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Original Article / Özgün Makale

Does the severity of anal fissure trigger constipation?

Anal fissürün şiddeti kabızlığı tetikler mi?

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Abstract

Objectives: The aim of this study was to investigate the effect of the severity of anal fissure on the occurrence of constipation.

Patients and methods: Between January 2021 and February 2023, a total of 141 patients (66 males, 75 females; median age: 3 years; range, 3 to 6 years) who were diagnosed with anal fissure according to the Rome IV criteria in our clinic were retrospectively analyzed. The number of anal fissures was rated as mild if it was 1-2, moderate if it was 3-4, and severe if it was 5 or more. The patients' ages, sex, number of fissures, and the number of patients with constipation complaints were recorded.

Results: Of a total of 141 anal fissure patients, 15 complained of constipation. The number of patients with moderate and severe fissures who experienced constipation was found to be significantly higher than those who did not. However, the constipation problem in patients with mild fissure was significantly less than in those without anal fissure.

Conclusion: There is a highly significant positive relationship between anal fissure severity and constipation. The risk of moderate and severe anal fissure increases the likelihood of triggering constipation.

Keywords: Anal fissure, child, constipation, severity.

Öz

Amaç: Bu çalışmada anal fissür şiddetinin kabızlık oluşumu üzerine etkisi araştırıldı.

Hastalar ve Yöntemler: Ocak 2021 - Şubat 2023 tarihleri arasında kliniğimizde Rome IV kriterlerine göre anal fissür tanısı konan toplam 141 hasta (66 erkek, 75 kadın; ort. yaş: 3 yıl; dağılım, 2-6 yıl) retrospektif olarak incelendi. Anal fissür sayısı 1-2 ise hafif, 3-4 ise orta ve 5 ve üzeri ise şiddetli olarak derecelendirildi. Hastaların yaşı, cinsiyeti, fissür sayısı ve kabızlık şikayeti olan hasta sayısı kaydedildi.

Bulgular: 141 anal fissür hastasından 15'inde kabızlık şikayeti vardı. Orta ve şiddetli derece fissür yaşayan hastalarda kabızlık yaşayanların sayısı, yaşamayanlardan anlamlı olarak daha yüksek bulundu. Ancak, hafif derece fissür yaşayan hastalarda kabızlık problemi, anal fissüre sahip olmayanlardan anlamlı olarak daha az bulundu.

Sonuç: Anal fissür şiddeti ile kabızlık arasında yüksek oranda anlamlı bir pozitif ilişki mevcuttur. Orta ve şiddetli derece anal fissür riski kabızlığı tetikleme olasılığını artırmaktadır.

Anahtar sözcükler: Anal fissür, çocuk, kabızlık, şiddet.

Anal fissure is a very common clinical problem in childhood.[1] It is usually observed as linear or teardrop-shaped mucosal tears extending from the anal margin to the dentate line.[2] In the period following the formation of anal fissure, the feeling of pain associated with passing stool causes constipation in children. After constipation, stool hardness and size increase, causing a vicious circle.[3]

Although the theory that constipation causes direct trauma to the minor resistance area on the posterior wall during the passage of stool through the anal canal seems plausible, the fact that a significant portion of cases with anal fissure do not have constipation and may even have diarrhea makes this theory insufficient. All this information shows us that

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the relationship between anal fissure and constipation is still controversial and remains unclear.[4,5]

Due to this unclear relationship between anal fissure and constipation, in the present study, we aimed to investigate the effect of the severity of anal fissure on the occurrence of constipation.

PATIENTS AND METHODS

This single-center, retrospective study was conducted at Lokman Hekim Van Hospital, Department of Pediatric Surgery between January 1st, 2021 and February 26th, 2023. Medical records of the patients aged between 0 and 17 years who were diagnosed with anal fissure were analyzed. A total of 141 anal fissure patients (66 males, 75 females; median age: 3 years; range, 3 to 6 years) were included in the study. The patients' ages, sex, number of fissures, and the number of patients with constipation complaints were recorded.

The number of fissures was rated as 1-2 mild, 3-4 as moderate, and 5 and above as severe. Patients who were on laxative-purgative drugs and suspected of anal intercourse, those with comorbidities such as neurological, anatomic, metabolic, endocrine, congenital problems and patients whose data were not clearly available were excluded from the study. Functional constipation accompanying anal fissure was evaluated by applying Rome IV criteria and the diagnosis was made in this way.[6]

Statistical analysis

Statistical analysis was performed using the IBM SPSS version 26.0 software (IBM Corp., Armonk, NY, USA). While the normality assumption of quantitative data was examined with the Shapiro-Wilk test, the homogeneity of the population variances of the groups was checked with the Levene test. Not all quantitative data met the assumption of normality. Quantitative variables were presented in median (min-max) and the first and third quartile values. Qualitative variables were expressed in number and frequency. The Mann-Whitney U test was used to compare the ages of the patients according to their sex and constipation status. When the patients were grouped according to their fissure levels, the Kruskal-Wallis test was used to compare their ages. Dependency and differences between categorical variables were analyzed using the chi-square (χ^2) and Fisher exact tests. Box-plots were used to show the distribution of quantitative variables between groups. The Spearman correlation analysis was used to examine the relationship structure between fissure severity and the presence of constipation. Error bars were calculated at the 95% confidence level (CI). A two-sided p value of <0.05 was considered statistically significant.

RESULTS

Baseline characteristics of the patients are shown in Table 1. Male patients were older than female

TABLE 1
Baseline characteristics of patients

	Min	Q1	Median	Q3	Max
Sex					
Female	0.03	1.00	3.00	6.00	18.00
Male	0.05	2.00	4.00	8.00	15.00
Fissure severity					
Mild fissure	0.03	2.00	4.00	6.00	18.00
Moderate fissure	0.05	1.00	2.00	6.00	15.00
Severe fissure	0.40	1.70	4.50	7.50	9.00
Constipation					
Absence	0.05	2.00	3.50	6.00	18.00
Presence	0.03	1.00	2.00	6.00	15.00

Min: Minimum; Max: Maximum; Q1: Percentile 25; Q3: Percentile 75.

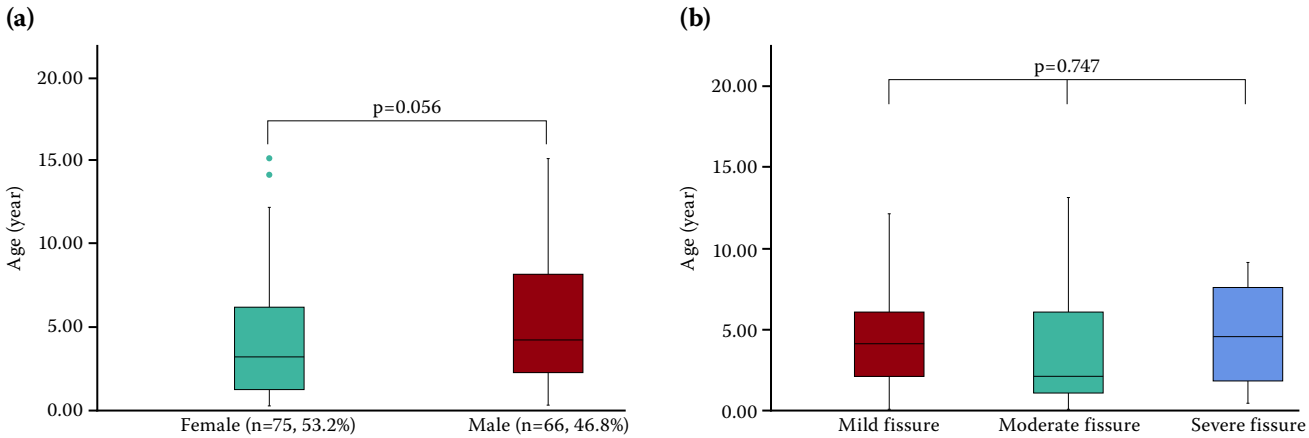


Figure 1. **(a)** Comparison of patients' ages according to their sex. The *p* value indicates the Mann-Whitney U analysis result. **(b)** Comparison of patients' ages according to the severity of the fissure.
The *p* value indicates the result of Kruskal-Wallis analysis.

patients, while age was not significantly different between the two sexes (p=0.056, Figure 1a). The median ages of patients with mild and severe anal fissures were 4 and 4.5 years, respectively, while the median age of patients with moderate anal fissures was 2 years (Table 1). However, there was no statistically significant difference between the ages of patients with anal fissures of different severity (p=0.747, Figure 1b).

The median and quartile values for the ages of patients without and with constipation were 3.5 (2-6) and 2 (1-6) years, respectively (Table 1). However, when the distribution between constipation status and age variable was analyzed, no significant difference was observed between the ages of patients with constipation and patients without constipation (p=0.397, Figure 2a). While 15 (10.6%) of the patients experienced constipation, 126 did not complain of constipation (Table 2). Of the 15 patients experiencing constipation, five (3.5%) were boys and 10 (7.1%) were girls (Table 2). However, there was no significant difference in terms of sex between patients with or without constipation (p=0.269, Figure 2b).

In our study 85.8% (n=121) had mild, 11.3% (n=16) moderate, and 2.8% (n=4) severe anal fissure. (Figure 3). Among patients with mild-to-moderate

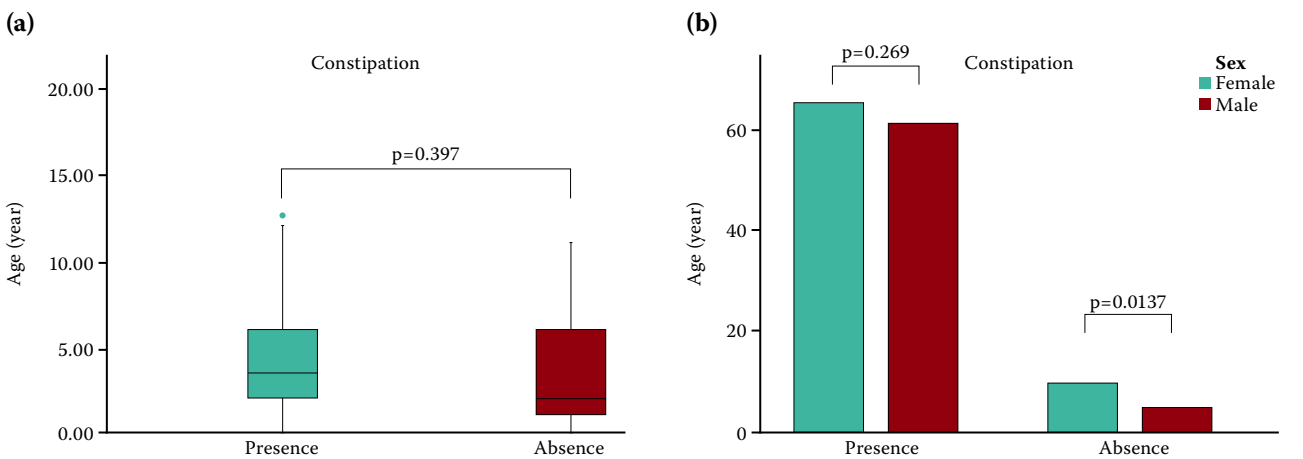
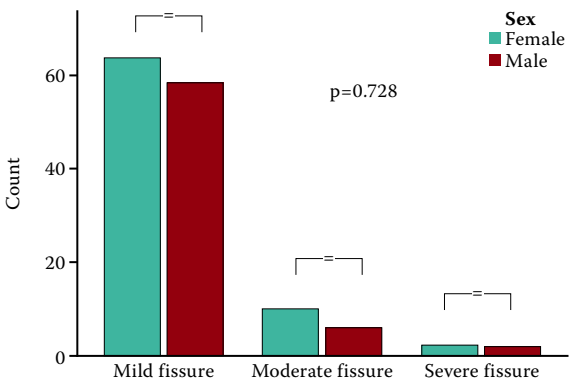


Figure 2. **(a)** Comparison of patients' ages according to constipation status. The p value indicates the Mann-Whitney U analysis result. **(b)** Comparison of constipation status of patients according to sex.
The *p* value indicates the Fisher exact chi-square test analysis result.

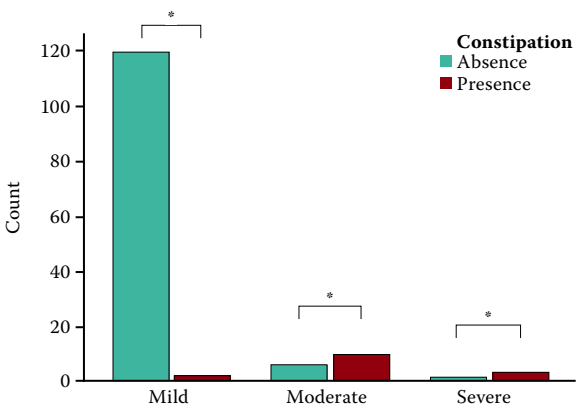
TABLE 2
Constipation conditions according to sex

			Sex		
			Female	Male	Total
Constipation	Absence	Count	65	61	126
		Total (%)	46.1	43.3	89.4
	Presence	Count	10	5	15
		Total (%)	7.1	3.5	10.6
Total		Count	75	66	141
		Total (%)	53.2	46.8	100.0



			Sex		
			Female	Male	Total
Fissure levels	Mild fissure	Count	63	58	121
		Total (%)	44.7	41.1	85.8
	Moderate fissure	Count	10	6	16
		Total (%)	7.1	4.3	11.3
	Severe fissure	Count	2	2	4
		Total (%)	1.4	1.4	2.8
Total		Count	75	66	141
		Total (%)	53.2	46.8	100.0

Figure 3. Comparison of fissure severity according to the sex of the patients.
The *p* value indicates the Fisher exact chi-square test analysis result.



			Constipation		
			Absence	Presence	Total
Fissure levels	Mild fissure	Count	119	2	121
		Total (%)	84.4	1.4	85.8
	Moderate fissure	Count	6	10	16
		Total (%)	4.3	7.1	11.3
	Severe fissure	Count	1	3	4
		Total (%)	0.7	2.1	2.8
Total		Count	126	15	141
		Total (%)	89.4	10.6	100.0

Figure 4. Comparison of fissure severity according to constipation status. *p<0.001 value was considered significant.
* P value indicates the Fisher exact chi-square test analysis result.

fissures, the number of female patients was higher than male patients. However, the number of boys and girls in patients with severe fissures was equal. However, there was no significant effect of sex variable on the severity of anal fissure experienced by the patient (p=0.728, Figure 3).

Of the 15 patients with constipation, 1.4% (n=2) had mild fissure, 7.1% (n=10) had moderate fissure, and 2.1% (n=3) had severe fissure (Figure 4). Constipation was present in 1.65% (n=2) of patients with mild fissures, 62.5% (n=10) of patients with moderate fissures and 75.0% (n=3) of patients with severe fissures (Figure 4). In the group of patients with anal fissure of mild severity, the number of those who did not experience constipation was higher than those who experienced constipation (p<0.001, Figure 4). However, in patients with moderate and severe fissures, the number of patients experiencing constipation was significantly higher than those without constipation (p<0.001, Figure 4). Accordingly, moderate and severe anal fissure risk increased the likelihood of constipation.

Additionally, a highly significant positive relationship was found between fissure severity and the presence of constipation (r=71.9%, p<0.001), supporting the view that fissure severity increased the likelihood of triggering constipation.

DISCUSSION

Although anal fissure is a common clinical problem, epidemiologic data on it are limited.[1] It was recognized as a disease for the first time in 1934. Although it can be observed at all ages in childhood, it is observed much more frequently between six and 36 months. It is observed equally in both sexes.[2,5] In our study, anal fissure was observed with similar rates in both sexes in accordance with the literature. However, the age of onset was more common at the ages of three to four years, which is different from the literature. However, age and sex were not statistically significant.

The causes leading to anal fissure in children can be listed as constipation, straining during defecation, anatomical factors, diseases leading to inflammation in the anorectal region, especially inflammatory bowel diseases, and prolonged diarrhea.[4] It is difficult to conclude the actual prevalence of constipation.[7,8] Studies have reported the incidence of functional constipation in children attending general pediatric services to be 3%.[9] In our study, the rate of constipation is 10.6%, which was higher than the literature. This rate shows us that the majority of patients with anal fissures have constipation problems. In addition, the fact that the problem of constipation was considerably higher in cases where the degree of anal fissure increased shows us that the question of whether anal fissure triggers constipation in moderate and severe anal fissure cases should be reconsidered.

Although there are various theories about the pathophysiology of anal fissure, the exact cause is still unclear.[10] Avoidance of defecation by the patients due to fear of pain after anal fissure formation undoubtedly leads to hardening of the stool. Investigations performed in cases with anal fissure revealed excessive activity in the internal anal sphincter and an increased resting anal pressure. This sphincter spasm turns into a vicious cycle in the form of anal pain-fear of defecation-solid fecal passage that further stimulates internal sphincter activity.[4,11] However, the fact that a significant proportion of patients with anal fissure do not have constipation and may even have diarrhea makes this theory inadequate.[4] These data show us that we should question the relationship between anal fissure and constipation. There are no literature data on the relationship between the number of anal fissures; i.e., the severity of anal fissures, and constipation. It is obvious that our study would shed light to the literature on this subject. In our study, it is seen that constipation problem is triggered in moderate and severe cases where the number of anal fissures is three or more.

The retrospective nature of our study is the main limitations to this study. However, the fact that it is the first study in the literature to investigate the relationship between the severity of anal fissure and constipation was considered as an important strength. Moreover, there is no doubt that this study would be a source of inspiration for other studies to be conducted in the future.

In conclusion, there was a high positive correlation between moderate and severe anal fissure and constipation. Based on these findings, we conclude that as the severity of anal fissure increases,

the likelihood of constipation complaints increases. However, we believe that similar studies should be performed in larger populations for definitive data, as constipation problem is relatively less in patients with mild anal fissure.

Ethics Committee Approval: The study protocol was approved by the Van Training and Research Hospital Clinical Research Ethics Committee (date: 31.03.2023, no: 2023/07-001). The study was conducted in accordance with the principles of the Declaration of Helsinki.

Patient Consent for Publication: A written informed consent was obtained from the parents and/or legal guardians of the patients.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Author Contributions: Idea/concept, literature review: V.A., Design, control/supervision, data collection and/or processing, analysis and/or interpretation, writing the article, critical review, references and fundings, materials: V.A., M.T.H.

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