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Evaluation of impairment in fine motor skills in patients with major depressive disorder

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This study was conducted in accordance with the principles of the Declaration of Helsinki, following the approval of the Ethics Committee of the Faculty of Medicine at Kırıkkale University, dated 28th April 2011, and numbered 2011/0052.

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No conflict of interest was declared by the authors.

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Abstract

Background/Aim: Major Depressive Disorder (MDD) is a prevalent psychiatric condition linked to chronic conditions, suicide and relapse, leading to disability. Fine motor skills (FMS) can potentially provide valuable insights into the suspected psychomotor slowing associated with depression. This experimental, observational study aims to use a fresh paradigm to probe how the slowing of FMS impacts MDD patients, particularly in relation to motor and cognitive processes.
Methods: This study involved 28 patients with MDD and 28 healthy control subjects. We developed the Serial Reaction Time Task (SRTT), Finger Tapping Test (FTT), and Target Hitting Test (THT) to examine the impact on FMS in relation to motor and cognitive processes. The THT incorporates cognitive elements like strategy and action monitoring and assimilates the other two tests. Participants were asked to complete the SRTT, FTT, THT, Beck Depression Inventory (BDI), and Beck Anxiety Inventory (BAI) in two separate sessions.
Results: We found significant differences between the groups across BDI, BAI, FTT, and SRTT data ($P<0.001$ for BDI, BAI, $P=0.019$ for FTT, $P=0.032$ for SRTT). There was also a noticeable difference in THT performance among the groups ($P=0.013$). The disparity between the depression group and the control group was primarily attributed to the THT error score ($P=0.003$). We noted that when BDI and SRTT scores increased, THT target values decreased ($P=0.001$ and $P<0.001$, respectively), but they increased with higher FTT scores ($P<0.001$). The depression group performed worse than the control group on all three computerized tests related to FMS (SRTT, FTT, THT). The poorer performance of patients with depression in THT was mostly due to THT error values. This suggests that these patients may have exerted more effort on motor performance to hit the target, compensating with physical effort rather than applying the necessary cognitive strategy required by the test.
Conclusion: This study's findings indicate that MDD primarily impacts cognitive functions while also impairing FMS.

Keywords: cognitive, depressive, depression, psychomotor, fine motor skills

Introduction

Major depressive disorder (MDD) is characterized by symptoms such as a depressed mood, diminished interest in activities, slowed thinking, speech, and movement, feelings of worthlessness, negativity, and a decrease in physiological functions [1]. The increased prevalence of depression has branded it a significant health problem worldwide, given its high risk of becoming chronic, recurrent, and leading to suicide, workforce loss, and disability [2,3]. Furthermore, its impact on disability and adverse outcomes emphasizes its importance in diagnostic, treatment, and preventive approaches. Psychomotor retardation, characterized by a slowed-down evaluation of direct behavioral movements such as speaking, facial expressions, eye movements, self-touch, posture, and general motion degrees, is a symptom of depression [1,4]. Various studies examining psychomotor behavior in depression have explored different behavioral clusters using varied methods. It is speculated that observing fine motor skills could reveal the processes behind psychomotor retardation. Research on fine motor skills mainly assesses hand and finger movements, using experimental models to measure cognitive and motor processes both separately [5,6] and collectively [7,8].

While some studies have inferred conclusions without entirely differentiating between motor and cognitive components [7,8], others have attempted interpretations by investigating the relationship between these two distinct elements [9]. However, assessing motor tests alongside a fine motor skills test, which incorporates cognitive processes like strategy and action monitoring, could provide a more accurate insight into the relationship between cognitive and motor processes. Hence, this study aims to scrutinize both cognitive and motor processes separately through the introduction of a novel paradigm system.

Materials and methods

The study involved 28 patients diagnosed with MDD and 28 healthy volunteers. We excluded patients with organic brain syndrome, dementia, mental retardation, and substance addiction. In addition, those with psychotic symptoms, bipolar disorder, obsessive-compulsive disorder, panic disorder, generalized anxiety disorder, somatoform disorder, post-traumatic stress disorder, eating disorders, and personality disorders were not included. Patients with neurological diseases such as epilepsy, Parkinson's disease, and cerebrovascular disease, along with metabolic diseases such as diabetes, thyroid disease, and kidney failure, were also excluded. We did not consider patients using any of the following medications: antidepressants, antipsychotics, anticonvulsants, anxiolytics, hypnotics, sedatives, anticholinergics, antihistamines, steroids, antihypertensives, antiarrhythmics, antidiabetics, or antithyroid drugs. Finally, those who had received electroconvulsive therapy within the last 6 months, as well as pregnant or breastfeeding women, were not included in the study.

In the study, participants provided demographic information and took the Beck Depression Inventory and Beck Anxiety Inventory to assess depression and anxiety levels. They also took three performance tests during the same session: the Finger Tapping Test (FTT), the Serial Reaction Time Test (SRTT), and the Target Hitting Test (THT).

The FTT, a purely motor test used to assess motor performance since the 19th century, involves rapidly pressing the left mouse button over 15 seconds [10]. Reports indicate this test correlates with high intelligence and neuropsychological test scores. Variations of the FTT, such as tapping a table or digital screen or snapping fingers, have been used [6,11–14]. In this study, the FTT score was the number of mouse clicks in 15 seconds.

The SRTT, which has been used extensively in recent studies, measures the participants' response to stimuli on a computer screen. The study varied the stimulus intervals between 1 and 2 seconds, avoiding predictable patterns and focusing participant attention. Participants had to click the mouse button corresponding to the stimulus side as quickly as possible. The test measured attention and visuomotor performance through the accuracy and speed of their responses [15].

The THT combined elements of the FTT and SRTT, requiring participants to monitor and strategize actions. Participants tried to move an on-screen black box as far right as possible by hitting a moving target red cube. Successful hits moved the box right; errors moved it left. The cube's random movements, between four fixed points each second, added difficulty. Thus, the THT measures participants' ability to strategize, monitor their actions, and respond accurately to stimuli.

The test is divided into two sessions of 30 seconds each. It records the total count of errors and target hits in three segments, each lasting 10 seconds. This way, it tracks performance fluctuations throughout the test. This setup reveals how subjects monitor their performance and accordingly devise strategies. Thus, successful test performance leans more on strategic thinking than merely on rapid mouse clicks. To succeed, one must swiftly move the mouse icon to the target point, anticipate the target's next move, and quickly respond when it shifts.

Statistical analysis

First, to determine if THT incorporates cognitive components such as strategy development and action monitoring, we performed an analysis of variance (ANOVA) on the THT error and target values from the control group. Our hypothesis suggested that enhanced test performance would correlate with cognitive functions, implying a significant segment effect. The segments (divided into the first, second, and third 10-second intervals each session) and sessions (first and second 30-second sessions) served as independent variables.

We also examined the possible habituation effect by comparing the total stroke numbers (THT error + THT target hit) in the first and second sessions for the control group using a paired T-test. We calculated the total stroke count for the first and second sessions and used a Student-T-test to assess any discrepancies between the groups.

Right-hand FTT values, BDI, BAI and SRTT scores were separately compared using a Student-T-test. A MANCOVA included right-hand finger tapping and Serial Reaction Time Test values and BDI scores as covariates. THT target high and THT error scores served as dependent variables, while the group

(depression and control), session, and segment served as independent variables. If significant findings arose, a post-hoc ANOVA identified the root of those differences (error, target, or both).

SPSS version 21.0 was used for all statistical analyses, with a significance level of α=0.05. We employed post-hoc G*Power analysis to ascertain the study's power and sensitivity to significant variations. With a sample size of 28 for both groups and an effect size of 0.8, the study's actual power was determined to be 83.64%.

Results

Significant differences in BDI (*P*=0.001), BAI (*P*=0.001), FTT (*P*=0.019), and SRTT (*P*=0.032) scores were observed between the groups (Table 1). Likewise, a discrepancy in THT performance was noted between the groups (*P*=0.013). Within and between the sessions, THT scores also varied (*P*<0.001 and *P*=0.003, respectively). The score variance for THT error was a distinctive difference between the depression and control groups (*P*=0.003).

Table 1: The differences between the groups in age, BDI, BAI, FTT and SRTT scores

	Group	n	Mean (SD)	*P*-value
Age	Control	28	27.35 (6.57)	0.687
	Depressive	28	26.67 (5.92)	
BDI	Control	28	5.857 (3.83)	**<0.001**
	Depressive	28	24.25 (6.92)	
BAI	Control	28	5.60 (5.85)	**<0.001**
	Depressive	28	21.78 (10.03)	
FTT	Control	28	80.96 (8.37)	**0.019**
	Depressive	28	74.71 (10.78)	
SRTT	Control	28	28.65 (3.67)	**0.032**
	Depressive	28	32.02 (7.15)	

SD: standard deviation, BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory, FTT: Finger Tapping Test, SRTT: Serial Reaction Time Task

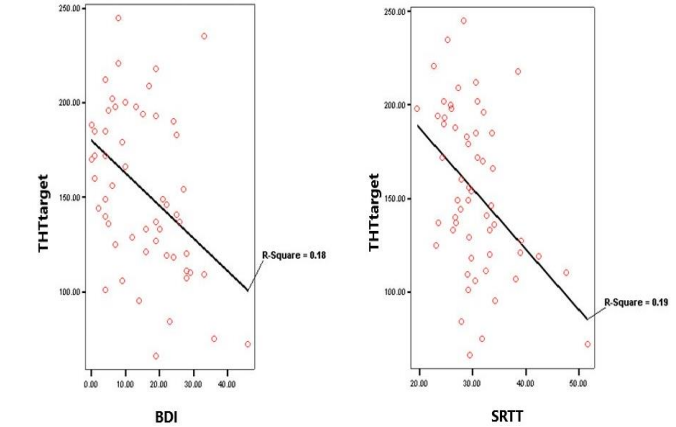
Table 2: The differences between the group in the THTperformance, THTtarget and THTerror values

	Group	Session	Segment
THTperform.	***P*=0.013**	***P*=0.003**	***P*<0.001**
THTtarget	*P*=0.070	***P*=0.001**	***P*<0.001**
THTerror	***P*=0.003**	***P*<0.001**	***P*<0.001**

THTperform: Target Hitting Test perform, THTtarget: Target Hitting Test target, THTerror: Target Hitting Test error

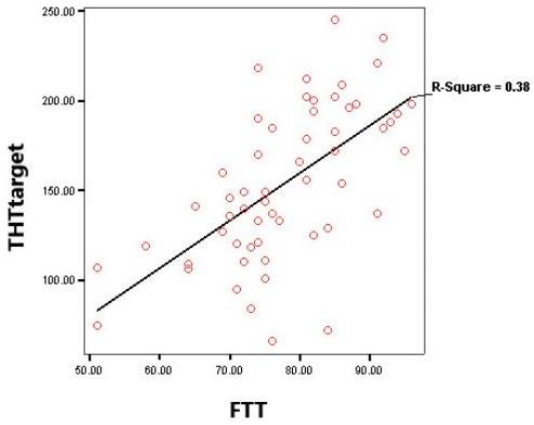
Although THT target values held steady between groups, factors such as the number of sessions and segments affected them (*P*=0.001 and *P*<0.01, respectively), resulting in increased values (Table 2). THT target values also decreased in line with rising BDI (THT1 target *P*=0.001, THT2 target *P*=0.001) and SRTT scores (THT1 target *P*<0.001, THT2 target *P*<0.001). In contrast, these values increased with higher FTT scores (THT1 target *P*<0.001, THT2 target *P*<0.001) (Figures 1 and 2).

Figure 1: The interactions between the THTtarget values and BDI, SRTT scores



THTtarget: Target Hitting Test target, BDI: Beck Depression Inventory, SRTT: Serial Reaction Time Task

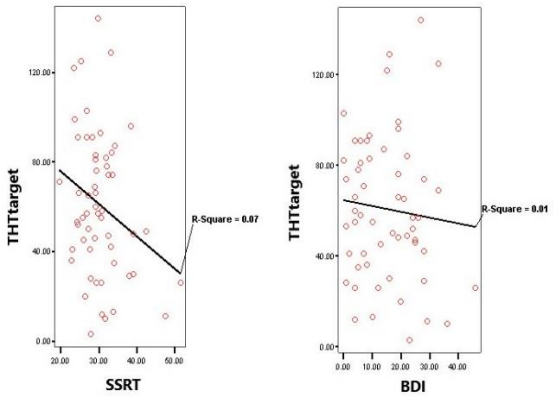
Figure 2: The interaction between the THTtarget values and FTT scores



THTtarget: Target Hitting Test target, FTT: Finger Tapping Test

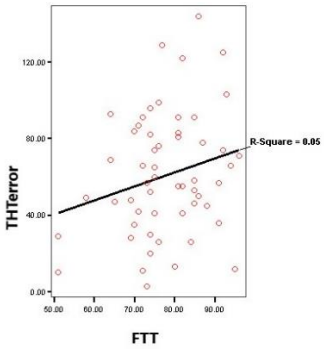
Notably, a significant interaction was identified between THT error scores and BDI (*P*=0.024), FTT (THT1 error *P*=0.033, THT2 error *P*=0.020), and SRTT scores. Concretely, THT1 error was inversely related to SRTT scores (r=-0.390, *P*=0.040). This implies that as THT1 error increases, SRTT scores decrease, and vice versa (Figures 3 and 4).

Figure 3: The interactions between the THTerror values and BDI, SRTT scores



THTtarget: Target Hitting Test target, SRTT: Serial Reaction Time Task, BDI: Beck Depression Inventory

Figure 4: The interactions between the THTerror values and FTT scores



THTerror: Target Hitting Test error, FTT: Finger Tapping Test

Discussion

The current study's findings indicate a considerable decline in fine motor skills among individuals with MDD. In comparison to the control group, the MDD participants performed poorly on all three computerized tests associated with fine motor skills (SRTT, FTT, THT). The deficient performance of the MDD group in the THT test was particularly influenced by high THT error scores.

This result suggests that patients may have overexerted their motor performance in an attempt to reach the target. In other words, they seemed to compensate for the situation with physical effort rather than employing the cognitive strategies

required by the test. It can be asserted that the execution and coordination of fine motor skills, involving the synchronized efforts of small muscle groups, are closely intertwined with cognitive processes. One can consider actions such as speaking, painting, writing, manipulating objects, physical gestures, and facial expressions, which provide insights into mental processes as expressive functions, and they constitute one of the subcomponents of cognitive functions [16]. The decline in neurotransmitter systems, particularly the dopaminergic system, and regression in fine motor movements appear to correlate with age-related cognitive deficits. This can serve as evidence supporting the involvement of cognitive processes [17]. The literature suggests that the neocerebellum and dorsolateral prefrontal cortex are concurrently activated during both motor and cognitive tasks, highlighting the interconnectedness of motor and cognitive development [18].

Many studies, like this one, have found that depression can impair both cognitive and motor performance in patients, resulting in a decline in fine motor skills [8,19–21].

Pier and his colleagues [8] studied the elements of psychomotor slowing in depressed patients versus healthy individuals. They assigned participants a Fitts task and a figure replication task. The results showed that onset and motion times were considerably longer for those with depression compared to those without. Although the onset time for intricate figures was extended in both sets, it was particularly notable in the depressed group. Additionally, depressed patients made a significantly higher number of mistakes with complex figures. The researchers concluded that psychomotor slowing in depression is due to both cognitive and motor processing disruptions, with cognitive issues becoming more evident in the depressed group when task difficulty increases.

In another study conducted by Beheydt et al. [19], participants were administered line drawing and symbol copying tasks in addition to symbol-number matching tasks. The initiation time was defined as the duration between the presentation of the stimulus and the commencement of the first drawing movement. The findings indicated that the patient group exhibited slower performance in both cognitive and psychomotor tasks, with this difference becoming more evident as the cognitive load increased.

In their study, Bezzi et al. [20] employed the Bjerner reaction time test to gauge motor speed. Participants were instructed to move the device's arm up and down in response to an audio stimulus. The authors found that patients with depression took longer to execute the task, showcasing a longer reaction time, and missed more commands, indicating fewer movements.

Mastoras et al. [21] investigated the relationship between depressive tendencies and psychomotor performance. They employed a smartphone application to assess participants' typing proficiency across various applications. Data, including keystrokes, initiation of typing, completion of typing, deletions, and so forth, were recorded. The study revealed a significant correlation between typing performance and scores on the depression scale.

Some research indicates that cognitive impairment is the primary cause of delayed development in fine motor skills [5]. Hoffstaedter et al. [5] examined cognitive and motor functions in patients with depression and healthy volunteers. They employed various tests, including trail-making tests A and B, a motor coordination test, the Wechsler Adult Intelligence Scale, a multiple-choice vocabulary intelligence test, and a tripartite reaction time test (encompassing simple, serial choice, and reactive variations). The study revealed that depressed patients performed significantly slower in most tests compared to healthy volunteers. However, there was no significant difference in the fine motor skills test (FTT) outcomes.

Limitations

Our study comprised 56 participants: 28 patients and 28 healthy volunteers aged from 18 to 45, all of whom hold at least a high school diploma due to the demanding nature of the assigned tasks. The narrow age and educational range likely contributed to our small sample size. Furthermore, our sample had approximately three times as many female subjects as male, bottlenecking our study's scope.

Conclusion

This study found that patients with MDD show a notable decline in fine motor skills linked to a decrease in cognitive functions. However, patients tend to quickly adjust to this deceleration. Often, impairments in fine motor movements, particularly psychomotor retardation, may be overlooked during clinical follow-ups. This oversight can negatively impact the patients' quality of life and their adherence to treatment. Therefore, clinicians should address this issue more attentively. The study concludes that the reduction in MDD patients' fine motor skills relates to both motor and cognitive processes. These insights can contribute to devising better strategies for MDD treatment and management. Yet, the generalizability of these results warrants caution, necessitating further research to reaffirm and broaden these insights.

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Instagram and Achilles tendon surgery: Evaluation of patients' perceptions of surgery

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Ethics Committee Approval
This article is not a study with human participants. There are no experiments on animals. This article does not contain any studies on human participants or animals performed by the author. There is no identifying information of participants.

Conflict of Interest
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Abstract

Background/Aim: The primary objective of this study was to conduct comprehensive research and analysis of patient-generated content related to Achilles tendon surgery on the social media platform Instagram. The aim was to gain deeper insights into patients' experiences during the perioperative period, which may contain valuable information pertinent to their condition, information of which the physicians may be unaware.

Methods: A search was conducted on the Instagram database, covering a period of 78 months from February 2015 to August 2021. Posts utilizing the hashtags "#achillessurgery" and "#achillesrepair" were included in the analysis. Posts were assessed using a binary scoring system, considering variables such as tone, media format, return to work, rehabilitation or physical therapy, return to sports, images related to the ankle (e.g., scars, stitches, casts, dressings, walking boots), activities of daily living, and pain.

Results: A total of 500 posts were reviewed, and a positive tone was observed in 77.8% of these. The average Instagram like ratio for these posts was computed as 9%. Statistical analysis revealed a significant relationship between post content and tone status (P=0.001). Specifically, within the positive tone group, informative content about the disease was comparatively lower and statistically significant when compared to exercise training and patient experience (P=0.001). Additionally, exercise training posts were found to be significantly lower than patient experience posts (P=0.001) within the positive tone group. In contrast, within the negative tone group, patient experience posts were significantly higher compared to informative content and exercise training posts (P=0.001). Moreover, the quantity of informative posts markedly surpassed the number of posts related to exercise training (P=0.001).

Conclusion: In the positive tone category, people tended to emphasize personal experiences and participate in posts related to exercise training rather than actively seeking or exchanging information about the disorder. On the other hand, within the negative tone group, individuals were more likely to share adverse experiences, pursue support, and seek a deeper understanding from others. Their priority may also lie in sharing and gaining information specifically about the disorder. Our exploration of the use of social media platforms to delve into patient perspectives on Achilles tendon surgery provides an alternative insight into patients' experiences with the surgical process. By comprehending the content shared by patients on social media, surgeons may gain an improved opportunity to assess and address the surgical experience of their patients more effectively, ultimately contributing to enhanced patient care.

Keywords: Achilles, hashtag, post, return to sports, Instagram like ratio

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Introduction

Social media platforms, including Facebook, Twitter, and Instagram have emerged as pervasive channels for social interaction, attracting a considerable number of users on a daily basis. Within this communication network, individuals suffering from health issues avail themselves of the opportunity to engage in discussions regarding their medical conditions [1,2]. The emergence of social media has played a crucial role in facilitating improved communication between patients and healthcare professionals [3,4].

Instagram, a social networking application with a user base exceeding 250 million active daily users, functions as a platform for the distribution of varied visual content in the form of photographs and videos [5]. Since 2011, Instagram has empowered its users to conduct searches using hashtags (#), thereby simplifying the exploration of users and posts that align with similar interests or themes [5,6]. In the context of orthopedic surgeries, Instagram serves as a communication tool that facilitates interaction among patients, hospitals, and physicians, thereby promoting mutual benefits for all stakeholders involved [7].

The aim of this study was to explore and analyze content related to Achilles tendon surgery posted by patients on Instagram. Our goal was to acquire insight into patients' experiences during the perioperative period, which might hold significance for them but remain undisclosed to physicians. We anticipate that the results of this study, along with future research efforts, will contribute to improving healthcare quality by enhancing the surgeon-patient relationship.

Materials and methods

This research covered a duration of 78 months, commencing on February 15, 2015, and concluding on August 17, 2021. Throughout this period, posts labeled with the hashtags “#achillessurgery” and “#achillesrepair” were queried within Instagram's database. The search terms were documented, along with the corresponding number of posts associated with the aforementioned hashtags. Subsequently, two independent researchers cataloged and analyzed the search results. In instances where discrepancies arose between the reviewers, a consensus was reached through joint examination of the media. Posts that continued to elicit disagreement were excluded from the study. As the submissions were already publicly accessible, no personally identifiable information was redacted, and thus, no approval from an ethics committee was sought.

The study included all posts written in English, containing the hashtags “#achillessurgery” and “#achillesrepair”, featuring human subjects. The majority of posts primarily focused on Achilles tendinopathy and, consequently, were excluded from the analysis. Additionally, patients who did not undergo Achilles surgery, accounts featuring rehabilitation or physical therapy advertisements, accounts belonging to physicians, and accounts related to health and veterinary topics, were also excluded.

The primary outcome variables derived from the analysis of the posts, were assessed using a binary scoring system. These variables included the media format (video or photo), the tone (positive or negative), the timing of post sharing relative to the surgery (before or after), references to return to work (RTW) and return to sports (RTS), mentions of rehabilitation or physical therapy, references to ankle-related images (such as scars, dressings, stitches, casts, or walking boots), pain, magnetic resonance images (MRI), and references to activities of daily living (ADL). Additionally, the timing of post sharing during the perioperative period was categorized into groups based on whether the posts were shared within one week before or after surgery or on the first anniversary of surgery.

The shared content was additionally categorized into groups, including exercise training, informative content about the condition, patients' experiences, and surgical techniques.

For each post that included the hashtags “#achillessurgery” and “#achillesrepair,” the "Instagram like ratio" was computed by dividing the number of likes by the total number of followers (likes * 100 / [likes + dislikes]). The average Instagram like ratio was then determined based on these calculations. [8].

Statistical analysis

The Number Cruncher Statistical System (NCSS) 2007 program for statistical analysis (Kaysville, Utah, USA) was used in the investigation

Data distribution and the application of data restriction methods, such as standard deviation, mean, median, frequency, minimum, ratio, and maximum were assessed, ensuring the integrity of the study data. The Shapiro-Wilk test was used to evaluate the data distribution. In cases involving the comparison of three or more groups of quantitative variables, the Kruskal-Wallis test was employed, while the Mann-Whitney U-test was used for pairwise comparisons between two groups. To determine the relationship between qualitative variables, chi-square analysis criteria were applied. The significance level was set at $P<0.01$ and $P<0.05$.

Results

This study aimed to assess and analyze 500 public posts on Instagram using the hashtags #achillessurgery and #achillesrepair over a 78-month period, specifically from February 15, 2015, to August 17, 2021. The average monthly post count for Achilles surgery was 6.4. All posts were included in the analysis, as there were no discrepancies among the reviewers. Of the 500 posts reviewed, 67% consisted of photographs, while 33% were videos. Notably, 79.2% of the posts were shared by female patients. Posts with a positive tone constituted 77.8% of the total.

Regarding the timing of the posts, 78.6% were found to be shared after the surgery, while 21.4% were posted before the surgery. Concerning the perioperative period, 84.2% of the posts were shared within one week before or after the surgery. Among these, 21.4% were shared less than one week before the surgery, and 62.8% were shared within one week after the surgery. Additionally, 15.8% of the posts were shared on the first anniversary of the surgery.

Approximately half of the patients discussed ADL in their social media posts (25.6%), and 20.4% of the posts included images of the ankle. RTS was also frequently mentioned (20.2%). Other relevant comments in the posts

referred to pain (15.8%), MRI (9.6%), RTW (4.4%), and PT (4%).

Regarding the categorization of the post contents, 79.2% of the posts were related to patients' experiences, while 10.6% contained informative content about the condition, and 10.2% focused on exercise education (Table 1).

The average Instagram like ratio for posts featuring the hashtags #achillessurgery and #achillesrepair was calculated at 9%. However, upon considering the content of the posts, the Instagram like ratio did not exhibit a statistically significant difference (*P*=0.116) (Table 2).

Table 1: Patient analysis of 500 posts from #achillessurgery and #achillesrepair search on Instagram

		n	%
Gender	Female	396	79.2
	Male	104	20.8
Timing of Post	<1 wk before surgery	107	21.4
	<1 wk after surgery	314	62.8
	1st year anniversary of surgery	79	15.8
Type of media	Photographic media	336	67
	Video media	164	33
Post Content	Education of exercise	51	10.2
	Informative content of disease	53	10.6
	Patient experience	396	79.2
Tone	Positive	389	77.8
	Negative	111	22.2
Media reference	RTS	101	20.2
	RTW	22	4.4
	ADL	128	25.6
	PT	20	4
	Images of ankle	102	20.4
	Pain	79	15.8
	MRI	48	9.6

n: Number, RTS: Return to sports, RTW: Return to work, ADL: Activities of daily living, PT: Physical Therapy, MRI: Magnetic Resonance Imaging

Table 2: Comparing Instagram like ratio by post content

		n	Mean (SD)	Min-Max (Median)	*P*-value
Instagram Like Ratio	Education of exercise	51	0.09 (0.1)	0.01-0.6 (0.05)	0.116
	Informative content of disease	53	0.08 (0.15)	0.01-0.6 (0.03)	
	Patient experience	396	0.1 (0.13)	0-0.6 (0.04)	

Kruskall Wallis Testi **P*<0.05 ***P*<0.01, n: Number, SD: Standard deviation, Min: Minimum, Max: Maximum

A statistically significant relationship was found between the post content and gender (*P*=0.042). Specifically, in the female group, the number of posts containing informative content was significantly higher than those related to exercise training (*P*=0.001).

The study findings revealed several statistically significant relationships between the content of the posts and other variables. Firstly, there was a significant relationship between the content of the post and the timing of the post (*P*=0.001). In the group of posts shared one week before the surgery, the number of posts related to exercise education was lower compared to posts about patient experience and informative content (*P*=0.001). On the other hand, for posts shared on the first year anniversary of the surgery, the number of exercise education posts was higher compared to informative content about the condition and lower than patient experience posts (*P*=0.001).

Furthermore, there was a statistically significant relationship between the content of the post and the tone status (*P*=0.001). In the positive tone group, informative content about the disorder was significantly lower compared to exercise training and patient experience posts (*P*=0.001). Exercise training posts were also significantly lower compared to patient experience posts (*P*=0.001). In the negative tone group, patient experience posts were significantly higher compared to informative content about the Achilles surgery and exercise training posts (*P*=0.001). Additionally, the number of informative content posts about the condition was significantly higher compared to the number of exercise training posts (*P*=0.001).

Lastly, a statistically significant relationship was found between the post content category and media reference (*P*=0.001). In the group of posts related to a return to sports (RTS), the number of exercise education videos was significantly higher compared to patient experience and informative content videos (*P*=0.001). In the activities of daily living (ADL) group, the number of exercise education videos was significantly lower compared to patient experience videos (*P*=0.001). Similarly, in the images of ankle group, the number of exercise education videos was significantly lower compared to informative content videos and patient experience (*P*=0.001). In the pain group, the number of exercise education videos was significantly lower compared to informative content videos and patient experience (*P*=0.001). Lastly, in the MRI group, the number of exercise education videos was significantly lower compared to informative content videos about the condition (*P*=0.001) (Table 3).

Discussion

This observational study conducted on social media revealed that patients undergoing Achilles tendon surgery extensively discussed topics such as scar appearance, ankle images, return to sports (RTS), activities of daily living (ADL), and pain in their posts. Given that 25.6% of the posts were related to ADL, it can be argued that patients perceive this as a primary criterion for assessing the success of Achilles tendon surgery. Furthermore, with 20.2% of the posts regarding Achilles tendon surgery mentioning ADL, it can be inferred that this criterion holds significant importance for patients when evaluating the outcome of their surgical procedure.

Activities of daily living encompass the routine tasks individuals perform in their daily lives, such as walking, climbing stairs, dressing, and personal hygiene. The restoration of functionality and independence in performing these activities is often a paramount goal for patients in their recovery from Achilles tendon surgery. Therefore, a substantial focus on ADL within posts or discussions related to Achilles tendon surgery suggests that patients attach significance to their ability to resume and execute these daily activities without limitations or difficulties. Hence, the successful restoration of functional abilities is likely considered a primary criterion when evaluating the overall success of Achilles tendon surgery.

In the context of Achilles tendon surgery, a statistically significant relationship exists between the content of posts and gender. Specifically, females exhibited a higher number of informative posts about the condition compared to exercise training posts.

These findings indicate disparities in the types of posts shared by males and females concerning Achilles tendon surgery. The greater number of informative posts about the disorder observed within the female group suggests an increased focus on comprehending and disseminating information related to the condition itself, encompassing its etiology, symptoms,

Table 3: Relationship between post content and the other variables

		Type of post content			*P*-value
		Education of exercise	Informative content about the disease	Patient experience	
Gender	Female	35a (8.8%)	47b (11.9%)	314a, b (79.3%)	0.042*
	Male	16a (15.4%)	6b (5.8%)	82a, b (78.8%)	
Timing of Post	<1 week before surgery	1a (0.9%)	17b (15.9%)	89b (83.2%)	0.001**
	>1 week after surgery	30a (9.6%)	30a (9.6%)	254a (80.9%)	
	1st year anniversary of surgery	20a (25.3%)	6b (7.6%)	53b (67.1%)	
Tone	Positive	50a (12.9%)	32b (8.2%)	307c (78.9%)	0.001**
	Negative	1a (0.9%)	21b (18.9%)	89c (80.2%)	
Media reference	RTS	39a (38.6%)	7b (6.9%)	55b (54.5%)	
	RTW	5a (22.7%)	0a (0%)	17a (77.3%)	
	ADL	5a (3.9%)	9a, b (7%)	114b (89.1%)	
	PT	0a (0%)	3a (15%)	17a (85%)	
	Images of ankle	2a	14b (13.7%)	86b (84.3%)	
	Pain	0a (0%)	11b (13.9%)	68b (86.1%)	
	MRI	0a (0%)	9b (18.8%)	39a, b (81.3%)	

Chi-Square Testi **P<0.01, RTS: Return to sports, RTW: Return to work, ADL: Activities of daily living, PT: Physical Therapy, MRI: Magnetic Resonance Imaging

treatment options, and potential outcomes. Conversely, the lower number of exercise training posts in the female group implies that females may exhibit less inclination to share or seek advice specifically concerning exercise training during the recovery process.

While 77.8% of the Instagram posts included in this study displayed a positive tone, previous analyses of social media platforms have shown percentages ranging from 87% to 93% of patients expressing a positive tone following procedures such as arthroplasty, anterior cruciate ligament reconstruction, and shoulder-elbow surgeries. [9–11]. In their social media study, Haeberle et al. [12] reported a lower rate of positive tone (53%) in their investigation of patients undergoing hip arthroscopy, attributing it to the postoperative recovery protocol. In contrast, the patients in the present study generally displayed an optimistic attitude when discussing the rehabilitation process following Achilles tendon surgery. However, it was observed that ankle movements were seldom mentioned in the posts, suggesting a potential lack of emphasis on ankle joint range of motion by the post originators.

The findings of this study revealed that the majority of posts (62.8%) were shared within the first week after the surgery, while a smaller proportion (15.8%) were shared on the first year anniversary of the surgery. The decrease in the number of posts during the preoperative period, which is known to be traumatic and painful, suggests that individuals may be less active in posting content during this challenging phase. It is not uncommon for individuals to seek support and advice and share their experiences during the early stages of recovery, which are characterized by heightened pain, discomfort, and uncertainty. Therefore, the higher percentage of posts during the first postoperative week could be attributed to the need for support and information during this crucial and potentially traumatic period.

Conversely, the lower percentage of posts at the first year anniversary of surgery may indicate that patients have progressed further in their recovery and may feel more confident and self-reliant. As time passes and the healing process continues, individuals may require less frequent support or feel less inclined to share their experiences online.

The observation that individuals post less frequently during the preoperative period aligns with the understanding that this period can be emotionally and physically challenging, leading to reduced online activity. The anticipation of surgery, accompanied by pain, limitations, and concerns about the procedure and its outcomes, likely contribute to the decreased frequency of posts during this phase.

In the group "first year anniversary of surgery," it was found to be statistically significant that the number of "education of exercise" posts was higher compared to "informative content of disease" posts, but lower compared to "patient experience" posts. This suggests that during the first year after surgery, patients may be more inclined to share or seek information about exercise education as part of their ongoing recovery journey. However, their focus may still be primarily on sharing their personal experiences and insights gained throughout the process.

These findings highlight the temporal variations in post content related to Achilles tendon surgery. Patients' concerns, priorities, and information needs may evolve at different stages, from the preoperative period to the first year anniversary of the surgery. It is important to consider these temporal dynamics when analyzing online discussions and providing support to patients undergoing Achilles tendon surgery.

In the positive tone group, it was found to be statistically significant that the number of informative posts about the condition was lower compared to exercise training and patient experience posts. Additionally, it was found to be statistically significant that exercise training posts were lower compared to patient experience posts. This suggests that in the positive tone group, individuals may focus more on sharing their personal experiences and engaging in exercise training discussions rather than seeking or sharing information about the disorder itself.

In the negative tone group, it was found to be statistically significant that patient experience posts were higher compared to informative posts and exercise training posts. Furthermore, the number of informative posts about the condition was higher compared to exercise training posts. This indicates that in the negative tone group, individuals may be more inclined to share their negative experiences and seek support or understanding from others. They may also prioritize sharing and acquiring information about the surgery itself.

These findings highlight the differences in post content based on the tone status of the posts in relation to Achilles tendon surgery. Positive tone posts may be more focused on personal experiences and exercise training, while negative tone posts may center around sharing negative experiences and seeking support or information about the disorder.

In the RTS group, it was found to be statistically significant that the number of exercise education videos was significantly higher compared to informative content videos and

patient experience. This suggests that individuals in the RTS group may be more interested in sharing and accessing exercise education materials to support their journey of returning to sports activities.

In the ADL group, it was found to be statistically significant that the number of exercise education videos was significantly lower compared to patient experience videos. This indicates that individuals in the ADL group may prioritize sharing their personal experiences related to daily activities rather than focusing on exercise education.

In the incision site group, the number of exercise education videos was found to be significantly lower compared to informative content videos about the condition and patient experience. Similarly, in the pain group, the number of exercise education videos was significantly lower compared to informative content videos and patient experience. These findings suggest that individuals in these groups may be more inclined to discuss or seek information about the condition and their personal experiences rather than focusing on exercise education.

In the MRI group, the number of exercise education videos was found to be significantly lower compared to informative content videos about the disorder. This indicates that individuals in the MRI group may prioritize sharing or seeking information about the condition itself rather than focusing on exercise education.

These findings highlight the variations in post content category and media references across different groups within the context of Achilles tendon surgery. The preferences and priorities of individuals can differ depending on their specific circumstances, such as their goals (e.g., returning to sports, improving daily activities), concerns (e.g., incision site, pain), or the diagnostic procedures they have undergone (e.g., MRI). Further research and analysis would be needed to understand the underlying reasons for these differences and their implications.

The quantity of followers and likes is often considered a significant metric for assessing the perceived value of individuals or companies. Instagram users typically strive to augment their follower count and accumulate likes in order to create a favorable impression [13]. According to classical understanding, having a substantial number of followers and likes on social media enhances the effectiveness of a post and triggers the phenomenon known as "social proof." Social proof refers to the psychological tendency for individuals to assume that what is popular or endorsed by a majority of people is deemed valuable or credible. When a post has a high number of followers and likes, it creates the perception that the content is of high quality or worth following [14].

In contemporary times, there is an assumption that Instagram users gauge the credibility of a post based on its likes/follower ratio. It has been established that in credible accounts, one post for every 1,000 followers typically receives an average of 30 to 140 likes, representing a percentage range of 3% to 14% [13,15]. When the likes/follower ratio significantly exceeds or falls below these established rates, the content is generally perceived as generating distrust among users [13]. In our study, the mean Instagram like ratio was 9%, a value that falls within the safe limits as indicated by previous studies.

Limitations

Our study encountered certain limitations. The evaluation was restricted to publicly accessible posts, limiting the sample size to 500. Nevertheless, it is crucial to acknowledge that 500 posts from individuals who underwent Achilles surgery hold significance. Furthermore, social media users may have the tendency to present themselves in a more positive light than in reality, potentially leading to an overestimation of positive tones. The specific details regarding the surgical technique employed remain unknown. Additionally, the variability among surgeons, inherent in the study design, may influence the results.

Conclusion

In the positive tone category, people tended to emphasize personal experiences and participate in posts related to exercise training rather than actively seeking or exchanging information about the condition. On the other hand, within the negative tone group, individuals were more likely to share adverse experiences, seek support, and seek a deeper understanding from others. Their priority may also lie in sharing and gaining information specifically about the disorder.

Amid the ongoing transition towards patient-centered care models, there is an increasing acknowledgment of the importance of investigating and analyzing patients' perceptions of their health. These insights provide valuable feedback for healthcare practitioners within the healthcare system. Traditionally, evaluations have depended on standardized and stereotypical questions. However, our study on the utilization of social media regarding Achilles tendon surgery presents an alternative perspective on patients' sentiments and experiences throughout their surgical journey. By comprehending the content shared by patients on social media platforms, there is a potential opportunity to enhance the evaluation of patients' surgical experiences, thereby enabling surgeons to improve their management and care approaches. This approach acknowledges the importance of patient perspectives and seeks to leverage them for better patient outcomes.

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The effect of early mobilization on constipation after abdominal surgery: A systematic review

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Abstract

Background/Aim: Constipation can occur after abdominal procedures. In this study, we investigated whether early mobilization after abdominal surgery is effective for treating constipation.

Methods: We conducted a systematic review of studies implementing early and planned mobilization after abdominal surgical procedures. We extracted studies published from 2012–2022 from six electronic databases: PubMed, Google Scholar, Science Direct, Cochrane, TürkMedline, and Ulakbim. The data were collected by two reviewers following a pre-designed subtraction form. We made use of narrative synthesis when presenting our results.

Results: We examined 10 articles that satisfied the inclusion criteria; patients underwent a cesarean section in four studies, bariatric surgery (gastric bypass) in one study, liver resection in one study, radical cystectomy in two studies, cholecystectomy in one study, and a kidney transplant in one study. The studies were characterized by differences in the early mobilization programs applied to patients after abdominal surgery. In two of the studies, the patients were mobilized accordingly to daily step goals; in five studies only early stimulation and walking attempts were utilized. In three of the studies, the patients were mobilized within the scope of mobilization programs prepared in detail after surgery, and the targets were determined in terms of distance walked. All of the studies stipulated that physical activity should gradually increase over time.

Conclusion: Early and planned mobilization programs applied after surgery had positive effects on first gas/first stool output time, the severity of abdominal distension, the occurrence of nausea/vomiting, and the onset of oral intake.

Keywords: abdominal surgery, early mobilization, planned mobilization, constipation

Introduction

Abdominal surgical interventions, which refer to operations performed on organs within the abdominal region, are surgical interventions in which major or minor complications are still occasionally observed despite technological and methodological advances [1]. Causes for abdominal surgery includes diseases of the stomach, gallbladder, liver, spleen, pancreas, small intestine, and large intestine [2]. Some problems observed after abdominal surgery are related to the gastrointestinal system [3-5]. Constipation is an abnormal condition in which the stool is hard and dry; voiding is furthermore infrequent and defecation may be difficult [6,7]. In the early postoperative period, rest, opioid/nonopioid analgesic drugs and the necessity of using slide/duck can all cause constipation [8]. Constipation can negatively affect quality of life and cause discomfort, and treating this issue is important in terms of truly individualizing care [6,9-11].

Early mobilization is important for rapid recovery and is one of the most effective methods for early initiation of bowel movements [12]. Patients may experience limited mobilization, however, due to pain, nausea, dizziness, fatigue, surgical complications, continued intravenous fluid intake, and the use of auxiliary equipment such as urinary catheters during the postoperative period [13-16]. Early mobilization is considered to be one of the cornerstones of Enhanced Recovery After Surgery (ERAS) protocols, and it is recommended after abdominal interventions [13,17]. According to ERAS protocols, patients should engage in activities from bed for at least two hours on the day of surgery and at least six hours per day until discharge [12,13]. Early mobilization studies in the literature have focused on the time of first mobilization, frequency, application protocol, the use of different measurement tools for evaluating mobilization (e.g., a pedometer or wearable technologies for determining walking distance in meters). It is recommended that patients receive a patient-specific care plan that defines daily targets for mobilization; patients should furthermore create a diary recording their out-of-bed activities [12]. Early mobilization practices and correct nutrition during the perioperative period can slow down the catabolic process that accelerates after surgery, reduce the risk of surgery-related stress response and ileus, and accelerate recovery [18]. Engaging in physical activity not long after abdominal surgical interventions is important to reduce recovery time and costs [19]. Studies have demonstrated that mobilization in surgical patients is an unmonitored nursing intervention [20,21]; patient follow-up is also a basic nursing intervention to increase mobility after surgical interventions [22].

This systematic review sheds light on information about the effects of early and planned mobilization conducted after abdominal surgical interventions and its effect on constipation.

Materials and methods

Research strategy

This systematic review was based on specific databases (PubMed, Google Scholar, Science Direct, Cochrane, TürkMedline, and Ulakbim) queried using the keywords "abdominal surgery", “early mobilization and surgery”, “early mobilization and constipation”, “early mobilization and initial flatus”, and “early mobilization and ileus and constipation”. The last search was conducted on September 22, 2022. We tabulated a total of 5,550 studies (2,000 from PubMed, 403 from Google Scholar, 1,180 from ScienceDirect, 1,167 from Cochrane, 390 from TürkMedline, and 410 from Ulakbim). Duplicate articles were identified (n=470) and excluded. The titles and abstracts of the remaining studies (n=5,080) were reviewed by the researchers and evaluated for compliance with the criteria determined within the scope of the study. We isolated 10 studies for inclusion in this systematic review. We made use of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) checklist tool to review the literature and summarize and report our results [36].

Inclusion criteria

Randomized controlled, experimental, and quasi-experimental design-type studies correlated with full-text articles published between 2012 and 2022 in Turkish and/or English were included.

Exclusion criteria

Review studies, retrospective and observational studies, studies involving intensive care units and pediatric patients, and articles and dissertations defined as gray literature, were not included. In addition, studies in which multiple ERAS protocols were used in abdominal surgery procedures were not included because they did not evaluate the effect of early mobilization practices alone.

Results

Eight of the studies satisfying the inclusion criteria were randomized controlled experiments, and two were of quasi-experimental control group research design.

The patients underwent a cesarean section in four studies, bariatric surgery (gastric bypass) in one study, liver resection in one study, radical cystectomy in two studies, cholecystectomy in one study, and a kidney transplant in one study. The investigations reported different early mobilization programs. In two of the studies, the patients were mobilized on the basis of daily step goals; in five of the studies, the patients only received early physical stimulation and opportunities to walk. In three of the studies, patients were mobilized within the scope of the mobilization programs prepared in detail after surgery, and the targets were determined to be distance walked. All of the studies gradually increased physical activity over time (Table 1).

In addition to constipation, early mobilization, the development of diarrhea, pain severity, fatigue, time of first bowel movements and sounds, length of hospital stay, walking distance, time spent sleeping, the incidence of a mother holding a baby after birth, rates of complications, quality of life, vital signs, wound healing time, and patient satisfaction were also tabulated.

The investigations revealed that the first gas and stool output times of the patients who woke up early after surgery were significantly shorter than the corresponding times of patients not woken up early after surgery. Furthermore, gastrointestinal motility and bowel sounds returned in a significantly shorter amount of time in the intervention-group

Table 1: Summary of the studies included in the systematic review

Authors and year of publication	Title of the research	The design type of the research and the number of samples	Measurement tool(s) used	Research protocol	Results and conclusion
Zhu et al. 2021 [43]	Early mobilization intervention for patient rehabilitation after renal transplantation	Randomized controlled study Intervention=35 Control=35	Data are patient identification forms and the patients' activity diaries	An FTS-based early mobilization intervention was applied to the study group. Patients were allowed to turn in their own bed on postoperative day 1, and they practiced sitting up in bed on the 2nd postoperative day and performed rehabilitation exercises in bed with the help of postoperative nursing staff. On the 3rd postoperative day, the patients were allowed to do activities at their bedside. Changes in the vital signs of the patients were closely monitored.	The duration of bowel sounds, first gas and defecation were found to be significantly different in the study group compared with the control group (P<0.05).
Aldemir and Sayılan 2020 [37]	Effect of a mobilization program administered after open cholecystectomy on sleep duration and several other clinical variables	Experimental control study Study group=32 Control group=32	The data are from patient information forms, postoperative follow-up chart entries, a visual comparison scale, and pedometer printouts.	The patients in both groups were moved from their bed at the 7th hour postoperatively. Patients in the experimental group moved a total distance of 250–500 meters on the 1st postoperative day, 500–1500 meters on the 2nd postoperative day, and 1500–3500 meters on the 3rd postoperative day. The specified distance was divided into five time periods, and the patients were asked to walk with a pedometer. The control group was informed that they should carry a pedometer on the 1st, 2nd, and 3rd postoperative days. However, unlike the experimental group, patients in the control group did not receive any walking distance recommendations from the research nurse.	The first gas and stool outputs of the patients in the study group were earlier than those of the control group, and the walking distances of the patients in the study group were furthermore significantly longer (P<0.05).
Barai and Vahitha 2019 [35]	Effectiveness Of Early Ambulatıon On Post-Operatıve Recovery Among Prımıparous Post Cesarean Mothers-A Randomızed Control Trıal	Randomized controlled study Intervention=62 Control=62	- Numerical rating scale -Structured observation chart -Survey form -Mobilization hours and distance records	Patients in the intervention group were awakened 6 hours after their operation and were mobilized three times a day at 6-hour intervals for the first five days. Mobilization durations were increased day by day. Patients in the control group were mobilized after 18 hours according to a routine procedure. At the end of every 24 hours, the patients were evaluated for their first gassing.	There was a significant difference between the first gas output times of the patients in the intervention and control groups after surgery (P<0.05).
Herman et al. 2019 [40]	The Effect of Early Mobilization on Intestinal Peristaltics in Patients after a Cesarean Section in Kendari City Hospital	Quasi-experimental controlled study Study group=36 Control group=36	- Patients' activity diaries, Daily exercise	Patients were divided into two groups: 36 patients in the early mobilization group and 36 patients in the control group. The mobilization group started with leg exercises 4 hours after cesarean section. Standard treatment was initiated 10 hours after cesarean section in the control group.	In the early mobilization group, there was a significant improvement in intestinal peristalsis.
Hassan et al. 2019 [39]	Effect of Three Different Nursing Interventions on Intestinal Motility and Women's Satisfaction Post-Cesarean Section Birth	Randomized controlled trial Intervention 1=60 Intervention 2= 60 Intervention 3= 60 Control=60	Structured interview questionnaire -Numbered rating scale -Stethoscopic abdominal assessment -Visual analog scale -Patient satisfaction	The patients were divided into four groups (three intervention groups and one control group). Surgical patients in the early mobilization group were mobilized from the 4th hour after cesarean section, and they were allowed to walk at least 5–10 meters three times per day. Patients in the control group were mobilized 8 hours after surgery. The patients were evaluated in terms of postoperative nausea/vomiting, abdominal distension, bowel movements, gas and stool output every 2 hours for the first 2 hours and every 2 hours thereafter.	Early mobilized patients exhibited significantly shorter first gas output times compared with patients in the control group (P<0.05); early mobilized patients also exhibited shorter first stool exit times (but this difference was not significant).
Wiklund et al. 2015 [19]	Physical Activity in the Immediate Postoperative Phase in Patients Undergoing Roux-en-Y Gastric Bypass-a Randomized Controlled Trial	Randomized controlled trial Intervention=30 Control=25	-Pedometer -Patients' activity diaries -Postoperative recovery questionnaire -Patients in the intervention group provided daily step goals -Assessments of the step targets of patients in the intervention group	Before the study, all patients were informed about the importance of postoperative mobility. Patients in the intervention group mobilized in line with their daily step targets using a pedometer. All of the patients recorded the time they spent lying down, sleeping, walking, sitting, passing gas/stool, and the number of days they stayed in the hospital.	Despite the fact that there was no significant difference between the time of first gas and stool output between the groups (P>0.05), the patients in the intervention group exhibited shorter times to first gas and stool output. Planned and targeted mobilization practice increases the number of steps taken after surgery and facilitates mobilization.
Sahin and Terzioğlu 2015 [32]	The Effect of Gum Chewing, Early Oral Hydration, and Early Mobilization on Intestinal Motility After Cesarean Birth	Randomized controlled trial 240 participants, 7 intervention groups and 1 control group for a total of 8 groups; 30 patients in each group	-Patient information form -Gastrointestinal mobility assessment	The patients in the control group were mobilized at the 8th hour postoperatively in line with routine practices; the patients in the early mobilization group were mobilized at the 4th hour postoperatively when their vital signs were stable after being seated at the bedside for 10 minutes. Patients in the intervention group walked 5–10 meters three times per day.	It was determined that the first gas discharge time, the first intestinal motility onset time and the first gas transit time of the patients in the group in which all interventions including early mobilization were applied occurred significantly earlier than the control group (P<0.05). As a result of the study. It has been reported that early mobilization, chewing gum, and transition to early oral feeding are important interventions to shorten the hospital stay and reduce the risk of postoperative ileus development.
Ni et al. 2018 [33]	Early enforced mobilization after liver resection: A prospective randomized controlled trial	Randomized controlled trial Intervention=60 Control=60	Fitbit Flex smart wristband -Patient information form	Patients in the control group were told to only do in-bed exercises for 1–2 days after surgery and to stand by their bed on the 3rd postoperative day. Gradual mobilization was then introduced. The patients in the intervention group and their families were informed about early mobilization during the preoperative period, and their mobilization was performed when their vital signs and general conditions were stable after surgery. In-bed extremity exercises were performed on the 0th postoperative day for between 20 and 40 minutes each hour for the patients in the intervention group. On the 1st postoperative day, the patients were given breathing and coughing exercises in a semi-sitting position. Active-passive exercises were continued, and they were allowed to sit on their bed 2–3 times during the day and hang their feet. On the 2nd postoperative day, the catheter and drainage tubes of the patients were removed, and they were allowed to walk 2–3 times a day for a total of 250–500 meters. On the 3rd postoperative day, the patients were allowed to walk a total of 1500–3000 meters and to stand up more than 5 times per day. Evaluations were made at appropriate times according to the condition of each patient, and the amount of activity was determined according to the patient's needs.	The duration of nausea and vomiting and the first gas and stool output times of the patients in the intervention group were found to be significantly shorter (P<0.05). It was determined that the patients in the intervention group took a shorter time to experience abdominal distension than the control group, although this difference was not significant (P>0.05).
Dube and Kshirsagar 2014 [38]	Effect of Planned Early Recommended Ambulation Technique on Selected Post caesarean Biophysiological Health Parameters	Semi-experimental control group study Intervention=250 Control=250	Structured observation chart -Biophysiological parameters -Visual analog scale	Patients in the intervention group were given respiratory, coughing and leg exercises to perform 5–6 hours after their operation. Patients were asked to mobilize three times per day, at 3–4-hour intervals, over the first five days following surgery. Patients in the control group got out of bed and conducted leg exercises on the 3rd postoperative day. All of the patients were evaluated in terms of intestinal motility, abdominal distension, breast status, biophysiological parameters, and incisional pain for the first five days following surgery.	Compared with patients in the control group, the patients in the intervention group exhibited a significant decrease in peristaltic activity (P<0.05), abdominal distension and tenderness. Early planned mobilization can accelerate recovery after cesarean section.
Jensen et al. 2014 [41]	Multidisciplinary rehabilitation can impact on health-related quality of life outcome in radical cystectomy: secondary reported outcome of a randomized controlled trial	Randomized controlled trial Intervention=50 Control=57	-Patient information form -EORTC Quality of Life Core Questionnaire 30 (QLQ-C30) -Preoperative and postoperative EORTC BLS24 (bladder symptom-specific) EORTC BLM30 (14–17 days before surgery EORTC QLQC30 + EORTC BLS24; 4 months after surgery EORTC QLQC30 + EORTC BLM30) - one day before discharge EORTC INPATSAT- 32 inpatient satisfaction survey -Katz Scale -Charlson Comorbidity Index -Nutrition Risk Screening-2002 -Mobilization in determining hours and walking distance (meters) by clinical staff and patients -Recorded activity logs -Bristol scale -Visual analog scale	The same ERAS was applied to patients in the intervention and control groups. Two weeks after surgery, patients in the intervention group started an exercise program. Patients in the control group received a standard mobilization procedure and were evaluated only once a day by a physiotherapist. All patients provided assessments at various time points, and all patients maintained a mobilization log detailing pain and nausea severity. Patients received follow-up phone calls after being discharged.	There was no significant difference in the incidence of nausea and vomiting between the groups (P=0.36); patients in the intervention group exhibited less-developed abdominal distention and constipation (P=0.05 and P=0.02, respectively).

patients. Postoperative constipation and abdominal distention and abdominal tenderness were also reduced in surgical patients who were mobilized early, and the rates of postoperative nausea and vomiting also dropped. Additionally, oral intake was achieved in a shorter amount of time in those patients

Discussion

Mobilization interventions after abdominal surgery accelerate gastrointestinal motility, promote normalization of bowel functions, and reduce the severity of abdominal distention [1,23]. Data from the studies that we reviewed support the viewpoint that postoperative mobilization programs are effective interventions that can reduce the constipation experienced by patients.

One of the most common symptoms of gastrointestinal motility following abdominal surgery is postoperative constipation [24,25]; postoperative mobilization programs should aim to provide prompt relief for constipation. It has been reported that postoperative applications given to abdominal surgery patients shorten the period of first swelling in early and planned mobilization programs [26-29]. The results of the studies that we reviewed emphasize that although mobilization programs applied after abdominal surgical interventions differ in their structure, they often have a positive effect on bloating and defecation time. Studies have also reported a decrease in the rate of development of ileus and other complications that are observed in the gastrointestinal tracts of patients who undergo abdominal surgery and planned mobilization programs after surgery [30,31]. The studies in this systematic review showed that early and planned mobilization programs shorted the first stool exit times of patients after abdominal surgery [19,29,32,33]. These applications accelerate the process by which the gastrointestinal tract returns to normal. One of the primary symptoms of ileus that can develop after surgery is an inability to tolerate oral intake [24,25]. Sindell et al. [26] examined the effect of early mobilization on the onset of oral intake after abdominal surgery and found that the time to initial oral intake was shortened and that total oral intake increased during the postoperative period in patients who were early or excessively mobilized [27,28,34]. However, this effect was evaluated in only one of the studies included in this systematic review [35]. That investigation found that early and planned mobilization can boost gastrointestinal motility and enable oral intake to be tolerated relatively rapidly after surgery.

Conclusion

Early and planned mobilization practices have positive effects on the prevention of constipation-related complications. However, there is a need for additional well-designed randomized controlled studies that evaluate the effectiveness of mobilization programs in more research settings and in different patient groups.

International standards regarding early mobilization programs should also be established; such programs could be adapted according to the type of surgical intervention and the individual characteristics of the patient.

In the literature, it has been seen that the effects of early mobilization practices on constipation results after cesarean section have been tried to be determined. However, postoperative gastrointestinal system functionality is also very important, especially in bariatric surgery patients who have undergone colorectal surgery and are now widely practiced. In addition to the initial gas/fecal discharge time, the frequency of defecation, the amount of oral intake, the severity of nausea-vomiting, and abdominal distension are important nursing interventions for patients to return to their pre-operative regularities in the gastrointestinal tract after surgical intervention. However, it is noteworthy that studies generally try to determine the time of first gas/fecal output after surgery and other factors have been examined in a limited number of studies.

International standards regarding early mobilization programs should also be established; such programs could be adapted according to the type of surgical intervention and the individual characteristics of the patient.

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Case report
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A case with Gianotti-Crosti syndrome with a history of atopic dermatitis

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Informed Consent
The authors stated that the written consent was obtained from the parents of the patient presented with images in the study.

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Abstract

Gianotti-Crosti syndrome (GCS) is characterized by the sudden onset of a papular or papulovesicular rash with a symmetrical distribution. This rash mainly appears on the extensor surfaces of the limbs, buttocks, and face. GCS is most frequently observed in children aged 1 to 6 years. In this case, we present the diagnosis of GCS in an 8-month-old male patient who also has a history of atopic dermatitis. Symmetrical, multiple, monomorphic, raised, red, and itchy lesions were identified on the patient's face, trunk, arms, and legs. The presence of atopic dermatitis was notably more common in individuals with GCS, suggesting a significant association with a family history of atopy. GCS is a syndrome that demands a high degree of clinical suspicion as it can be mistaken for other childhood exanthematous diseases.

Keywords: Gianotti-Crosti syndrome, atopic dermatitis

Introduction

Gianotti-Crosti syndrome (GCS), also known as papular acrodermatitis, childhood papular acrodermatitis, or infantile papular acrodermatitis, is characterized by the sudden onset of a papular or papulovesicular rash with a symmetrical distribution. This rash primarily appears on the extensor surfaces of the extremities, buttocks, and face [1]. GCS is most commonly observed in children aged 1 to 6 years [1,2].

The two most common pathogens associated with GCS are Epstein-Barr virus (EBV) and hepatitis B, although many different viral infections have been reported in association with this syndrome, including cytomegalovirus (CMV), HIV, hepatitis A, hepatitis C, parvovirus B19, parainfluenza virus types 1 and 2, coxsackieviruses A16, B4, and B15, rotavirus, echovirus, respiratory syncytial virus, rubella virus, adenovirus, enterovirus, herpes virus 6, molluscum contagiosum virus, paravaccinia virus, and mumps virus [1,2].

In this report, we present the case of an 8-month-old male patient with a history of atopic dermatitis who has been diagnosed with GCS.

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Case presentation

An 8-month-old male patient presented with a papular eruption that rapidly worsened over the course of a few days. The papules initially appeared on the legs and subsequently spread to the trunk, arms, and face. The patient had experienced flu-like symptoms approximately one week prior to the eruption. There was no history of fever, vomiting, diarrhea, recent vaccination, or a family history of COVID-19. Additionally, the patient had a history of using hydrocortisone acetate due to a prior diagnosis of atopic dermatitis, although there were no recent skin lesions related to this condition.

Upon physical examination, we observed symmetrical, multiple, monomorphic, raised, erythematous, and pruritic lesions on the face, trunk, arms, and legs (Figure 1). Notably, there were no lesions on the scalp, mucous membranes, palms, or soles. The individual lesions had diameters ranging from 1 to 5 mm. Laboratory tests, including a complete blood count and respiratory viral panel, returned normal results. Serology for hepatitis A, B, C, herpes 1-2, cytomegalovirus (CMV), and EBV all yielded negative results.

Figure 1: Multiple monomorphic, fat-covered, erythematous pruritic papules lesions.

The patient had previously been evaluated at another medical center, where a diagnosis of atopic dermatitis had been established, and moisturizing cream had been recommended. Following subsequent evaluations by various specialties, including pediatrics and dermatology, the diagnosis of GCS was considered the most likely based on clinical findings and laboratory examinations. As a measure for controlling pruritus, an antihistamine was prescribed. The rash spontaneously resolved within a 15-day period.

The patient's mother provided written consent for the publication of this report and the use of accompanying pictures.

Discussion

GCS, also known as papular acrodermatitis, is a self-limiting condition primarily affecting children under the age of 6, although it is less common in adolescents and adults. It is characterized by a viral exanthem, typically manifesting as flat-topped, symmetrically distributed papular lesions that predominantly affect the extremities, gluteal region, and extensor surfaces. While GCS is often associated with viral infections, it can also be linked to bacterial infections, vaccination, or occur idiopathically [1,3].

Given the benign and self-limiting nature of GCS, the primary focus should be on symptomatic and supportive measures. For pruritus management, some sources recommend the use of topical lotions (such as calamine, pramoxine, menthol, camphor, and polidocanol) as well as oral antihistamines. In severe cases, topical or systemic corticosteroids may be indicated [3].

In the differential diagnosis of GCS, other conditions to consider include atopic dermatitis, hand-foot-and-mouth disease, papular urticaria, fifth disease, erythema multiforme, scabies, and drug eruptions [1]. Notably, atopic dermatitis, a common chronic inflammatory skin disease characterized by itching, dry skin, eczematous lesions, and lichenification, should be considered in the differential diagnosis [4]. It is worth mentioning that most children with GCS have an excellent prognosis, but full recovery may take some time until the lesions completely resolve, often causing concern for both the patient and their family [3].

As with other differential diagnoses, differences should be considered when distinguishing GCS from atopic dermatitis. Notably, the presence of atopic dermatitis was found to be significantly higher in individuals with GCS, suggesting a strong association with a family history of atopy. Research has indicated that atopy plays a significant role in predisposing children to clinical papular eruptions characteristic of GCS when exposed to various microbial agents [5]. The fact that our case had a history of atopy aligns with these findings.

Conclusion

Diagnosing GCS requires a high degree of clinical suspicion, as it can be easily confused with other childhood exanthematous diseases. This condition may be underdiagnosed and should, therefore, be considered in the differential diagnosis of patients presenting with atypical exanthema.

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