Relation between Perineal body Length and Lacerations at delivery

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Abstract: Background To define normal perineal body length during labor and determine if a shortened perineal body is associated with perineal lacerations or operative vaginal delivery. Objectives: evaluate the effect of perineal stretching on perineal damage during vaginal delivery. Materials and Methods: Delivery will be carried out in lithotomy position and perineal measurements (to the nearest 0.5 cm) will be obtained on 3 different occasions for each parturient: the beginning of the active phase of labor (effacement of 80-100% and 3-4cm dilatation), during the second stage, with the vertex at the crowning position (before episiotomy will be performed, if at all), and 24 hours after delivery. Landmarks used for perineal measurement included perineal body length (the distance between the posterior fourchette and center of the anal orifice), and genital hiatus length (the distance between the middle of external urethral meatus and the fourchette), Perineal measurements will be obtained using a flexible measuring tape disinfected by betadine against the perineal tissue during measurement. For each patient, we will make a record for the following characteristics: maternal age, height, weight, gestational age, duration of first and second stage of labor, use of oxytocin, use of forceps or vaccum, epidural use, episiotomy use, and blood loss at delivery. Birth outcome data will be obtained and will include the infant's sex, weight, head circumference, Apgar score and mode of delivery, occiput position and use of instrumentation. Perineal outcome included the use of episiotomy, spontaneous extension, presence and degree of spontaneous lacerations, and anal damage. This will be assessed by an attending physician. Relation between perineal body length at second stage of labour, third stage and laceration against HC of fetus, dyspareunia and incontinence at 2, 4, 6 weeks after delivery. Results: According to the results the patients were categorized into two groups:- Group I: patients with perineal body length ≤ 3.5cm (N=16). Group II: patients with perineal body length >3.5cm (N=84). Another classification is done according to the perineal stretching into: Group of perineal stretching<150%:(N=94). Group of perineal stretching ≥150%: (N=6). According to the follow up of patients three months after delivery they were classified into:- Episiotomy group (N=52): including patients to whom episiotomy was done. Non Episiotomy group (N=48): including patients with intact perineum, first, and second degree perineal tears. The incidence of perineal tear was statistically significant higher in the group of perineal stretching ≥150% than that in the group of perineal stretching <150%. According to the follow up of patients three months after delivery, no difference was found in the incidence of stress urinary incontinence, dyspareunia, and perineal pain in then on-episiotomy my group and the episiotomy my group. The incidence of anal incontinence was 0%. No significant correlation was found between the perineal body length and body mass index, maternal weight, maternal height, duration of the first stage of labor, nor the duration of the second stage of labor. It was found that there was a significant positive correlation between perineal stretching and degree of perineal tear. It was found that there was a significant positive correlation between the length of episiotomy and the duration of 2nd stage of labor. Conclusion: A short perineum in a given patient should alert the obstetrician to the potential for complications related to perineal trauma from delivery.


Keywords: perineal tear, perineal body length, laceration at delivery, Post partum pain, dysparunia, urinary incontinence, fecal incontinence

1. Introduction

In the last 20 years, reliable scientific observations have been made on several aspects of birth care, Evidence from randomized clinical trials showed that avoiding perineotomy protect perineal integrity (Walfisch et al., 2005).

Episiotomy and posterior perineal lacerations are frequent obstetric events that may be associated with significant and debilitating postoperative morbidity (De Parades et al., 2004).

Although episiotomy use has decreased over time, its rates remain higher than evidence-based recommendations for optimal patient care. Nevertheless, we are not aware of any published data containing evidence-based recommendations for an appropriate episiotomy rate (Carroli and Belizan, 2000).

There is an increased risk of significant lacerations and operative vaginal delivery in patients with a shortened perineal body (Deering et al., 2004).
Episiotomy was performed at higher rates in cases of less tissue stretching. A possible explanation might be that once episiotomy is performed, tissue stretching is stopped. (Walfisch et al., 2005).

Spontaneous posterior perineal lacerations are common during vaginal delivery particularly in nulliparous women causing either occult or recognized anal sphincter disruption with subsequent fecal incontinence in 50% of cases (Pinta et al., 2004).

Perineal trauma also contributes to the development of pelvic organ prolapse and urodynamic stress incontinence as a result of injury to the pelvic floor. Episiotomy has been performed to protect against these complications (Fleming et al., 2003).

Episiotomy also decreases perineal muscle strength and performance during the postpartum period more than does spontaneous posterior perineal laceration because of greater tissue disruption (Sartore et al., 2004).

Although several maternal, fetal, and operator variables have been blamed for causing posterior perineal lacerations, very little is known about the relative interaction or confounding effect of the length of the perineum as a potential risk factor (Christianson et al., 2003).

The optimum length of episiotomy or its relationship to perineal length is also rarely, if ever, described in obstetric or operative texts (Cleary-Goldman and Robinson, 2003).

Moreover, the length of the genital hiatus has not been studied in relation to posterior perineal injury although this measurement is inversely associated with the length of the perineum (Rizk and Thomas, 2000).

The incidence of episiotomy and spontaneous posterior perineal tears was increased in women with a perineum shorter than 4 cm (Rizk and Thomas, 2000).

It is well established that third- and fourth-degree lacerations sustained during vaginal delivery place patients at risk of incontinence of stool and flatus. Previous studies that have evaluated risk factors for these types of injuries have focused on fetal weight, instrumental delivery and use of episiotomy as etiologic factors while not taking into account the individual patient's anatomy (Deering et al., 2004).

Shredding lacerations of the perineum are uncommon and occur usually with uncontrolled pushing or operative delivery when the perineum has not had time to stretch (Eason and Feldman, 2000).

Aim of the work

To define normal perineal body length during labor and determine if a shortened perineal body is associated with perineal lacerations or operative vaginal delivery and to evaluate the effect of perineal stretching on perineal damage during vaginal delivery.

2. Patients and methods

This study will be conducted in tahta general hospital. The study will include 100 pregnant patients admitted for labor with the following.

Inclusion criteria:
- Age: 20-35 years.
- Single living fetus.
- Gestational age: 37-42 weeks.
- Vertex presentation.

Exclusion criteria:
- Malpresentation.
- Multiple gestation.
- Gestational age < 36 weeks.
- Scheduled cesarean delivery.
- Vulvar varicosities.
- Diseased perineum.
- Anal or urinary incontinence that pre-existing vaginal delivery.

Study Procedures:

After taking an informed consent, history taking and general examination, all of the patients be carried out in lithotomy position and perineal measurements (to the nearest 0.5 cm) will be obtained on 3 different occasions for each parturient: the beginning of the active phase of labor (effacement of 80-100% and 3-4cm dilatation), during the second stage, with the vertex at the crowning position (before episiotomy will be performed, if at all), and 24 hours after delivery. Landmarks used for perineal measurement included perineal body length (the distance between the posterior fourchette and center of the anal orifice), and genital hiatus length (the distance between the middle of external urethral meatus and the fourchette). Perineal measurements will be obtained using a flexible measuring tape disinfected by betadine against the perineal tissue during measurement.

3. Results:

All the results are shown in Tables 1-7.

<table>
<thead>
<tr>
<th>Demographic Data</th>
<th>Group I (PB≤3.5) [N=16]</th>
<th>Group II (PB&gt;3.5) [N=84]</th>
<th>t/x2*</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>28.00±3.25</td>
<td>27.43±4.75</td>
<td>0.324</td>
<td>0.747</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>161.75±5.04</td>
<td>165.05±6.19</td>
<td>-1.417</td>
<td>0.163</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>72.00±5.10</td>
<td>74.98±6.71</td>
<td>-1.187</td>
<td>0.241</td>
</tr>
<tr>
<td>BMI [wt/(ht)2]</td>
<td>27.38±3.11</td>
<td>27.19±2.33</td>
<td>0.194</td>
<td>0.847</td>
</tr>
<tr>
<td>Parity</td>
<td>0.88±0.99</td>
<td>1.14±1.46</td>
<td>-0.496</td>
<td>0.622</td>
</tr>
<tr>
<td>Gestational Age (wks)</td>
<td>39.38±1.06</td>
<td>38.57±1.09</td>
<td>1.926</td>
<td>0.048</td>
</tr>
</tbody>
</table>

This table shows statistically significant difference between groups according gestational age (wks).
Table (2): Comparison between group I and group II according genital hiatus.

<table>
<thead>
<tr>
<th>Genital hiatus</th>
<th>Group I (PB≤3.5) [N=16]</th>
<th>Group II (PB&gt;3.5) [N=84]</th>
<th>t/x2*</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Stage (cm)</td>
<td>3.75±0.27</td>
<td>3.99±0.49</td>
<td>-1.336</td>
<td>0.188</td>
</tr>
<tr>
<td>2nd stage at crowning (cm)</td>
<td>8.50±0.60</td>
<td>8.76±0.58</td>
<td>-1.172</td>
<td>0.247</td>
</tr>
<tr>
<td>24 hour after delivery (cm)</td>
<td>3.88±0.23</td>
<td>4.07±0.45</td>
<td>-1.199</td>
<td>0.237</td>
</tr>
</tbody>
</table>

This table shows no statistically significant difference between groups according genital hiatus.

Table (3): Comparison between group I and group II according perineal length.

<table>
<thead>
<tr>
<th>Perineal length</th>
<th>Group I (PB≤3.5) [N=16]</th>
<th>Group II (PB&gt;3.5) [N=84]</th>
<th>t/x2*</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Stage</td>
<td>3.13±0.23</td>
<td>4.43±0.45</td>
<td>-7.955</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>2nd Stage</td>
<td>7.38±1.03</td>
<td>9.92±1.23</td>
<td>-5.463</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>24 hr After delivery</td>
<td>3.25±0.27</td>
<td>4.48±0.47</td>
<td>-7.154</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

This table shows highly statistically significant difference between groups according perineal length.

Table (4): Comparison between group I and group II according duration.

<table>
<thead>
<tr>
<th>Duration</th>
<th>Group I (PB≤3.5) [N=16]</th>
<th>Group II (PB&gt;3.5) [N=84]</th>
<th>t/x2*</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st stage (hr)</td>
<td>8.56±2.92</td>
<td>8.37±2.55</td>
<td>0.193</td>
<td>0.848</td>
</tr>
<tr>
<td>2nd stage (min)</td>
<td>45.13±13.40</td>
<td>41.05±12.29</td>
<td>0.849</td>
<td>0.400</td>
</tr>
</tbody>
</table>

This table shows no statistically significant difference between groups according duration.

Table (5): Comparison between group I and group II according perineal tear.

<table>
<thead>
<tr>
<th>Perineal tear</th>
<th>Group I (PB≤3.5) [N=16]</th>
<th>Group II (PB&gt;3.5) [N=84]</th>
<th>Chi-square test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>4 (25%)</td>
<td>16 (19%)</td>
<td>0.149</td>
<td>0.700</td>
</tr>
<tr>
<td>Degree</td>
<td>0 (0%)</td>
<td>14 (16.7%)</td>
<td>7.093</td>
<td>0.029</td>
</tr>
</tbody>
</table>

This table shows statistically significant difference between groups according degree of perineal tear.

Table (6): Comparison between group I and group II according stress incontinence.

<table>
<thead>
<tr>
<th>Stress Incontinence</th>
<th>Group I (PB≤3.5) [N=16]</th>
<th>Group II (PB&gt;3.5) [N=84]</th>
<th>Chi-square test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 wks post partum</td>
<td>2 (12.5%)</td>
<td>0 (0%)</td>
<td>5.357</td>
<td>0.021</td>
</tr>
<tr>
<td>4 wks post partum</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>6 wks post partum</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0.000</td>
<td>1.000</td>
</tr>
</tbody>
</table>

This table shows statistically significant difference between groups according stress incontinence 2wks post partum.

Table (7): Correlation between perineal length and other parameters, using Pearson correlation coefficient.

<table>
<thead>
<tr>
<th>Perineal length</th>
<th>r</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>-0.216</td>
<td>0.132</td>
</tr>
<tr>
<td>BMI [wt/(ht)2]</td>
<td>-0.087</td>
<td>0.547</td>
</tr>
<tr>
<td>Gestational Age (wks)</td>
<td>-0.212</td>
<td>0.139</td>
</tr>
<tr>
<td>Genital hiatus (1st)</td>
<td>0.257</td>
<td>0.072</td>
</tr>
<tr>
<td>Genital hiatus (2nd)</td>
<td>0.245</td>
<td>0.086</td>
</tr>
<tr>
<td>Genital hiatus (24 hr)</td>
<td>0.222</td>
<td>0.120</td>
</tr>
<tr>
<td>Perineal stretching</td>
<td>0.658</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Duration of 1st stage (hr)</td>
<td>-0.070</td>
<td>0.629</td>
</tr>
<tr>
<td>Duration of 2nd stage (min)</td>
<td>-0.197</td>
<td>0.170</td>
</tr>
<tr>
<td>Blood Loss at delivery By HB percent change (mg)</td>
<td>0.045</td>
<td>0.756</td>
</tr>
<tr>
<td>Perineal tear Degree</td>
<td>-0.094</td>
<td>0.517</td>
</tr>
</tbody>
</table>

Positive correlation and significant between perineal length and perineal stretching.
4. Discussion

This interesting study quantifies what obstetricians have long known, that is that the length of the perineum in a pregnant woman is an important determinant of whether or not an episiotomy will be needed, or if one is done, whether or not it will extend (Rizk and Thomas, 2005).

It should be possible to plan the length of episiotomy or predict the occurred necof long spontaneous posterior perineal lacerations based on perineal measurements and in turn minimize the likelihood of anal sphincter injury with its inherent morbidity (Nager and Helliwell, 2006).

Anthropometric studies of the perineum may provide additional information about the anal to my of the pelvic floor, and the data obtained might be of value in predicting damage to the perineum during delivery, particularly in primigravidae (Rizk and Thomas, 2005).

The functional importance of the length of the perineum has been largely neglected by clinicians, despite the fact that its important role in the diagnosis and classification of pelvic organ prolapse as recently been appreciated. A short perineal body (<3cm) was identified as being associated with weakness of the anatomical support of the pelvic viscera in their report, but without further discussion of the significance of the finding (Rizk and Thomas, 2005).

A short perineum and anterior displacement of the anus were associated with traumatic vaginal delivery in primigravidae, and gave evidence to support the judicious use of episiotomy in this group of women. Such information should aid those physicians interested in improving the clinical outcome of perineal injury in labor. Now that a simple technique is available to as sessperinealelleng than danal position index in the obstetric population, it should be possible to collect further data about such measurements in non-pregnant women with and without pelvic organ prolapse (Rizk and Thomas, 2005).

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Group I: patients with perineal body length ≤ 3.5 cm (N=16).

Group II: patients with perineal body length > 3.5 cm (N=84).

Another classification is done according to the perineal stretching (calculated by change in perineal body length in percent of primary perineal length) into:-

Group of perineal stretching < 150%: (N=94).

Group of perineal stretching ≥ 150%: (N=6).

According to the follow up of patients 6 weeks after delivery for the development of urinary and/or anal incontinence, dyspareunia and perineal pain, they were classified into:-

Episiotomy group (N=52): including patients to whom episiotomy was done.

Non Episiotomy group (N=48): including patients with intact perineum, first, and second degree perineal tears.

The patients were of average age (27.52 ± 4.52 years), weight (74.50 ± 6.53 kg), height (164.52 ± 6.1 meters), and BMI (27.22 ± 2.44 kg/m²). There were 50 PG (50 %), and 50 MG (50 %), the meanest atonalage was (38.7 ± 1.11 weeks).

The meanperineal body length was (4.22 ± 0.64 cm), the meange nitalhi at us length was (3.95 ± 0.47 cm). Perinealtears occurred in 20% inpatients, all of them were of first and second degree. Episiotomy done in (52%) in the study group and all were of mediolateral type. No instruments used.

All the infants delivered in occipitoanterior position, of average birth weight (3.30 ± 0.409 kg), head circumference (34.13 ± 1.26 cm), Apgar score (7.42 ± 0.67).

These results were similar to the results of the study done by Deering et al. (2004), from Bethesda who studied perineal body length and lacerations at delivery. The perineal body length of 133 women was measured from the four chette to the midanus. 56.4% of the study population were PG, and 43.6% of them
Significant difference in the incidence of perineal laceration between nulliparous and multiparous women was found in the study of Deering et al. (2004), who found no significant difference in the mean perineal body length (25.78 ± 4.07 years versus 25.8 ± 4.07 years respectively), weight (79.83 ± 10.55 kg versus 79.77 ± 11.02 kg respectively), and height (1.58 ± 2.94 metres versus 1.59 ± 3.44 metres respectively).

These results were similar to the results of Deering et al. (2004) in their study there was no statistically significant difference between the group of perineal body ≤ 3.5 cm and the group of perineal body > 3.5 cm as regard the maternal age, weight, and height.

The present study showed no statistically significant difference between the group of perineal body ≤ 3.5 cm and the group of perineal body > 3.5 cm as regard oxytocin use. This coincides with the results of Deering et al. (2004) in their study there was no statistically significant difference between both groups as regard oxytocin use.

This study showed that there was no statistically significant difference between the group of perineal body ≤ 3.5 cm and the group of perineal body > 3.5 cm as regard the duration of second stage of labor (38.4 ± 15 minutes versus 33 ± 15 minutes respectively).

This coincides with the results of Deering et al. (2004) who found no statistically significant difference between the group of perineal body ≤ 3.5 cm and the group of perineal body > 3.5 cm as regard the duration of second stage of labor.

The current study showed that there was no statistically significant difference between the group of perineal body ≤ 3.5 cm and the group of perineal body > 3.5 cm regarding infant birth weight (3.4 ± 0.34 kg versus 3.39 ± 0.35 kg respectively).

These results were similar to that obtained by Deering et al. (2004) who found no statistically significant difference between both groups as regard the infant birth weight.

In the current study there was no statistically significant difference in the mean perineal body length between nulliparous and multiparous women (3.93 ± 0.55 cm versus 3.95 ± 0.69 cm respectively).

This coincides with the results of Deering et al. (2004) in their study there was no statistically significant difference in the mean perineal body length between nulliparous and multiparous women (3.93 ± 0.55 cm versus 3.95 ± 0.69 cm respectively).

The present study showed a statistically significant difference in the incidence of perineal laceration between both groups, it was significantly higher in the group of perineal body ≤ 3.5 cm than that is in the group of perineal body > 3.5 cm.

This result was similar to the result of Walfisch et al. (2005), from Soroka University Medical center, who made a prospective study on 300 women to assess the association of perineal stretching during delivery and perineal lacerations, it was found that primigravidae with perineal lengths (≤ 4 cm) have increased incidence of perineal lacerations than that in primigravidae with perineal lengths (> 4 cm).

This coincides with the result of Rizk and Thomas (2005), in their study the episiotomy incidence was significantly higher in the group of a short perineum (< 4 cm). This difference may be due to obstetrician a factor who determine when and in whom to do episiotomy.

The study showed that the incidence of perineal laceration in the group of perineal stretching ≥ 150% is significantly higher than that is in the group of perineal stretching < 150% (55.6% versus 13.6% respectively). And this is coincides with the result of Walfisch et al. (2005) in their study there was increased rates of perineal laceration in the group of perineal stretching ≥ 150% is higher than that is in the group of perineal stretching < 150% (40.7% versus 19.5% respectively).

Conclusion A short perineum in a given patient should alert the obstetrician to the potential for complications related to perineal trauma from delivery.

The perineal stretching is significantly correlated with the degree of perineal laceration.

Episiotomy should be reserved for cases in which perineal length is originally short and significant stretching occurs during these conditions of labor.
No benefit from episiotomy for prevention of fecal and urinary in continence or pelvic floor relaxation.

No significant difference in dyspareunia, and perineal pain 6 weeks after child birth with or without episiotomy.

References