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 perinealstretching ≥ 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 perinea tears. The incidence of perineal tear was statistically significant higher in the group of perineal stretching ≥150%thanthatisin 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 perinealpainin then on-episioto my group and the episioto 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.

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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 (1): Comparison between group I and group II according demographic data.

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

This table shows statistically significant difference between groups according gestational age (wks).

Table (2): Comparison between group I and group II according genital hiatus.

Genital hiatus	Group I (PB≤3.5) [N=16]	Group II (PB>3.5) [N=84]	t/x2*	p-value
1ST Stage (cm)	3.75±0.27	3.99±0.49	-1.336	0.188
2nd stage at crawning (cm)	8.50±0.60	8.76±0.58	-1.172	0.247
24 hour after delivry (cm)	3.88±0.23	4.07±0.45	-1.199	0.237

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

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

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

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

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

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

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

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

Perineal tear	Group I (PB≤3.5) [N=16]	Group II (PB>3.5) [N=84]	Chi-square test	p-value
Present	4 (25%)	16 (19%)	0.149	0.700
Degree				
I	0 (0%)	14 (16.7%)	7.093	**0.029**
II	4 (25%)	2 (2.4%)		

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.

Stress Incontinence	Group I (PB≤3.5) [N=16]	Group II (PB>3.5) [N=84]	Chi-square test	p-value
2 wkspost partum	2 (12.5%)	0 (0%)	5.357	**0.021**
4 wkspost partum	0 (0%)	0 (0%)	0.000	1.000
6 wkspost partum	0 (0%)	0 (0%)	0.000	1.000

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.

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

Positive correlation and significant between perineal length and perineal stractching.

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 whetherornotan episiotomy will be needed, or if one is done, whether or not it will extend ***(Rizkand Thomas, 2005).***

It should be possible to plan the length of episiotomy or predict the occurred nceof 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 ma provide additional information about the ana 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 ***(Rizkand Thomas, 2005).***

The functional importance of the length of the perineum has been large lyneglected by clinicians, despite the fact that its important role in the diagnosis and classification of pelvicorgan prolapseh as recently been appreciated. A short perineal body (<3cm) was identified as being associated with weakness of the anatomical support of the pelvicviscera in their report, but without further discussion of the significance of the finding ***(Rizkand 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 sessperinealleng 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 ***(Rizkand Thomas, 2005).***

A short perineumorgenitalhiatus, prolonged second stage of labor, and low parity may be asociated with traumatic vaginal delivery and provided evidence to support the judicious use of a shorter mediolateral episiotomy or more vigilant post natal surveil lancein this group of women ***(Rizk et al., 2010).***

Perineal length has a cut-off value of 3 cm, below which the risk of severe perineal lacerations during midline and mediolateral episiotomies increases significantly ***(Aytanetal., 2010).***

Wedonot know exactly why women with a shorter than average perineal body have an increased risk of instrumental delivery. It may be that a short perineal body is indicative of either a smaller bony pelvisor a smaller vaginal opening, which may obstruct the fetus from delivering during the second stage of labor ***(Deering et al., 2004).***

The purpose of this study was to define then or malperineal body length during labor and determine if as hortened 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.

A total of 100 parturients participated in this study, a full history was taken from the women including personal history, history of the present pregnancy, pas this tory, obestetric history and family history. Detailed examination was done including general, abdominal, and local pelvic examination.

They were divided into 2 groups according to their perineal body length:-

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

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

An other 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 perinealtears.

The patients were of average age (27.52 ± 4,52 years), weight (74.50±6.53kg), height (164,52 ±6.1 meters), and BMI (27.22 ± 2.44kg/m^2). There were 50 PG (50 %), and 50 MG (50%), the meangest ationalage was (38.7± 1.11weeks).

The meanperineal body length was (4.22±0.64cm), the meange nitalhi at us length was (3.95±0.47cm). 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 (3.302±0.409kg), 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

were MG, In their study them eanage, and BMI were (28±0.5 years, and 30.6±5.1 kg/m2 respectively), the mean perineal body length was (3.9±0.7cm), them eangestational age was (39.4 ±0.11weeks), the mean birth weight(3.44±0.45 kg).

In the current study there was no statistically significant difference between the group of perineal body ≤ 3.5cmandthe group of perineal body >3.5 cm as regard the maternalage (25.78 ± 4.07years versus25.8 ±4.07years 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 ≤ 3.5cm and the group of perineal body > 3.5 cm regarding the maternalage, weight, and height.

The present study showed no statistically significant difference between the group of perineal body ≤ 3.5cmandthe 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≤3.5cm and the group of perineal body >3.5cm 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 (4.13±0.46 cm versus 4.04 ± 0.49cm 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±0.69cm respectively).

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

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 (≤4cm) have increased incidence of perinealtears than that in primigravidae with perineal lengths (>4cm).

This coincides with the result of ***Rizkand Thomas (2005)***, from United Arab Emirates University. An observational study was conducted in Al-Ain Hospital. The perineal body length of 212 women was measured, all were primigravidae to assess the relationship between the length of the perineum and position of the anus and vaginal delivery inprimigravidae, it was found that there was increased incidence of perinealtearin the group of short perineum (<4cm).

In the current study there was no statistically significant difference in the incidence of episiotomy between the group of perineal body ≤ 3.5 cm and the group of perineal body>3.5cm. This coincides with the result of ***Deering et al. (2004)*** in their study there was no significant difference in the incidence of episiotomy between the group of perineal body ≤3.5cmandthe group of perineal body > 3.5cm.

Comparing to the results obtained by **Rizk and Thomas (2005)**, in their study the episiotomy incidence was significantly higher in the group of a short perineum (<4cm). This difference may be due to obstetrici a factor who determine when and in whom to do episio to my.

The study showed that the incidence of perineal tear 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 perinealtearin 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 obstetrici an to the potential for complications related to perineal trauma from delivery.

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

Episiotomy should be reserved for casesin which perineal length is originally short and significant stretching occurs during these condstage 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.

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