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

Antonio Simone Laganà¹, Milan Terzic²,³, Jelena Dotlic²,³, Emanuele Sturlese¹, Vittorio Palmara¹, Giovanni Retto¹, Dusica Kocijancic²

¹ Department of Pediatric, Gynecological, Microbiological and Biomedical Sciences, University of Messina, Messina, Italy
² Clinic of Obstetrics and Gynecology, Clinical Center of Serbia, Belgrade, Serbia
³ School of Medicine, University of Belgrade, Belgrade, Serbia

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 widespread genital lacerations.

Key words: episiotomy / genital lacerations / vaginal delivery / laceration risk factors /
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, χ² 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 gravids 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.
Maternal age ranged from 16 to 43. Women with episiotomy were significantly younger than those who did not have episiotomy ($KW_{x}^{2} = 3.411; p=0.001$) (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 ($KW_{x}^{2} = 4.117; p=0.001$). 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 ($KW_{x}^{2} = 0.237; p=0.351$) (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 (5U 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).
### Table I. Descriptive data of patient population.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>All women</th>
<th>Episiotomy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Maternal age</td>
<td>29.38</td>
<td>5.17</td>
</tr>
<tr>
<td>Baby weight gram</td>
<td>3389.82</td>
<td>416.77</td>
</tr>
<tr>
<td>II labor stage minute</td>
<td>35</td>
<td>12</td>
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</table>

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

<table>
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<th>Laceration site</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \chi^2 )</td>
<td>p</td>
</tr>
<tr>
<td>Age</td>
<td>6.281</td>
<td>0.043</td>
</tr>
<tr>
<td>Parity</td>
<td>19.392</td>
<td>0.001</td>
</tr>
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<td>Episiotomy presence</td>
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<td>0.730</td>
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<tr>
<td>Laceration site</td>
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<tr>
<td>Baby weight gram</td>
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<td>0.001</td>
</tr>
<tr>
<td>Laceration grade</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Labor stimulation</td>
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<tr>
<td>Classes</td>
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<tr>
<td>Epidural use</td>
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<td>II labor stage duration</td>
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<td>Fetal presentation</td>
<td>4.023</td>
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### Table III. Investigated parameters in groups of women with and without episiotomy.

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<th>Without episiotomy</th>
<th>KW ( \chi^2 )</th>
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<td>Percent (%)</td>
<td>Frequency (No)</td>
<td>Percent (%)</td>
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<td></td>
<td></td>
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<tr>
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<td>178</td>
<td>12.78</td>
<td>146</td>
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<tr>
<td>perineum</td>
<td>63</td>
<td>4.52</td>
<td>544</td>
<td>39.05</td>
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<tr>
<td>labia</td>
<td>17</td>
<td>1.22</td>
<td>67</td>
<td>4.81</td>
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<tr>
<td>combined</td>
<td>68</td>
<td>4.88</td>
<td>310</td>
<td>22.25</td>
</tr>
<tr>
<td>Laceration grade</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>315</td>
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<td>73.51</td>
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<tr>
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<td>544</td>
<td>39.05</td>
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<td>610</td>
<td>43.79</td>
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<tr>
<td>posterior</td>
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<td>4.95</td>
<td>64</td>
<td>4.59</td>
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Table IV. Correlations of the examined parameters.

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

There were significantly more patients who did not use epidural analgesia (χ²=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 (χ²=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 λ=0.788; χ²=333.265; p=0.001; function 2: eigenvalue=0.025; % of variance=9.7; canonical correlation=0.157; Wilks λ=0.961; χ²=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.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Function 1</th>
<th>Function 2</th>
<th>Function 3</th>
</tr>
</thead>
<tbody>
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<td>episiotomy presence</td>
<td>0.982(*)</td>
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<td>0.102</td>
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<td>mothers age</td>
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<td>0.646(*)</td>
<td>0.539</td>
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<td>parity</td>
<td>-0.365</td>
<td>0.494(*)</td>
<td>0.070</td>
</tr>
<tr>
<td>neonatal classes</td>
<td>0.052</td>
<td>0.381(*)</td>
<td>-0.339</td>
</tr>
<tr>
<td>epidural use</td>
<td>-0.041</td>
<td>0.357(*)</td>
<td>-0.215</td>
</tr>
<tr>
<td>labor stimulation</td>
<td>-0.039</td>
<td>0.187(*)</td>
<td>0.031</td>
</tr>
<tr>
<td>fetal presentation</td>
<td>-0.021</td>
<td>0.154(*)</td>
<td>0.073</td>
</tr>
<tr>
<td>neonatal birth weight</td>
<td>-0.108</td>
<td>0.137(*)</td>
<td>0.109</td>
</tr>
<tr>
<td>II labor stage duration</td>
<td>-0.103</td>
<td>0.090(*)</td>
<td>0.256</td>
</tr>
<tr>
<td>laceration grade</td>
<td>-0.101</td>
<td>-0.278</td>
<td>0.759(*)</td>
</tr>
</tbody>
</table>

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 λ=0.985; χ²=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; adjR²=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.
and severe complications in the post-partum period [3, 14]. Epi
tosotomy could increase bleeding and dyspareunia, causing
closer cicatrisation 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/intravenous, 
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 
occuput 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 
prolapase 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 vagina-
perineal site if used for older primiparas who have children with 
higher birth weight in occipito-posterior presentation, and so that 
is 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 Lagana – concept, acquisition of data, revised article critically.
2. Milan Terzić – assumptions, study design, revised article critically, 
   corresponding author.
3. Jelena Dotlić – 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 Kocijančič – acquisition of data, literature review, article draft.

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References


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