and without episiotomy regarding fetal presentation (Table III). There were significantly more grade III lacerations in these patients, although no significant differences regarding laceration site were observed (Table II).

Among the investigated women who had lacerations at labor, there were significantly more women without episiotomy ( $\chi^2=394.172$ ;  $p=0.001$ ).

In the overall investigated population, there were significantly more women with perineum lacerations and significantly fewer women with lacerations in the labia ( $\chi^2=396.993$ ;  $p=0.001$ ). There were significantly more women with grade I lacerations, while only 29 grade II and 25 grade III laceration cases were registered ( $\chi^2=2471.347$ ;  $p=0.001$ ). Combined lacerations were of higher grade (Table II). Significant differences between groups of women with and without episiotomy were registered regarding the laceration site. There were significantly more perineum lacerations in the group without episiotomy and significantly fewer labial lacerations in the group with episiotomy. There were no significant differences regarding the laceration grade between women with or without episiotomy performed during labor (Table II and III).

A majority of patients had labor stimulation (5IJ Oxytocin in 500ml 5% Glucose solution) ( $\chi^2=1073.747$ ;  $p=0.001$ ). Nevertheless, there were no significant differences between women with and without episiotomy regarding labor augmentation (Table III). Besides, there were no significant differences in the laceration grade or site with regard to labor stimulation (Table II).

Antonio Simone Laganà et al. *The role of episiotomy in prevention of genital lacerations during vaginal deliveries – results from two european centers.***Table I.** Descriptive data of patient population.

Parameters	All women		Episiotomy				p
			With		Without		
	Mean	SD	Mean	SD	Mean	SD	
Maternal age	29.38	5.17	27.25	5.15	29.66	5.14	0.001
Baby weight gram	3389.82	416.77	3419.67	433.87	3321.99	390.83	0.001
II labor stage minute	35	12	34.7	8.3	35.5	14	0.351

**Table II.** Differences between patients regarding laceration grade and site.

Parameters	Laceration grade		Laceration site	
	$\chi^2$	p	$\chi^2$	p
Age	6.281	0.043	26.535	0.001
Parity	19.392	0.001	50.317	0.001
Episiotomy presence	0.630	0.730	243.658	0.001
Laceration site	19.920	0.001	/	/
Baby weight	14.058	0.001	3.479	0.324
Laceration grade	/	/	27.258	0.001
Labor stimulation	2.048	0.359	1.866	0.601
Classes	1.694	0.328	10.421	0.015
Epidural use	2.531	0.282	7.085	0.069
II labor stage duration	1.452	0.473	0.952	0.846
Fetal presentation	4.023	0.001	2.295	0.326

**Table III.** Investigated parameters in groups of women with and without episiotomy.

Parameters		With episiotomy		Without episiotomy		KW $\chi^2$	p
		Frequency (No)	Percent (%)	Frequency (No)	Percent (%)		
Laceration site	vagina	178	12.78	146	10.48	101.662	0.001
	perineum	63	4.52	544	39.05		
	labia	17	1.22	67	4.81		
	combined	68	4.88	310	22.25		
Laceration grade	I	315	22.61	1024	73.51	0.276	0.600
	II	5	0.36	24	1.72		
	III	6	0.43	19	1.36		
Stimulation	yes	884	63.46	259	18.59	0.584	0.445
	no	56	4.02	18	1.29		
Neonatal classes	yes	174	12.49	544	39.05	0.571	0.450
	no	152	10.91	523	37.45		
Epidural use	yes	204	14.64	643	46.16	0.561	0.454
	no	122	8.76	424	30.44		
Parity	1	224	16.08	199	14.29	208.769	0.001
	2	72	5.17	680	48.82		
	3	14	1.01	140	10.05		
	4	16	1.15	48	3.45		
Occipital presentation	anterior	640	45.94	610	43.79	1.732	0.138
	posterior	69	4.95	64	4.59		

**Table IV.** Correlations of the examined parameters.

Parameters		Age	Birth No	Episiot	Lacerat site	Baby weight	Lacerat grade	Stimul	Classes	Epidur
Age	ρ	1.000	0.153	-0.103	0.004	0.068	0.056	0.032	-0.021	-0.011
	p	.	<b>0.001</b>	<b>0.001</b>	0.873	0.011	0.035	0.228	0.423	0.678
Birth number	ρ	0.153	1.000	-0.387	0.088	0.196	-0.118	-0.014	0.029	0.027
	p	<b>0.001</b>	.	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	0.593	0.287	0.318
Episiotomy presence	ρ	-0.103	-0.387	1.000	-0.270	-0.109	-0.014	-0.020	-0.020	-0.020
	p	<b>0.001</b>	<b>0.000</b>	.	<b>0.000</b>	<b>0.000</b>	0.600	0.445	0.450	0.454
Laceration site	ρ	0.004	0.088	-0.270	1.000	0.026	0.120	-0.004	-0.028	-0.038
	p	0.873	<b>0.001</b>	<b>0.001</b>	.	0.338	<b>0.001</b>	0.877	0.064	0.158
Newborn weight	ρ	0.068	0.196	-0.109	0.026	1.000	-0.100	-0.026	0.020	-0.046
	p	<b>0.011</b>	<b>0.001</b>	<b>0.001</b>	0.338	.	<b>0.001</b>	0.336	0.464	0.089
Laceration grade	ρ	0.056	-0.118	-0.014	0.120	-0.100	1.000	-0.036	-0.026	0.007
	p	<b>0.035</b>	<b>0.001</b>	0.600	<b>0.001</b>	<b>0.001</b>	.	0.180	0.064	0.789
Labor stimulation	ρ	0.032	-0.014	-0.020	-0.004	-0.026	-0.036	1.000	-0.061	-0.020
	p	0.228	0.593	0.445	0.877	0.336	0.180	.	<b>0.022</b>	0.447
Neonatal classes	ρ	-0.021	0.029	-0.020	-0.028	0.020	-0.026	-0.060	1.000	0.013
	p	0.423	0.287	0.450	0.064	0.464	0.064	<b>0.022</b>	.	0.627
Epidural use	ρ	-0.011	0.027	-0.020	-0.038	-0.046	0.007	-0.020	0.013	1.000
	p	0.678	0.318	0.454	0.158	0.089	0.789	0.447	0.627	.
II stage duration	ρ	0.032	0.078	0.014	-0.020	-0.081	0.004	-0.014	0.032	-0.021
	p	0.569	<b>0.035</b>	0.593	0.450	<b>0.040</b>	0.873	0.593	0.228	0.423
Presenting part	ρ	0.032	-0.014	0.182	0.016	-0.026	0.158	0.004	0.007	0.046
	p	0.228	0.593	<b>0.001</b>	0.538	0.336	<b>0.001</b>	0.873	0.952	0.089

There were significantly more patients who did not use epidural analgesia ( $\chi^2=65.040$ ;  $p=0.000$ ). However, there were no significant differences between women with and without episiotomy concerning epidural use (Table III). Moreover, there were no significant differences in the laceration grade and site regarding the use of epidural (Table II).

There were no significant differences in the number of women who attended neonatal classes as a part of labor preparation ( $\chi^2=1.327$ ;  $p=0.249$ ). There were no significant differences between women with and without episiotomy regarding participation in neonatal classes (Table III). Furthermore, there were no significant differences in the laceration grade between these patients. However, women who were had prepared for delivery had the smallest number of combined lacerations (Table II).

Episiotomy was significantly and negatively correlated with patient age, newborn weight, parity and laceration site. Therefore, it seems safe to conclude that fewer lacerations occur if episiotomy is performed. Moreover, laceration site was significantly and positively correlated with parity, meaning that multiparous women usually had a combination of lacerations. Additionally, laceration site was positively and significantly correlated with laceration grade. Newborn birth weight was significantly positively correlated with maternal age and parity, and negatively with episiotomy and laceration grade. This

indicated that older women of higher parity delivered children with higher birth weight. Children with higher body mass caused higher grade lacerations. Additionally, maternal age was related to parity, newborn weight, episiotomy and laceration grade. Older women had higher grade lacerations. Parity was significantly related to all of the investigated parameters except for labor stimulation, attending neonatal classes and use of epidural analgesia. Duration of the second stage of labor was significantly positively correlated with parity and negatively with newborn birth weight. Consequently, expulsion was faster if a child had lower birth weight and if a mother was not a nullipara. Labor stimulation and antenatal classes were significantly negatively correlated with each other, i.e. women who were prepared for labor did not have to be stimulated during delivery more often than their unprepared peers. The use of epidural analgesia was not significantly correlated with other examined parameters. Laceration grade was correlated with laceration site, newborn birth weight and parity (Table IV).

The evaluated parameters were good discriminating factors between laceration sites. We obtained three statistically significant functions (function 1: eigenvalue=0.220; % of variance=84.4; canonical correlation=0.424; Wilks  $\lambda=0.788$ ;  $\chi^2=333.265$ ;  $p=0.001$ ; function 2: eigenvalue=0.025; % of variance=9.7; canonical correlation=0.157; Wilks  $\lambda=0.961$ ;  $\chi^2=56.172$ ;  $p=0.001$  and function 3: eigenvalue=0.016; % of variance=6.0; canonical

**Table V.** Correlation coefficients between discriminating variables and standardized canonical discriminant function and group centroids of discriminant function.

Parameters		Function		
		1	2	3
Examined parameters	episiotomy presence	0.982(*)	-0.021	0.102
	mothers age	-0.070	0.646(*)	0.539
	parity	-0.365	0.494(*)	0.070
	neonatal classes	0.052	0.381(*)	-0.339
	epidural use	-0.041	0.357(*)	-0.215
	labor stimulation	-0.039	0.187(*)	0.031
	fetal presentation	-0.021	0.154(*)	0.073
	neonatal birth weight	-0.108	0.137(*)	0.109
	II labor stage duration	-0.103	0.090(*)	0.256
	laceration grade	-0.101	-0.278	0.759(*)
Functions at Group Centroids	vagina	0.838	0.022	-0.039
	perineum	-0.336	0.014	-0.108
	labia	-0.050	-0.612	0.106
	combination	-0.160	0.094	0.186

LEGEND: Function 1 – significant; Function 2 – significant; Function 3 – significant  
(\*) – Largest absolute correlation between each variable and any discriminant function

correlation=0.124; Wilks  $\lambda$ =0.985;  $\chi^2$ =21.510;  $p$ =0.001). From the largest group centroids for significant functions, it can be concluded that episiotomy can discriminate vaginal lacerations from other laceration sites, laceration grade discriminates lacerations of labia, while all other evaluated parameters discriminate combined lacerations from single-site lacerations (Table V).

Statistically significant logistic regression equation was obtained using Enter method of multiple linear regression when all parameters were assessed together for prediction of laceration grade ( $R$ =0.192;  $\text{adj}R^2$ =0.033;  $F$ =10.669;  $p$ =0.000). Based on that, Stepwise method was applied and according to the four significant models that were constructed, laceration site was the most and neonatal birth weight the least important for laceration grade:

**LACERATION GRADE: 0.980 + 0.032 x LACERATION SITE**

**LACERATION GRADE: 1.013 + 0.034 x LACERATION SITE – 0.040 x PARITY**

**LACERATION GRADE: 0.879 + 0.034 x LACERATION SITE – 0.045 x PARITY + 0.005 x AGE**

**LACERATION GRADE: 1.045 + 0.034 x LACERATION SITE – 0.045 x PARITY + 0.005 x AGE – 0.005 x NEONATAL BIRTH WEIGHT**

## Discussion

Physiological changes of mechanical and hormonal nature in pregnancy contribute to reshaping of the muscular-aponeurotic structures of the pelvic floor. In this way, they weaken its normal resistance and functioning, thus causing greater predisposition to vaginal birth-related trauma [3].

Clear risk factors for birth-related perineum trauma include maternal age, ethnicity, prolonged second stage of labor,

nulliparity, fetal macrosomia and interventions during labor (oxytocin, maternal position and instrumental delivery) [4-7].

When episiotomy was first introduced, it was thought possible to prevent or limit vast perineum lacerations and reduce stress in the muscular-aponeurotic structures of the pelvic floor, thus preventing genital prolapse in the future and incontinence problems in the post-partum period [1, 2].

Since the introduction of episiotomy, precise indications and methods of performance have been repeatedly discussed. Furthermore, opinions about this technique have undergone considerable change over the years.

Episiotomy was widespread in the early 80s, although no data about its role in the prevention of vast perineum lacerations was available at that time. Later it was found that episiotomy had no impact on perineum lacerations but had very strong protective effect on other lacerations. Therefore, separating different birth canal lacerations is critical in identifying risk factors and potential preventive strategies [8]. Moreover, restricting lateral episiotomy use may result in higher obstetric anal sphincter injuries rates [9]. Research demonstrated a significant correlation between increasing medio-lateral episiotomy rates and decreasing obstetric anal sphincter injury [5]. A restrictive use of episiotomy can increase rates of urinary morbidity, in particular stress [10]. Moreover, medio-lateral episiotomy seems to prevent central defects on the anterior vaginal wall [11]. Although women with episiotomy complain about perineal pain in the first postpartum week more frequently, research proved that three years after the birth there was no statistical difference in incontinence, perineum pain, and dyspareunia between patients who underwent routine episiotomy as compared to selective episiotomy [12, 13].

Restrictive application of episiotomy has started since the 90s when some studies showed that episiotomy, if used extensively, could provoke grade III and IV perineum lacerations

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and severe complications in the post-partum period [3, 14]. Episiotomy could increase bleeding and dyspareunia, causing slower cicatrization even more than in the case of spontaneous lacerations [15]. The literature data support the restrictive use of episiotomy, since almost a thousand episiotomies should be performed in order to prevent one obstetric anal sphincter rupture among primiparous women [16]. Moreover, some data show that episiotomy during one vaginal delivery increases the risk of spontaneous obstetric laceration in the subsequent deliveries [17]. Episiotomy does not prevent lesions of the pelvic floor and, consequently, urinary incontinence. Furthermore, it does not improve neonatal outcomes [18]. Therefore, at the moment it is believed that episiotomy should be performed in primigravidas restrictively and only when essential [19, 20].

It is recommended to use medio-lateral episiotomy instead of the median one to reduce the risk of severe perineum lacerations [19]. Meta-analyses have proven that medio-lateral episiotomy is not correlated with severe injuries of the perineum [21]. The median technique may cause a greater risk by extending posteriorly, thus causing severe lacerations of the anus [22-24]. In our study all women had medio-lateral cuts as that is the protocol in both study centers.

In the examined population of both, Belgrade and Mesina, episiotomy is usually performed in older primiparas who have children with higher birth weight. The majority of the examined women with lacerations were secundiparas and did not have episiotomy. The most frequent site of lacerations was the perineum, but they were of low grade. Episiotomy reduced the number of labial lacerations, while women without episiotomy had significantly more perineum lacerations. Episiotomy was significantly and negatively correlated with all of the examined maternal and fetal characteristics, which implies that fewer lacerations are present if episiotomy is performed. Episiotomy can discriminate vaginal lacerations from other sites, while all other evaluated parameters discriminate combined lacerations from single-site lacerations. Episiotomy proved to have no impact only on laceration grade. However, the obtained logistic regression equations demonstrated that laceration site is the most important risk factor for higher laceration grade.

Some authors have shown that labor induction/augmentation, epidural anesthesia, occipito-posterior presentation and early pushing can all be risk factors for perineal lacerations and sphincter muscle injuries [25]. Some systematic reviews showed that grade III and IV lacerations were more frequent in patients with significantly longer second stage of labor [21]. The majority of our patients had labor stimulation and did not use epidural analgesia. Still, these parameters did not have significant influence on the presence of lacerations.

Additionally, the duration of the second stage was also not correlated with different laceration sites, possibly because we tried to keep the duration of second labor stage within the referral range suggested by the protocols followed in our clinics. On the other hand, all women were instructed by the midwives when to start pushing. We proved that occipito-posterior presentation causes lacerations of a higher grade, and episiotomy should always be performed in these cases.

Multivariable logistic regression modeling for anal sphincter laceration performed in some studies generated the following significant factors: episiotomy, vertex malpresentation (primarily

occiput posterior), shoulder dystocia, and infant birth weight of 3500 grams or greater [23]. We obtained models for predicting laceration grade, which is the innovation of our research. We showed that evaluated maternal and fetal characteristics such as laceration site, lower parity, older women and heavier children can all cause higher laceration grade.

The decision to perform episiotomy is found to be linked to the actual clinical situation. Thus, there is still a great need for continuous education regarding hospital delivery. This approach enables us to have fewer birth-related complications [26]. We also proved that maternal and fetal characteristics should be always evaluated as independent risk factors for lacerations and that they must be considered before performing episiotomy.

The limitation of our study is the fact that we assessed only early complications of vaginal delivery. We did not study the long-term complications of episiotomy, such as pelvic organ prolapse and incontinence. However, we intend to deal with that issue in our further research as in present study we wanted only to focus on episiotomy and perineum tears. The difference in the number of patients in Belgrade and Messina group could also be considered as a drawback of the study. However, we specifically designed this investigation in two European centers in order to have a bigger sample and we assessed the population from both clinics as one group. As both clinics had the same protocol for performing episiotomy, we considered all the patients eligible for the study.

## Conclusions

Medio-lateral episiotomy can significantly reduce the number of genital lacerations although it has no influence on their severity. It can be concluded that episiotomy can protect the vaginoperineal site if used for older primiparas who have children with higher birth weight in occipito-posterior presentation, and so that it should be performed regularly in such cases. Women should be encouraged to attend antenatal classes, as being prepared for labor can help reduce the grade of potential birth-related genital lacerations. Therefore, we recommend an analysis of all maternal and fetal factors related to the decision for episiotomy in order to prevent widespread genital lacerations.

### Authors' contribution:

1. Antonio Simone Laganà – concept, acquisition of data, revised article critically.
2. Milan Terzic – assumptions, study design, revised article critically, corresponding author.
3. Jelena Dotlic – concept, analysis and interpretation of data, article draft.
4. Emanuele Sturlese – acquisition of data, literature review, article draft.
5. Vittorio Palmara – acquisition of data, literature review, article draft.
6. Giovanni Retto – acquisition of data, literature review, article draft.
7. Dusica Kocijancic – acquisition of data, literature review, article draft.

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## References

- Eason E, Labrecque M, Wells G, Feldman P. Preventing perineal trauma during childbirth: a systematic review. *Obstet Gynecol.* 2000, 95,464–471.
- Pietras J, Taiwo BF. Episiotomy in modern obstetrics—necessity versus malpractice. *Adv Clin Exp Med.* 2012, 21, 545–550.
- Wijma J, Weis Potters AE, de Wolf BT, [et al.]. Anatomical and functional changes in the lower urinary tract during pregnancy. *BJOG.* 2001, 108, 726–732.
- Da Silva FM, de Oliveira SM, Bick D, [et al.]. Risk factors for birth-related perineal trauma: a cross-sectional study in a birth centre. *J Clin Nurs.* 2012, 21, 2209–2218.
- Twidale E, Cornell K, Litzow N, Hotchin A. Obstetric anal sphincter injury risk factors and the role of the mediolateral episiotomy. *Aust N Z J Obstet Gynaecol.* 2013, 53 (1), 17–20. doi: 10.1111/j.1479-828X.2012.01483.x.
- Landy HJ, Laughon SK, Bailit JL, [et al.]. Characteristics associated with severe perineal and cervical lacerations during vaginal delivery. *Obstet Gynecol.* 2011, 117, 627–635.
- Hirayama F, Koyanagi A, Mori R, [et al.]. Prevalence and risk factors for third- and fourth-degree perineal lacerations during vaginal delivery: a multi-country study. *BJOG.* 2012, 119, 340–347.
- Mikolajczyk RT, Zhang J, Troendle J, Chan L. Risk factors for birth canal lacerations in primiparous women. *Am J Perinatol.* 2008, 25, 259–264.
- Räsänen S, Vehviläinen-Julkunen K, Gissler M, Heinonen S. Hospital-based lateral episiotomy and obstetric anal sphincter injury rates: a retrospective population-based register study. *Am J Obstet Gynecol.* 2012, 206, 347.e1-6.
- Macleod M, Goyder K, Howarth L, [et al.]. Morbidity experienced by women before and after operative vaginal delivery: prospective cohort study nested within a two-centre randomised controlled trial of restrictive versus routine use of episiotomy. *BJOG.* 2013, 120, 1020–1026.
- Cam C, Asoglu MR, Selcuk S, [et al.]. Does mediolateral episiotomy decrease central defects of the anterior vaginal wall? *Arch Gynecol Obstet.* 2012, 285, 411–415.
- Karaçam Z, Ekmen H, Çalışır H, Seker S. Prevalence of episiotomy in primiparas, related conditions, and effects of episiotomy on suture materials used, perineal pain, wound healing 3 weeks postpartum, in Turkey: A prospective follow-up study. *Iran J Nurs Midwifery Res.* 2013, 18, 237–245.
- Fritel X, Schaal JP, Fauconnier A, [et al.]. Pelvic floor disorders four years after first delivery: a comparative study of restrictive versus systematic episiotomy. *Gynecol Obstet Fertil.* 2008, 36, 991–997.
- Andrews V, Thakar R, Sultan AH, Jones PW. Evaluation of postpartum perineal pain and dyspareunia—a prospective study. *Eur J Obstet Gynecol Reprod Biol.* 2008, 137, 152–156.
- Langer B, Minetti A. Immediate and long term complications of episiotomy. *J Gynecol Obstet Biol Reprod.* 2006, 35, 1S59–1S67.
- Räsänen SH, Vehviläinen-Julkunen K, Gissler M, Heinonen S. Lateral episiotomy protects primiparous but not multiparous women from obstetric anal sphincter rupture. *Acta Obstet Gynecol Scand.* 2009, 88, 1365–1372.
- Alperin M, Krohn MA, Parviainen K. Episiotomy and increase in the risk of obstetric laceration in a subsequent vaginal delivery. *Obstet Gynecol.* 2008, 111, 1274–1278.
- Shahraki AD, Aram S, Pourkabarir S, [et al.]. A comparison between early maternal and neonatal complications of restrictive episiotomy and routine episiotomy in primiparous vaginal delivery. *J Res Med Sci.* 2011, 16, 1583–1589.
- American College of Obstetricians and Gynecologists. Episiotomy. Washington (DC): American College of Obstetricians and Gynecologists (ACOG); 2006 Apr. 6 p. (ACOG practice bulletin; no. 71).
- Sulaiman AS, Ahmad S, Ismail NA, [et al.]. A randomized control trial evaluating the prevalence of obstetric anal sphincter injuries in primigravida in routine versus selective mediolateral episiotomy. *Saudi Med J.* 2013, 34, 819–823.
- Pergialiotis V, Vlachos D, Protopapas A, [et al.]. Risk factors for severe perineal lacerations during childbirth. *Int J Gynaecol Obstet.* 2014, 125, 6–14.
- Eogan M, Daly L, O'Connell PR, O'Herlihy C. Does the angle of episiotomy affect the incidence of anal sphincter injury? *BJOG.* 2006, 113, 190–194.
- Jovanovic N, Kocijancic D, Terzic M. Current approach to episiotomy: Inevitable or unnecessary? *Gen Eur J Med.* 2011, 6, 685–690.
- Carroll G, Mignini L. Episiotomy for vaginal birth. *Cochrane Database System Rev.* 2009; CD000081.
- Dudding TC, Vaizey CJ, Kamm MA. Obstetric anal sphincter injury: incidence, risk factors, and management. *Ann Surg.* 2008, 247, 224–237.
- Lowder JL, Burrows LJ, Krohn MA, Weber AM. Risk factors for primary and subsequent anal sphincter lacerations: a comparison of cohorts by parity and prior mode of delivery. *Am J Obstet Gynecol.* 2007, 196, 344.e1-5.

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