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3rd and 4th Degree Perineal Tears that Occurs During Vaginal Delivery

Mustafa Senturk[1], Yusuf Yavuz[2]

[1] Necmettin Erbakan University, Meram School of Medicine, Department of General Surgery, Konya, Türkiye.
[2] Sanliurfa Training and Research Hospital, Clinic of General Surgery, Sanliurfa, Türkiye.

Correspondence Author: Mustafa Senturk
E-mail: m-sntrk@hotmail.com
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ABSTRACT

Objective: Perineal injuries are common in vaginal delivery. In this study, we aimed to investigate the factors affecting the degree of perineal injury and the effect of injury degree on incontinence.

Methods: Fifteen patients, underwent sphincter repair by the general surgery unit, who had perineal tear during normal vaginal delivery between January 2018 and March 2019 in our hospital and were retrospectively evaluated. Those with grade 3a and 3b perineal tears were divided into 2 groups as group-1, and those with grade 3c and grade 4 perineal tears as group-2. Episiotomy type, fetal characteristics [head circumference and birth weight], early postoperative continence findings were compared in between groups.

Results: The average age of the patients was 30 ± 8.7 years. When the groups were compared, there was no significant superiority of episiotomy in terms of perineal injury (p=0.07). 4 patients had 3a, 3 patients had 3b, 6 patients had 3c and 2 patients had fourth-degree perineal injuries. The average birth weight of the newborns was 3438 ± 492 g, and the head circumference was 34.33 ± 1.23 cm. There was no significant difference in incontinence between the groups (p=0.55).

Conclusion: The treatment of anorectal injuries is surgery. The method of treatment varies according to the time elapsed between injury and intervention, fecal contamination, degree of injury, general condition of the patient, presence of accompanying injury, experience and preference of surgeon. We think that sphincter damage during delivery can be looked after successfully with early diagnosis and intervention before tissue edema develops.

Keywords: Perineal Tears, Fecal incontinence, Sugical treatment

1. INTRODUCTION

Perineal injury is one of the major complications during vaginal delivery. Perineal injury can develop during urological, gynecological and coloproctological interventions. [1,2]. Classification of perineal injury is used for grading perineal injury. Obstetric anal sphincter injury, including third and fourth degree perineal tears, occurs in approximately 3% of women after their first birth and 0.8% of women who have had at least one previous birth [3]. It has also been reported that the true incidence can be as high as 11% in some series [4]. There are publications in England and Norway showing that the incidence has increased in recent years [5,6]. It is unclear whether these changes are due to an actual uplift or greater awareness.

A perineal tear during delivery is an important cause of short and long term maternal morbidity. Urinary incontinence, anal incontinence, perineal pain, sexual dysfunction may cause many problems after perineal injury. Anal incontinence has been reported by 4.3% of women aged 15 to 60 years with or without injury to the perineum. [7]. Intestinal symptoms in women with perineal injuries vary between 7.6% and 61% depending on parity and injury type. [8]. Risk factors for perineal injuries involving anal sphincter include gestational age, nulliparity, duration of delivery, occipitoparietal diameter and birth weight. Episiotomy is controversial some studies have shown that the risk is reduced with a mediolateral incision, while in others it is increased or unchanged [9]. In this study, we aimed to investigate the factors affecting the degree of perineal injury and the effect of injury degree on incontinence.

2. METHODS

We retrospectively evaluated patients who have perineal injuries during normal vaginal delivery and underwent sphincter repair by general surgery unit in our hospital between January 2018 and March 2019. The study was conducted according to the Declaration of Helsinki. The patients identified

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for this series were retrieved from the surgical department records. Ethics committee approval was received for this study (E2-22-1623). During this period, the total number of 35.614 deliveries takes place in our hospital, including 23.816 spontaneous vaginal delivery and 11.798 cesarean delivery. Patients with first degree and second-degree perineal injury were not included in the study. Only perineal injury of 3rd degree and above was included [Table-1] [10]. The perineal injury classification was used to determine treatment and the degree of rectal injury. The degree of injury was determined by intraoperative physical examination.

Table 1. *Classification of perineal injury*

Grade 1	Laceration of the vaginal mucosa or perineal skin only
Grade 2	Laceration involving the perineal muscles
Grade 3	Laceration involving the anal sphincter muscles, being further subdivided into 3A, 3B, 3C:
3A	Where <50% of the external anal sphincter is torn
3B	Where >50% of the external anal sphincter is torn
3C	Where the external and internal anal sphincters are torn
Grade 4	Laceration extending through the anal epithelium (resulting with a communication of the vagina epithelium and anal epithelium)

Those with grade 3a and 3b perineal tears were divided into 2 groups as group-1, and those with grade 3c and grade 4 perineal tears as group-2. Age, parity, episiotomy type, fetal characteristics [head circumference and birth weight], anesthesia type, first intervention time, instrumentation during delivery, perineal injury classification, surgical intervention, and early postoperative continence findings were compared in between groups. Data of 18 patients were collected. Fifteen patients with complete data were included. Written consent was obtained from all patients for surgical procedures.

2.1. Surgical Technique

End-to-end repair was performed in all our cases. The ends of the torn muscle were grasped with Allis forceps and end-to-end repair was performed with 3/0 or 2/0 polyglactin sutures. Because overlap can be technically difficult, a torn internal sphincter mattress or single interrupted sutures should be approximated.

In addition to preoperative antibiotic prophylaxis, all patients were administered with post-operative broad-spectrum antibiotics. Medical constipation was achieved with the drug containing diphenoxylate + atropine sulfate active ingredients, preventing the wound from contacting with stool. Medical constipation was achieved for three days postoperatively. Oral food intake was started on the third postoperative day. Perineal examination and digital rectal examination was done at the postoperative follow-up and regular policlinic examination. They were advised to avoid vaginal delivery. In all patients, treatment with laxatives was started to promote bowel.

We used the Cleveland Clinic Florida Fecal Incontinence Score (CCFIS) system [Table-2] [11]. Scoring was done according to the follow-up data in the system. Patients whose follow-up did not come were called for control. There was no anorectal manometry in our hospital; Therefore, patients were referred to comprehensive centers.

Table 2. *Cleveland Clinic Florida Fecal Incontinence Score (CCFIS)*

	Frequency				
	Never	Rarely	Sometimes	Usually	Always
Solid stool leakege	0	1	2	3	4
Liquid stool leakege	0	1	2	3	4
Gas leakege	0	1	2	3	4
Pad use (for stool)	0	1	2	3	4
Lifestyle restriction	0	1	2	3	4

Never = 0; Rarely = <1/month; Sometimes = <1/week but >1/month; Usually = <1/day but >1/week; Always = >1/day.

2.2. Statistical Analysis

Social Science Statistical Package 22.0 (SPSS Inc., Chicago, IL, USA) software was used for biostatistical analysis. Kolmogorov-Simirmov and Shapiro-Wilk tests were used to check the distribution of parameters. Mann Whitney U test was used for comparison of independent groups and Fisher's exact chi-square tests in cross tables were used for categorical data. In the interpretation of the statistical hypothesis tests, a type 1 error was accepted as 0.05.

3. RESULTS

The average age of the patients was 30 ± 8.7 years. The mean number of delivery was 3 (min-max: 1-7). 14 patients underwent spinal anesthesia and 1 received general anesthesia during normal vaginal delivery and underwent surgery due to third and fourth-grade perineal tears. The mean duration of the first intervention was 70 minutes (min-max: 30-90 minutes). Episiotomy was performed in 11 patients (73.3%). When the groups were compared, there was no significant superiority of episiotomy in terms of perineal injury (p = 0.07). 4 patients had 3a, 3 patients had 3b, 6 patients had 3c and 2 patients had fourth-degree perineal injuries [Figure 1]. In 3 of the cases, birth weight was over 4000 g. The average birth weight of the newborns was 3438 ± 492 g, and the head circumference was 34.33 ± 1.23 cm . On the postoperative first day, rectal examination of the patients it was showed that sphincter tone decreased. On the 7th day, rectal examination showed that sphincter tones were more active than the first day examination but decreased compared to normal. Colostomy was not performed in any patient. 2 patients (13.4%) had less than one gas incontinence per month, 1 patient (6.7%) had less than one gas and stool incontinence per month. There was no significant difference in incontinence between the groups (p=0.50) [Table-3]. The average follow-up period was 9.8 ± 4 months. None of the patients developed surgical complications.

Table 3. *Properties of the groups and comparison results*

		Group-1 (Grade 3a-3b)	Group-2 (Grade 3c-4)	P
Incontinens	Yes	1 (14.2%)	2(25%)	**0.55**
	No	6(85.8%)	6(75%)	
Episiotomy	Done	7(100%)	4(50 %)	**0.07**
	No	0(0%)	4(50%)	
Head circumference(cm) (mean±SD)		34.1 ± 1.4	34.5 ± 1	**0.69**
Birth weight (g) (mean±SD)		3335 ± 424	3527 ± 558	**0.53**

SD: Standart Deviation

Figure 1. *A patient with type 3b injury*

Figure 2. *Post-repair image*

Table 4. *Demographic characteristics of patients (n=15)*

	n	%	Mean±SD
Age (Years)			30±8.7
Number of delivery			3(1-7)
Anesthesia type			
General	1		
Spinal	14		
Time to first intervention (Minute)			70±24
Grade of injury			
Grade 3A	5	33.3%	
Grade 3B	3	20%	
Grade 3C	5	33.3%	
Grade 4	2	13.4%	
Episiotomy			
Done	11	73.3%	
None	4	26.7%	
Birth weight of the newborns (gr)			3438±492
Head circumference (cm)			34.33 ± 1.23
İncontinens			
Gas	2	13.4%	
Gas+stool	1	6.7%	
None	12	80%	
Average follow-up (month)			9.8 ± 4

4. DISCUSSION

The morbidity rate is high in perineal tears during delivery. Fecal incontinence is one of the most important of these. Obstetric trauma or sphincter defects after perianal field surgery are the main causes of stool incontinence. During vaginal delivery, 53% to 79% of patients have varying degrees of perineal injury. [8,12]. Rectal examination should be performed in vaginal deliveries so that perineal tears are not overlooked. Maternal or fetal features may cause perineal injuries. Fetal factors include abnormal presentation, birth weight, and head circumference, while maternal factors include rapid presentation, pelvic length, and tissue characteristics. [13]. A large volume study reported an association between shoulder dystocia and perineal injury [8]. Every 100 grams increase in birth weight caused a 10% increase in the rate of perineal injury. There were 3 children with shoulder dystocia. Their weight was over 4000 grams. One of the patients had a fetus over 4000 g, the other had a fetus transverse position and althought the last one had a low fetus weight, a perineum injury occurred for the pelvic incompatibility groove [Table-4].

The rate of anal sphincter injury in vaginal deliveries is approximately 18% [14]. In patients with sphincter injury at birth, the rate of fecal incontinence is 7.7% [15]. The incontinence rate is 6.3% in nulliparous women, 8.8% in

uniparous women and 8.4% in secundiparous women and 11.5% in triparous women and women with more than 3 deliveries [16]. In a study of patients with normal vaginal delivery, it was reported that complaints about incontinence ranged from 13% to 25% [17]. Two patients (13.4%) had less than 1 gas incontinence per month, 1 patient (6.7%) had less than 1 gas and stool incontinence per month. 3 patients (20%) were nulliparous and 12 patients (80%) were multipara.

It is reported in the literature that early intervention is a key factor in recovery [13]. The mean duration of the first intervention was 70 minutes (min-max: 30-90 minutes).

There are publications stating that episiotomy increases or decreases the risk of perineal injury [8]. In our study, 73.3% of our patients underwent episiotomy. When the groups were compared, there was no significant superiority of episiotomy in terms of perineal injury ($p = 0.07$). We found that episiotomy did not affect the risk of 3rd or 4th degree perineal injury. The low number of patients is also a factor in this result.

There is insufficient data to determine whether the next delivery of a patient with perineal injury after vaginal delivery is vaginal or caesarean section delivery. A vaginal delivery performed in a patient with perineal injury has been reported to have a 3% risk of re-anal sphincter injury [8]. We do not recommend vaginal delivery to prevent possible injury.

The first option in anal sphincter defect is sphincter repair. Perioperative second-generation cephalosporin antibiotic prophylaxis has been shown to reduce the rate of postoperative infection [19]. In sphincter repair performed after vaginal delivery injury, the infection rate can reach up to 20% [20]. None of our patients had surgical site infections. We use metronidazole and third generation cephalosporin for prophylaxis in our patients and we complete this treatment for 5 days. We think that the susceptibility to infection increases in the surgical area if vaginal discharge is high after delivery. For this reason, we pay attention to vaginal dryness.

All layers must be repaired separately. The internal and external sphincter should be repaired separately. The posterior anal canal mucosa and the anterior vaginal wall should be repaired separately. In the literature, there was no difference between overlapping and end-to – end suturing as a repair technique [21]. We performed end-to-end repairs in all our cases [Figure 2].

Although there is no significant difference between pelvic floor muscle training and biofeedback treatment, studies are suggesting early postnatal biofeedback treatment in symptomatic women with perineal injuries [18]. During follow-up up to 1 year, one of our cases had stool and two had gas incontinence. We have directed our patients with gas or stool incontinence to the centers where biofeedback treatment is applied. However, because of the low socioeconomic and sociocultural levels of our patients, none of our patients received this treatment. All of our results consisted only of patients who had performed pelvic floor exercises at home. This is one of the limitations of our study.

5. CONCLUSION

Sphincter repair should be done in experienced centers to obtain better results. Surgical repairs should be made in the early stages of injuries. It is known that the sphincter ends torn in the late intervention will separate more with time and repair in the late period may be more difficult. We think that sphincter damage during delivery can be looked after successfully with early diagnosis and intervention before tissue edema develops.

Authors' contributions *(Authors initials)*

Design of the study: MS

Acquisition of data for the study: YY

Analysis of data for the study: MS, YY

Interpretation of data for the study:

Drafting the manuscript: MS

Revising it critically for important intellectual content: MS, YY

Conflicts of interest

All authors have disclosed no conflicts of interest.

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