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We are proud to successfully publish the third issue of Journal of Comprehensive Surgery (JOCS). There are two original articles and 3 interesting case reports in this issue. We are getting closer to our scientific goals every day. In the near future, we want to contribute to the international literature on behalf of our country by entering valuable international indexes. We would like to thank all the authors who contributed to the publication of the issue by sending their articles to our journal and everyone who contributed at every stage.

Sincerely

Prof. Dr. Mehmet ÇITIRIK

Editor

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The effectiveness of modified stone recurrence predictive score in predicting recurrence of urinary stone disease

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ABSTRACT

Aims: The present study is intended to define the scoring system consisting of questions to be answered by the patients in an outpatient clinic setting in order to predict recurrence of urinary system stone disease.

Methods: Two hundred patients who were admitted for urinary system stone treatment in our clinic between 2016 and 2017 were included in the study. A Modified Stone Recurrence Predictive Score (MSRPS) comprising 23 questions under 14 headings including risk factors such as age, gender, smoking and alcohol consumption, family history of stone, number of stones, additional diseases and medications, presence of urinary tract infection, dietary characteristics, stress factors, occupation, and obesity was created. Three-year follow-up data of all patients were recorded.

Results: The mean MSRPS was 18.4 ± 6.2 (6-35). We noted that the high Modified Stone Recurrence Predictive Score correlated significantly with the incidence of recurrent stone formation ($p < 0.001$ r^2 : 0.923). When the cutoff value was considered as 18, the sensitivity was 89.4% and the specificity was 93.1% in predicting recurrent stones. Recurrent stone formation was observed within 3 years in all patients with an MSRPS value of 26 and above.

Conclusion: Thanks to this scoring system developed by expanding the scope of similar studies conducted in previous years, the possibility of recurrence of urinary stone disease is predicted using a questionnaire that can be filled easily, and it would be an appropriate choice regarding both patient health and cost-effectiveness in terms of directing patients to metabolic analyses or recommending preventive measures.

Keywords: Urolithiasis, recurrence, nomogram, predictive

INTRODUCTION

The lifetime risk of developing stones in the urinary system is 12% in men and 6% in women.^{1,2} As the prevalence increases, the cost allocated to urinary stone disease treatment and the loss of workforce during the diagnosis and treatment process constitute the socioeconomic dimension of the problem.³ Furthermore, urinary stones tend to recur even if they have been completely treated. The risk of recurrence within the first year is 10.5%, 35% in 5 years and approximately 50% in 10 years.⁴

Urinary system disease is multifactorial; age, gender, daily water consumption, smoking and alcohol use, family history of kidney stones, number of stones, gouty arthritis, drug use, urinary tract infections, excessive salt and protein consumption in the diet, living in hot climates, presence of stress, obesity, menopause and giving birth are among the risk factors for both urinary stone formation and recurrence.⁵⁻¹⁴

Shock Wave Lithotripsy and new generation technology-dependent surgical procedures have facilitated the treatment of urinary stones.^{15,16} However, treatment costs per patient are increasing due to technology dependence.³ This indicates that

medical solutions and preventive medicine should come to the fore.^{17,18} Being able to predict the likelihood of recurrence will help us in metabolic evaluation and planning medical treatment of patients.

There are studies evaluating the possibility of recurrence using some of the risk factors accounted to be involved in kidney stone formation. In a study conducted by Lee et al.¹⁹ an 8-question questionnaire was used and it was found to be reliable in predicting stone recurrences. The recurrence of kidney stone (ROKS) nomogram was introduced in 2014 and was updated in 2018 and is now being used to predict recurrence.^{20,21} In our study, a questionnaire consisting of 23 questions under 14 main headings was created. This questionnaire was applicable to men and women and also included the 8 questions used in the survey study conducted by Lee et al.¹⁹ Therefore, by modifying the scoring system mentioned above, it was aimed to create a score for each factor based on the responses, to increase the scope and sensitivity of the scoring system, and to predict the recurrence of renal stone disease more precisely by determining a cutoff value.

METHODS

Two hundred patients aged 18 years and over, who were treated for the first time with the diagnosis of urinary system stone disease and who voluntarily agreed to participate in the study during their follow-up between January 2016 and December 2017, were included in the study. Approval was obtained from the Kırıkkale University Medical Faculty Clinical Researches Ethics Committee Ethics Committee for this thesis study (Date: 21.05.2019, Decision No: 10/03). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Non-contrast contrast tomography (NCCT) scans of all patients were evaluated before treatment. Appropriate treatment methods (PCNL, ESWL, URS) were administered for urinary stones. All post-treatment data of the patients were evaluated by a single urologist. Patients were asked to attend their routine follow-ups annually and to come without waiting for this period if renal colic occurred, and they were discharged after treatment.

First of all, the eight questions from the Stone Recurrence Predictive Score (SRPS) were used exactly as they are. In addition to these questions, risk factors associated with the risk of renal stone formation in the literature that can be inquired with simple questions were included in the new scoring system. Thus, the Modified Stone Recurrence Predictive Score (MSRPS) consisting of 23 parameters under 14 main headings was created (See [Appendix](#)). When the patients came for the follow-ups, the same urologist administered the survey by asking questions to the patient.

Patients were evaluated in terms of recurrence with NCCT scan during the follow-up. Recurrence criteria were as follows: 1. Newly formed stone detected by NCCT, 2. Passage of a stone that was not detected before, 3. Growth exceeding 2 mm in residual stone size.

Hence, the annual recurrence rates of the patients were obtained and recorded in their files. The follow-up period was 3 years.

The scores of the questionnaires were attained using the results of the linear regression test and standardized coefficients.

Statistical Analysis

Statistical analysis was performed by entering the study data into a commercial statistics program on a personal computer. Normality analysis was evaluated by the t test and chi-square test. The correlation of recurrence with the questions used in the questionnaire and the resulting score was evaluated by applying linear regression and logistic regression tests. The correlation between MSRPS and recurrence was evaluated by using Pearson's correlation analysis. Statistical significance was considered at $p < 0.05$. Results are presented as the mean $\pm$ SD.

RESULTS

Of the 200 patients included in our study, 62 were female and 138 were male. The mean age was 45.2 ± 14.5 (18-78). The mean age was 44.7 ± 16.9 (18-78) in women and 45.5 ± 13.3 (22-76) in men.

Recurrence was observed in 89 (44.5%) of 200 patients included in the study after 3 years of follow-up. When the

APPENDIX: MSRPS

1. Age	
30-50	2
Other	0
2. Sex	
Male	2
Female	0
3. Smoking	
Heavy smoker	2
Occasioanlly	1
Nil	0
4. Alcohol	
Usually	2
Occasioanlly	1
Nil	0
5. Family History	
Both parents	4
Mother	3
Father	2
Brothers or sister	1
Nil	0
6. Stone Number	
Multiple and bilateral	4
Multiple and unilateral	2
Single and bilateral	1
Single and unilateral	0
7. Gouty Arthritis Story	
Yes	3
Nil	0
8. Additional Disease	
Chronic bowel disease	2
Hyperthyroidism	1
Hyperparathyroidism	3
Diabetes Mellitus	1
9. Medication	
Use of antiacid agent	1
Use of glucocorticoid	1
Use of loop diuretic agent	1
Use of calcium agent	2
Use of vitamin D	1
10. Urinary Tract Infection	
Yes	2
Nil	0
11. Diet	
Excess protein in the diet	2
Excess salt in the protein	2
12. Job	
Desk work	1
Mobilise	0
13. Stress	
Low income-in debt	2
Nil	0
14. Obesity	
BMI >25	2
BMI <25	0
Abbreviations: MSRPS: Modified Stone Recurrence Predictive Score, BMI: Body Mass Index (kg/m ²)	

distribution of these recurrences by years was evaluated, it was noted that 31 of them (15.5%) occurred in the first year. Recurrence was seen in 38 patients (19%) in the second year, and in 20 patients (10%) in the third year.

Linear regression test performed on all components of our scoring model revealed that the number of stones ($p=0.001$) and obesity ($p=0.002$) were found to be significantly correlated with the presence of recurrence. It was found that the other components did not have a statistical significance on their own.

The average scores of the models are; MSRPS: 18.4 ± 6.2 (6-35). In the linear regression test, a positive correlation was found between the MSRPS and the presence of recurrence ($Y: 0.235 + 0.078 X$, $r^2: 0.923$, $p < 0.001$). Pearson correlation test indicated a positive correlation ($p < 0.001$) between the MSRPS score and annual recurrence scores.

According to the ROC analysis performed to determine the power of MSRPS in predicting recurrence, the value in the area under the curve is 0.870. ROC curve of these parameters are given in [Figure](#).

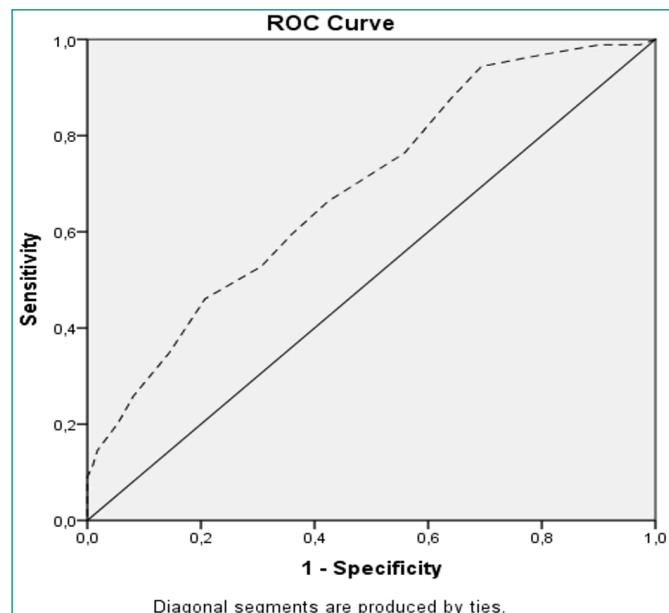


Figure. ROC curves for Modified Stone Recurrence Predictive Score model

When the MSRPS cutoff value was taken as 18, the sensitivity was 89.4% and the specificity was 93.1 percent. When the cutoff value was taken as 26, the specificity was 100 percent. When binary logistic analysis was performed over a cutoff value of 18, recurrence developed in only 5 out of 39 patients predicted to have no recurrence, while recurrence was detected in 84 out of 161 patients predicted to have recurrence.

DISCUSSION

Negatively affecting the health and quality of life of individuals, urinary stone disease is a common medical problem throughout the world and has an important impact on health expenditures.²² Therefore, it has been shown that preventive medicine studies can positively affect the financial burden of urinary stone disease.

The lack of a definitive medical treatment for the disease and the widespread and successful application of surgical procedures cause the medical treatment part of the solution to be neglected.^{8,9} Especially, most of the patients who suffer from first stone attack go into a noncomprehensive evaluation and therefore, preventive treatment is recommended for very few of them.

In countries where urinary stone disease is common, the rate of having a stone disease at least once in a lifetime varies between 12 and 15 percent.²² Furthermore, recurrence can be seen in a patient who has had a stone disease once. Recurrence rates have been reported as 10% annually, 50% in 10 years, and 98% in 25 years.^{23,24}

If the patients at risk can be predicted among those who have had stone disease at least once, we can get a chance to recommend metabolic evaluation and preventive treatment to forestall new stone formation.²⁵ Unfortunately, almost 95% of clinicians are not aware of nomograms prepared for this purpose.²¹

While there are simple applicable scoring methods that can be used to predict stone recurrence, they are not sufficient. Although this deficiency was emphasized in the study introducing the SRPS system in 2003, the insufficiencies of this study, such as the fact that it did not question the risk factors for stone formation, which are frequently discussed

in the literature, and that it did not include these risk factors in scoring created a gap in this area.¹⁹ It is still promising that the aforementioned study suggested possible prediction of stone disease above the cutoff value determined in the study. When the cutoff value was taken as 7, the sensitivity was 61.7% and specificity was 75.3% in the detection of stone recurrence; however, when this value was considered as 11 or above, the specificity was 100% and it was emphasized that it would be beneficial to introduce preventive methods.

The ROKS nomogram, introduced in 2014 and updated in 2018, also provides valuable information on kidney stone recurrence.^{20,21} This nomogram, which was created the data collected from follow-ups of 2239 patients between 1984 and 2003 until 2012, contains 13 questions.²⁰ According to the responses given, it determines the risk as percentage in the 2nd, 5th and 10th years. However, its insufficiency in predicting the risk of reoperation, the lack of stone composition and its limited use in genetic diseases constitute its main drawbacks.²¹

Hoping to fill the gap in the nomogram to some extent, we diversified the questions by addressing other risk factors in the literature, aiming to improve the work of Lee et al.¹⁹ which we considered as a reference. Therefore, an MSRPS consisting of 23 questions was created. It was observed that the MSRPS system created during the analyzes were all correlated with the stone recurrence rates.

When the cutoff value was taken as 18 in the MSRPS system, the sensitivity was 89.4% and specificity was 93.1 percent. Therefore, we were able to predict the majority of recurrence patients while keeping false negative values at very low rates. If the cutoff value was 26 and above, the specificity was found as 100%.

The restricted length of the follow-up period in terms of recurrence and the relatively scarce number of patients are the limitations of our study. For this reason, in order to better evaluate the effectiveness of the scoring system and to decide on the elimination of some of the existing parameters or the change of their scoring, we continue the study with longer-term follow-up of the patients and in larger study groups.

CONCLUSION

This study has shown that MSRPS is a simple and reliable method that can be administered wherever there is pen and paper. Due to the high probability of recurrence in renal stone disease, it would be beneficial to make a metabolic evaluation if the MSRPS is 18 or above, and to recommend preventive measures if it is 26 or above.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Kırıkkale University Medical Faculty Clinical Researches Ethics Committee Ethics Committee (Date: 21.05.2019, Decision No: 10/03).

Informed Consent: All patients understood the treatment and aim of the study. The written informed consents were obtained. All patients signed and free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

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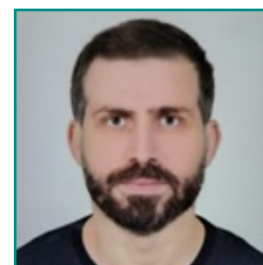
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Can inflammatory markers predict intestinal wall ischemia in sigmoid volvulus?

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ABSTRACT

Aims: Sigmoid volvulus (SV), which causes closed-loop obstruction as a result of the rotation of the sigmoid colon around its mesentery, causes serious morbidity and mortality, especially in elderly patients, when necrosis develops in the intestine. In this study, it was investigated whether inflammatory markers, which guide the diagnosis and prognosis of many intra-abdominal pathologies, can predict the presence of ischemia in the intestine in patients with SV.

Methods: In the study, patients who were operated on for SV in our clinic between January 2019 and March 2022 were retrospectively screened, and the demographic, clinicopathological, and laboratory parameters of the patients were examined. Data were analyzed with the Student's T test and Mann-Whitney U-test.

Results: Of the 47 patients included in the study, 28 (59.6%) were male and 19 (40.4%) were female. Intestinal necrosis was detected in 23 (48.9%) patients who underwent surgery. The mean age of the patient population was 70 (± 19). There was no statistical difference between the two groups according to age ($p=0.338$). White blood cell count (WBC) ($p=0.686$); Neutrophil count ($p=0.949$); Lymphocyte count ($p=0.790$); Monocyte count ($p=0.898$); Neutrophil-lymphocyte ratio (NLR) ($p=0.733$); Platelet count ($p=0.766$); RDW value ($p=0.725$); There was no statistically significant difference between the two groups in lactate level ($p=0.289$), C-reactive protein (CRP) ($p=0.212$), Amylase ($p=0.975$) and Lactate dehydrogenase (LDH) ($p=0.974$) levels.

Conclusion: Detection of intestinal necrosis is a vital condition for the patient. Inflammatory biomarkers obtained from preoperative routine blood parameters were not found to be significant in estimating the presence of intestinal necrosis in the SV clinic. It was concluded that large series are needed in this regard.

Keywords: Sigmoid, volvulus, ischemia

INTRODUCTION

Colonic volvulus is the rotation of a redundant segment of the colon around its mesentery, which causes obstruction in the volvulus developing segment and proximal and may cause ischemia, necrosis, and perforation in the colon due to impaired blood flow.¹ The sigmoid volvulus (SV) was first described by von Rokitsansky.² SV is one of the three most common causes of acute colonic obstruction and accounts for 50-90% of all colonic volvulus.³ SV, which is more common in men; Africa, Asia, the Middle East, South American countries, and Turkey are endemic areas, and the incidence for the US population is 0.001% per year.⁴

Although intestinal vascularization and necrosis can be evaluated with Ultrasonography, angiography, and Scintigraphy, it has been reported that intestinal viability can be demonstrated by endoscopic examination.⁵ Lower intestinal gastrointestinal endoscopy is recommended to evaluate sigmoid colon viability, detorsion, and decompress

the colon in hemodynamically stable patients without evidence of peritonitis or perforation.¹ If necrosis or perforation has developed in the wall of the abdomen, if there are signs of generalized peritonitis in the abdomen, if there is an early recurrence after unsuccessful endoscopic detorsion or detorsion, emergency surgery is indicated in these patients.⁶ Intestinal necrosis develops in 6.1-93.4% of SV cases, which is a catastrophic complication that doubles mortality.⁷ In this study, it was aimed to investigate the effectiveness of inflammatory markers, which are included in the diagnostic algorithm of many intra-abdominal pathologies, in predicting intestinal wall necrosis in patients diagnosed with SV.

METHODS

Patients

This study was conducted in Ankara City Hospital between January 2019 and March 2022, after the approval

of Ankara City Hospital No:1 Clinical Researches Ethics Committee (Date: 12.01.2022, Decision No: E1-22-2275). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

The patients who were operated on for SV between the two groups were screened retrospectively, and demographic, clinico-pathological, and laboratory parameters of the patients were obtained from electronic records. The data of 47 patients older than 18 years of age who were operated on with the diagnosis of SV, whose electronic records were accessed, was analyzed. Patients who were admitted to the emergency room with the diagnosis of SV and underwent colon resection by planning an emergency surgical intervention due to the presence of acute abdominal symptoms were included in the study. Patients who did not have radiological findings of acute abdomen, generalized peritonitis, colonic perforation, or full-thickness necrosis in the colon wall at the time of admission to the emergency department, patients who underwent endoscopic detorsion, patients under the age of 18, patients with any malignancy, and patients using immunosuppressive drugs were not included in the study. Resection materials were examined by expert pathologists. Patients were divided into two groups according to the presence (Group A) or absence (Group B) of pathological necrosis in the postoperative histopathological examination of the resection material.

Materials

The age and gender of the patients, hemogram taken at the first admission to the hospital, biochemical parameters, and venous blood samples were examined, and the results of the study were obtained from these sample analyses. White blood cell count (WBC) (reference range: 440-11300/uL), neutrophil count (reference range: 110-9600 uL), lymphocyte count (reference range: 500-6000 uL), monocyte count (reference range: 100-1400 uL), RDW value (reference range: 11.5-16%), neutrophil-lymphocyte ratio (NLR), and platelet count (reference range: 150.000-500.000/uL), C-reactive protein (CRP) (reference range: 0.15-5 mg/dl), amylase (reference range: 30-118 U/L), lactate dehydrogenase (LDH) (reference range: 120-246 U/L), and venous blood gas Lactate level (reference range: 4.5-20 mmol/L) was recorded.

Statistical Analysis

Statistical Analysis Statistical analyses were performed using the IBM Statistical Package for the Social Sciences version 26 (IBM SPSS Corp.; Armonk, NY, USA). The compliance of numerical data with a normal distribution was checked with the Kolmogorov-Smirnov test. It was determined that the WBC, Lymphocyte, Monocyte, Platelet, lactate, and RDW values of the variables showed normal distributions, while the others did not show normal distribution. Among these variables, the median (quarter percent) values for the non-parametric distributions and the mean ($\pm$ Standard Deviation) values for the parametric distributions were given (Table 1). Continuous variables were analyzed with the Student's T test and the Mann-Whitney U-test. $p < 0.05$ was considered statistically significant.

RESULTS

Of the 47 patients included in the study, 28 (59.6%) were male and 19 (40.4%) were female. The mean age of the patient

population was 70 (± 19). The mean age of 23 patients in Group A was 73, and the mean age of 24 patients in Group B was 66. There was no statistically significant difference between the two groups according to age ($p = 0.530$). While mortality developed in 5 (21%) patients in Group A, Mortality developed in 4 (16%) patients in Group B. WBC ($p = 0.714$); Neutrophil count ($p = 0.798$); Lymphocyte count ($p = 0.282$); Monocyte count ($p = 0.633$); Platelet count ($p = 0.299$); RDW value ($p = 0.951$); NLR ($p = 0.625$); Lactate level ($p = 0.113$), CRP ($p = 0.134$), Amylase ($p = 0.774$) and LDH ($p = 0.783$) levels were not statistically significantly different between the two groups (Table 2).

Table 1. Clinical and demographic data of the patients

	N	
Age	47	76 (56-85)**
Neutrophil count	47	7.93 (5.6-9.6)**
NLR	47	6.87 (3.8-12.2)**
LDH	46	256 (213-309)**
Amylase	47	48 (34-75)**
CRP	32	18 (3-56)**
WBC	47	10.47 (± 4.13)*
Lymphocyte count	47	1.19 (± 0.58)*
Monocyte count	47	0.53 (± 0.25)*
Platelet count	47	279 (± 89)*
RDW	47	14.7 (± 1.5)*
Lactate	30	2.01 (± 1.09)*

Notes: Parametric variables are given as mean ($\pm$ standard deviation) * if they are normally distributed and as median (quarter percent) ** if they are not normally distributed.
Abbreviations: NLR, neutrophil-to-lymphocyte ratio; LDH, lactate dehydrogenase; CRP, C-reactive protein; WBC, white blood cell count.

Table 2. Continuous variables and categorical data

	Group		p
Age	Group A Group B	78 (55-82)** 73 (57-85)**	0.530
Neutrophil count	Group A Group B	8.32 (5.6-9.4)** 7.78 (5.5-12.1)**	0.798
NLR	Group A Group B	6.68 (3.9-12.2)** 8.38 (3.8-12.8)**	0.625
LDH	Group A Group B	254 (214-276)** 262 (209-321)**	0.783
Amylase	Group A Group B	49 (31-94)** 47 (43-67)**	0.774
CRP	Group A Group B	35 (11-64)** 11 (3-43)**	0.134
WBC	Group A Group B	10.2 (± 3.8)* 10.6 (± 4.4)*	0.530
Lymphocyte count	Group A Group B	1.2 (± 0.6)* 1.1 (± 0.5)*	0.282
Monocyte count	Group A Group B	0.5 (± 0.2)* 0.5 (± 0.2)*	0.633
Platelet count	Group A Group B	292 (± 86)* 265 (± 92)*	0.299
RDW	Group A Group B	14.8 (± 1.6)* 14.7 (± 1.4)*	0.951
Lactate	Group A Group B	2.3 (± 1.1)* 1.6 (± 0.9)*	0.113

Notes: Parametric variables are given as mean ($\pm$ standard deviation) * if they are normally distributed and as median (quarter percent) ** if they are not normally distributed.
Abbreviations: NLR, neutrophil-to-lymphocyte ratio; LDH, lactate dehydrogenase; CRP, C-reactive protein; WBC, white blood cell count.

DISCUSSION

SV is one of the leading causes of large bowel obstruction worldwide. Both luminal obstruction and vascular occlusion, which develop due to the rotation of the sigmoid colon around its mesentery, are the causes of the pathophysiological changes and clinic in the SV. Loss of volume in the obstructive intestinal lumen in the SV leads to hypovolemia as well as mucosal ischemic damage; necrosis causes toxicity

by facilitating bacterial translocation and absorption of toxic products.⁸

The first step in SV diagnosis is visualization of the diagnosis, mainly by plain radiography and computed tomography. Colonoscopy is then usually performed to further confirm the diagnosis and, if possible, to try to detorsion the SV endoscopically.⁹ Colonoscopic detorsion is the first-line treatment if there is no evidence of peritonitis.¹⁰ It is difficult to determine the extent of mucosal ischemia/necrosis during endoscopy. A completely black mucosa defines full-thickness necrosis.¹¹ Emergency surgery is considered inevitable in this case.⁶ However, in borderline ischemia, the black mucosa contains different colors (yellow, reddish spots). In this situation, emergency surgery can be avoided with conservative treatment through close monitoring with intermittent colonoscopies (1-2 days), abdominal examinations (6-8 hours), and laboratory tests (twice a day) after detorsion.¹¹ When he sees signs of some ischemic changes in the sigmoid colon, he is concerned about the decision to follow the patient or have an emergency surgery.⁹ In our study, in such cases, inflammatory markers were found to be ineffective in guiding clinicians and supporting patients with intestinal necrosis without acute abdomen symptoms but with intestinal necrosis without wasting time with an invasive and morbid procedure such as colonoscopic detorsion.

Sigmoid necrosis develops in 6.1% to 93.4% of SV cases.¹² While 17-100% mortality develops, in this case, the mortality rate in the absence of necrosis is 3-30%.¹³ In our study, mortality was 21% in those with intestinal necrosis and 16% in those without necrosis, which was consistent with the literature.

In the current literature, intracellular enzymes, intracellular electrolytes, and inflammatory cells/markers; in addition to the increase in LDH and CRP, the reasons for the increase or decrease in the number of leukocytes are thought to be due to necrosis in the intestinal tissue and it is supported by studies. Khan et al.¹⁴ showed that hematological markers can be helpful in considering the diagnosis of acute mesenteric ischemia in emergency situations. With this, Bostancı et al.¹⁵ showed that preoperative elevation of NLR, Platelet-lymphocyte ratio (PLR), and systemic immune-inflammation index (SII) values in patients with incarcerated abdominal wall hernia may indicate intestinal ischemia and bowel resection ($p < 0.05$). Ceylan et al.¹⁶ In the study conducted by SV, they created a model that aims to predict whether there is intestinal necrosis in patients with SV only by blood tests. In the same study, they reported that leukocyte, CRP, and LDH values were risk factors for intestinal necrosis as a result of the analysis and that the probability of intestinal necrosis increased 10 times with values of 7 and above in the Malatya Volvulus Gangrene Model (MVGGM) they created. In addition, the enzymatic activity of LDH, which catalyzes the conversion of pyruvate to lactate, has been associated with intestinal ischemia in both experimental¹⁷ and human¹⁸ studies.

Contrary to the literature, in the analyzes performed on 47 patients in our study, no statistically significant difference was found between the groups with and without intestinal necrosis in WBC, Neutrophil count, Lymphocyte count, Monocyte count, Platelet count, RDW value, NLR, Lactate level, CRP, Amylase, and LDH values.

The important limitations of this study are the small number of cases included and the retrospective study.

CONCLUSION

Although inflammatory parameters were found to be significant in predicting bowel necrosis in the literature, it was concluded in this study that these parameters were not significant in predicting necrosis in patients with SV.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Ankara City Hospital No:1 Clinical Researches Ethics Committee (Date: 12.01.2022, Decision No: E1-22-2275).

Informed Consent: The written informed consents were obtained. All patients signed and free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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A successful falciparum malaria treatment with hemodiafiltration in an African patient

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ABSTRACT

Malaria is a serious infectious illness that has existed since ancient times. Despite its prevalence in Sub-Saharan Africa, it remains a global public health issue. However, *Plasmodium falciparum* causes the most severe and fatal form of malaria, accounting for almost 80% of global mortality. Malarial acute kidney injury (AKI) caused by malaria can progress rapidly. An early initiation to renal replacement therapy is advised because AKI induced by malaria may worsen fast. This paper report a successful severe malaria therapy with hemodiafiltration in the ICU of an African student studying in Turkey. The patient, whose blurring of consciousness increased and Glasgow coma scale (GCS) decreased GCS=8, was admitted to the anesthesiology and reanimation ICU. The patient was treated for 3 days with malaria medications and continuous renal replacement therapy (CRRT). Malaria persists everywhere, especially among nonimmunized people. AKI is common in malaria patients. Patients with severe malaria should be examined for renal involvement, including electrolyte abnormalities and fluid overload. Supportive treatment is recommended for oliguric AKI. If feasible, CRRT may help these patients.

Keywords: Malaria, *Plasmodium falciparum*, acute kidney injury, hemodiafiltration

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INTRODUCTION

Malaria is a serious infectious illness that has existed since ancient times. Over three million individuals in over 100 countries are infected with this parasitic illness, which causes over 400 thousand fatalities annually. Despite its prevalence in Sub-Saharan Africa, it remains a global public health issue.¹ *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium ovale*, *Plasmodium malariae*, and *Plasmodium knowlesi* are the five human parasites. However, *P. falciparum* produces the most severe and life-threatening type of malaria and is responsible for more than 80% of malaria deaths worldwide.² Mortality is linked to the degree of parasitaemia. Case fatality rates are higher in patients with high parasite densities. If the parasite count is greater than 10%, exchange transfusions may be helpful, as they eliminate parasitemia faster than optimum treatment alone.³ The diagnosis of malaria underlines the value of early diagnosis and treatment in easing patient suffering. The gold standard for diagnosing malaria is a peripheral blood smear.⁴ Although the pathophysiology of malarial acute kidney injury (AKI) is unknown, many pathways have been hypothesized. Hypotheses include hemodynamic (mechanical changes, immune-mediated glomerular damage, and metabolic changes).⁵ Fluid overload [pulmonary edema, heart failure], refractory electrolyte imbalances (hyperkalemia, metabolic acidosis), or symptomatic uremia may require specialist therapy such as dialysis. Malaria causes hypercatabolism

in these patients, increasing their requirement for dialysis. Because AKI caused by malaria can progress rapidly, it is recommended to start renal replacement treatment as soon as possible.⁶ We will present the successful severe malaria treatment that we applied with hemodiafiltration in the intensive care unit (ICU) of a university student who came to Turkey from Africa for education.

CASE

22-year-old man came to Turkey from the Republic of Guinea-Bissau, one of the West African countries, for university education. The patient, who applied to the emergency department due to confusion and fever, was hospitalized by the infectious diseases clinic. In his story, he stated he returned from his country three days ago and that his fever started while he was in his country. After examinations, the patient was diagnosed with *P. falciparum* malaria. The patient, whose blurring of consciousness increased and Glasgow coma scale (GCS) decreased GCS=8, was admitted to the anesthesiology and reanimation ICU. There was no acidosis in blood gas, but the pO₂ value was 62 mmHg despite high flow oxygen support. The patient whose blurred consciousness increased in the ICU follow-up was intubated and connected to a mechanical ventilator. It was determined that the patient had no urine output, and the

creatinine value increased from 1.3 to 4.1 within one day. Jaundice was observed in the conjunctiva, and the measured total bilirubin value was 23.28 mg/dl, of which 12.74 mg/dl was direct bilirubin. When hepatitis markers were examined, anti-HAV IgG was positive, and HBs Ag and anti-HCV were negative. Ultrasound imaging at the bedside revealed minimal hepatomegaly, and the bladder was empty.

Transfusion of 6 units of platelet suspension was applied to the patient whose platelet count decreased to 31.000. The patient's admission laboratory values are presented in [Table 1](#). With the recommendation of infectious diseases, Artesunate 120 mg intravenous (IV) loading dose was followed by maintenance treatment, as Artemeter 20 mg+Lumefantrine 120 mg nasogastric 2x4 tablets. Continuous renal replacement therapy (CRRT) was decided, and a jugular dialysis catheter was applied. The device was arranged as continuous venovenous hemodiafiltration (CVVHDF). A total of 1000 ml of dialysate, 1000 ml replacement fluid, and 100 ml ultrafiltration per hour were adjusted. Malaria and supportive treatments were continued with CRRT for approximately 72 hours.

During this period, the patient was sedated for mechanical ventilation and compliance with CRRT. In the first 24 hours of CRRT, the creatinine value increased to 7.2 mg/dl and then gradually decreased and regressed to 2.3 mg/dl after CRRT. On the second day of CRRT, the hemoglobin level decreased to 6.8 mg/dl, and two units of hemoglobin suspension were transfused. Urine output started on the third day of CRRT. After CRRT was ended, sedation was stopped, and the patient waited for awakening. The patient, who was almost entirely conscious of the situation, was weaned off the mechanical ventilator. On the fifth day of hospitalization for the patient in the ICU, GCS=15 and creatinine=1.55 mg/dl. He was discharged to the infectious diseases clinic in good health ([Table 2](#)).

DISCUSSION

The severe and deadly consequences associated with *P. falciparum* infection make it more dangerous than other malaria species. The mortality rate shows significant variation since it is influenced by factors such as the type of infection, the characteristics of the host, the surrounding circumstances, and the quality of treatment received. When comparing cases with similar levels of severity upon admission, the outcomes tend to be more favorable in well-equipped intensive care units (ICUs) staffed by highly trained professionals, as opposed to peripheral health centers.⁷ Hyperparasitaemia, Blackwater fever, renal failure, acute malarial hepatitis, adult respiratory distress syndrome, adrenal insufficiency syndrome, cardiac arrhythmias, and gastrointestinal symptoms, including secretory diarrhea, are all caused by this deadly parasite.⁸ *P. falciparum* infects erythrocytes of any age, causing high-grade parasitemia. The parasite count can grow up to 20-fold in 48 hours without treatment because of its fast replication. In the therapeutic environment, parasitemia helps define severe *P. falciparum* malaria and tracks the effectiveness of antimalarial medication.⁹ There is a clear association between an individual's asexual erythrocytic-stage parasite density at the time of presentation and the severity of clinical illness in *P. falciparum* malaria.¹⁰ Here, the patient encountered the agent in his own country and came to our country within three days of his illness. Several

researchers advise only considering exchange transfusion for individuals with severe parasitemia.¹¹ A reduction in the risk of severe intravascular hemolysis and its consequences, better rheology, reduced microcirculatory sludging, and increased oxygen carrying capacity with transfused erythrocytes are all reasons to use exchange transfusion treatment.¹² The patient was in a precoma state. We started CRRT as we can decide quickly and start the fastest. Malaria-associated AKI has a death rate of up to 51%, with the poorest prognosis being delayed referral, severe jaundice, oliguria, and multiorgan involvement.¹³ Zheng et al.¹⁴ performed successful treatment in 12 patients with CRRT combined with artesunate. A small RCT compared CRRT with peritoneal dialysis in Vietnamese patients with AKI, mainly due to malaria. Twelve CRRT patients had decreased mortality and overall expenditures.¹⁵

CONCLUSION

Malaria remains a global problem, particularly among nonimmunized populations. AKI is prevalent in severe malaria patients. Severe malaria patients should be continuously monitored for renal involvement, including refractory electrolyte imbalances and fluid overload. Patients with oliguric AKI should be treated with supportive therapy. CRRT may be an effective option in these patients if possible.

ETHICAL DECLARATIONS

Informed Consent: All patients signed the free and informed consent form.

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Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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Post traumatic volvulus: a case report

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ABSTRACT

Volvulus is a clinical picture that causes obstruction in the gastrointestinal system and occurs as a result of rotation of the organ around its axis. Although it mostly develops in the colon segments, it rarely occurs in the stomach. The stomach normally stabilizes its position by connecting to the spleen, liver and diaphragm. Gastric tumors, focal adhesions or masses in adjacent organs that disrupt the normal anatomy may predispose to gastric volvulus. Diaphragmatic hernia accompanies volvulus in two thirds of cases. In this article, we present a case of gastric volvulus 10 years after penetrating chest trauma and accompanied by hiatus hernia.

Keywords: Volvulus, diaphragmatic hernia, stomach

INTRODUCTION

Volvulus is characterized by intestinal obstruction which occurs as a result of the rotation of the stomach and intestine segments around its axes. It is most commonly seen in the sigmoid colon and cecum and is rarely seen in other intestinal segments.¹ Gastric volvulus is a rare disease that causes temporary and mild symptoms. However, it can lead to obstruction and ischemia if the diagnosis cannot be made.² In this article, we present a case of gastric volvulus presented with hematemesis, which developed in the iatrogenic diaphragmatic hernia after penetrating chest trauma.

CASE

A 39-year-old male patient was admitted to the emergency department with nausea and vomiting after meals which occurs for 2 weeks. In the examination, abdominal pain last for 2 months and vomit was bloody in the last 2 days. The patient had a history of penetrating trauma on the left side of the chest 10 years ago. Laboratory tests showed mild leukocytosis and hypokalemia. Physical examination revealed mild epigastric sensitivity. There was any problem about defecation. In the chest exam there was diaphragmatic hernia on the left side (Figure 1). He was hospitalized at the gastroenterology service for follow-up and treatment. Since the patient had continuous vomiting, nasogastric tube (NG) insertion was planned for drainage, but it could not be pushed forward. Upper endoscopy was

ineffective because of dilatation of esophagus and stomach with liquid and food.



Figure 1. Herniated intestinal segments to the left hemithorax in X-Ray

He underwent abdominal tomography with the intestinal obstruction clinic. It was seen a defect of approximately 57 mm in the center santral left hemidiaphragm. The corpus distal of the stomach, pyloric, duodenum 1-2. continent and splenic flexure was herniated through the defect into the hemithorax. The corpus distal and duodenum 2. Continent were necked in the hernia neck and gastric axis was reported secondary to this change. The gastric corpus distal was dilated in the hemithorax, and it was evaluated as compatible with mesenteroaxial gastric volvulus. The patient consulted with gastroenterology surgery and operated (Figure 2).

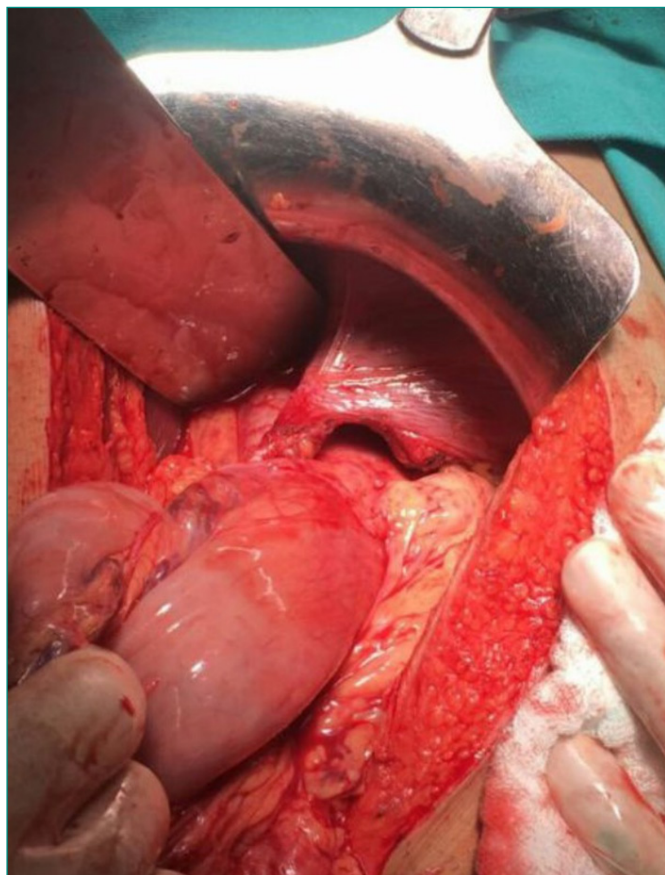


Figure 2. Intraoperative diaphragmatic hernia and herniated stomach

DISCUSSION

Gastric volvulus results when the stomach is twists on itself. It is rarely seen without diaphragmatic hernia. In the literature a first case of diaphragmatic hernia developed after sword injury was described in 1579.¹

It is not related to gender and race.³ It develop most common secondary to congenital diaphragmatic defect in children. It developed congenitally in the malrotation situation, laxity of the stomach ligaments, left diaphragmatic elevations, or akkiz in older age, diaphragmatic disorders, phrenic nerve palsy, kyphoscoliosis, focal adhesions, gastric tumor or adjacent masses.^{2,3} Most cases develop above the diaphragma associated with paraesophageal or mixed diaphragmatic hernia.²

Gastric volvulus is classified as organoaxial or mesenteroaxial according to the axis of rotation, as primary (idiopathic) or secondary according to the etiology and as acute or chronic according to clinical picture.

Organoaxial rotation develops as a result of the rotation of the stomach along the long axis of the stomach. It is the most common type of gastric volvulus occurring in 60% of cases, is frequently associated with diaphragmatic hernia and secondary etiologies. Stomach strangulation is more common in this type of volvulus.⁴ Mesenteroaxial volvulus occurs as a result of rotation of the stomach along its vertical axis,⁵ rotation is often incomplete and intermittent, not associated with a secondary anatomical defect and leads to chronic symptoms.

Primary (idiopathic) gastric volvulus occurs as a result of neoplasia, adhesions, gastric ligaments disorders due skeletal deformity and causes more chronic symptoms.⁵ Secondary gastric volvulus constitutes two-thirds of patients with gastric volvulus and occurs due to reasons such as paraesophageal hernia, diaphragmatic hernia (Morgagni's hernia, Bochdalek's

hernia, traumatic hernia), diaphragma evantration, phrenic nerve paralysis. The most common diaphragmatic defect associated with gastric volvulus in adults is paraesophageal hernia.⁶

Clinically, acute or chronic onset abdominal pain, vomiting or chest pain are seen. Acute gastric outlet obstruction may be present in patients with a rotation of $> 180^\circ$, while partial gastric occlusion symptoms may be intermittent and chronic in patients with a lower degree of rotation. Since it is a rare condition, it is not considered in the differential diagnosis of these symptoms. The Borchardt triad, consisting of pain, vomiting and nasogastric tube insertion, occurs in 70% of patients with acute gastric volvulus.⁷ Peritonitis may occur in patients with gastric ischemia due to strangulation or perforation.

Symptoms are obscure in patients with chronic gastric volvulus; mild upper abdominal discomfort, dysphagia, dyspeptic symptoms can be seen. It can be caused to gastric ulcer, occult hemorrhage and chronic anemia. In the diagnosis, besides the history and physical examination, imaging methods should be used in patients with suspected gastric volvulus. Chest and abdominal radiography reveal a single large, spherical gas view with air-fluid levels in upper abdomen or chest film.⁸ This finding is not common in patients with partial volvulus (rotation $<180^\circ$). Computed tomography reveal typically abnormal location of stomach in the chest. The frequently used endoscopy has a low sensitivity in the diagnosis of gastric volvulus (32-45%).⁹

The patient should be hemodynamically stabilized and N/G decompression should be performed. Spontaneous derotation with N/G decompression may occur. Endoscopic decompression and derotation can be performed in patients whom N/G decompression is unsuccessful. If decompression couldnt be done, it is suggestive of having strangulation and indicating the need for emergency surgery. Acute gastric volvulus has a mortality rate of 30-50% when the diagnosis is missed and treatment is postponed. For patients with primary chronic gastric volvulus, after a successful derotation (laparoscopic/endoscopic), gastric fixation alone may be sufficient to prevent recurrent rotation. Surgical treatment is a suitable option for patients with moderate to severe symptoms of secondary chronic gastric volvulus. For patients with mild symptoms, especially if the patient has a limited life span or is a poor candidate for repair, conservative treatment without intervention may be more appropriate.

CONCLUSION

We report a case of mesoaxial gastric volvulus secondary to diaphragmatic injury due to trauma. Gastric volvulus should be considered in differential diagnosis in patients presented nausea, vomiting and abdominal pain symptoms and having risk factors for congenital or acquired gastric volvulus. So appropriate examination and treatment should be done without any serious complication.

ETHICAL DECLARATIONS

Informed Consent: All patients signed the free and informed consent form.

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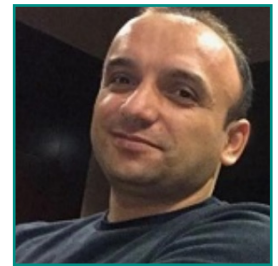
Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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A rare tumor cause of ileus: primary intestinal lymphoma

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ABSTRACT

Primary intestinal lymphomas (PBL) are rare tumors and extranodal lymphomas. They constitute 1% of malignant tumors of the gastrointestinal (GI) system. Colorectal lymphomas constitute 10-20% of all GI lymphomas and are most commonly located in the cecum. For a case to have PBL, in addition to the dominant GI symptoms, the clinical and radiological absence of pathological lymph nodes located outside the intestine, mediastinum, abdomen, or peripheral is required. In addition, there should be no findings in favor of lymphoma in the liver, spleen, and bone marrow. In this report, a 59-year-old female patient who was admitted to the emergency department with a clinical diagnosis of obstructive ileus while being investigated for abdominal pain lasting for 1 month, was operated on because of the development of an acute abdomen and an obstructive mass as a result of imaging, and was reported as having diffuse large cell lymphoma as a result of postoperative pathology, lastly as a result of the examinations performed, primary intestinal lymphoma was detected, and the diagnosis of the disease is presented. Since the first presentation of PBL may be intestinal obstruction and/or perforation due to delayed diagnosis, PBL should be kept in mind in patients presenting with obstructive ileus in emergency admissions.

Keywords: Primary gastrointestinal lymphoma, ileus, colorectal cancer

INTRODUCTION

Primary intestinal lymphomas (PBL) are extranodal lymphomas and are extremely rare tumors.¹ They constitute 1% of malignant tumors of the gastrointestinal (GI) system. Colorectal lymphomas constitute 10-20% of all GI lymphomas and are most commonly located in the cecum. Primary lymphoma of the colon, on the other hand, constitutes 0.2-1.2% of all colon malignancies.² The incidence is most common in patients over 50 years of age and is more common in women.³ Abdominal pain (90%) is the most common clinical finding, and the others are abdominal mass (% 80), weight loss (45%), diarrhea, fever, loss of appetite, and constipation.⁴ Obstruction is seen at a rate of 20-25% and perforation is less frequent.⁵ We aimed to present our case of intestinal lymphoma due to its rarity. In this study, we aimed to present the case of intestinal lymphoma that admitted with GI tract symptoms clinic in contrast to classical lymphoma symptoms because of its rarity.

CASE

A 59-year-old female patient, who has no known additional disease other than diabetes mellitus, and has a history of surgery due to a previous knee and ovarian cyst,

is being examined by the internal medicine clinic with outpatient follow-up due to abdominal pain that started 1 month ago. In the follow-ups, the patient has undergone a colonoscopy, and abdominal imaging is planned. During this period, the patient applied to our emergency department with complaints of sudden onset of abdominal pain, bloating, and inability to pass gas and stool.

In the physical examination; blood pressure 110/70 mmHg pulse: 90/min, Glasgow coma scale: 15, conscious, oriented, and cooperative. In the abdominal examination, there was a tenderness in the right lower quadrant, and no defense or rebound was detected. There was normal stool contamination on rectal touch.

In laboratory tests: White blood cell count (WBC): 13.2×10^9 (11.8 Neu), hemoglobin: 11.1 mg/dl, C-reactive protein (CRP): 30 mg/l, creatinine: 1.0 mg/dl, urea: 20 mg/dl, International normalized ratio (INR): 1.2.

In standing direct abdominal X-ray, there are 5–6 small intestine type air-fluid levels, in the contrast-enhanced abdominal tomography (CT) it was reported as “There is no evidence of intra-abdominal metastasis, asymmetric wall thickening at the level of the cecum, contamination in the surrounding adipose tissue, many millimetric lymph nodes, air-fluid levels in the ileal loops starting from the terminal

ileum level, an appearance reaching a diameter of 34 mm, and there is also 4 cm of fluid in the pelvis.” (Figure 1)



Figure 1. Abdominal tomography sections show irregular wall thickening (Black Arrow) at the level of the cecum and dilatation in the proximal small bowel loops.

Due to acute abdomen findings, severe abdominal distension and an occlusive lesion in the cecum, the patient was decided to have an emergency operation. During the exploration, no additional pathology was detected except for mass wall thickening at the level of the cecum and ileus, where the transition was at this level. The patient underwent right hemicolectomy and ileotransverse anastomosis (Figure 2). The patient, whose drain was terminated during the follow-ups, whose physical examination was normal, tolerated the regimen, and had discharged, was discharged on the 6th postoperative day.

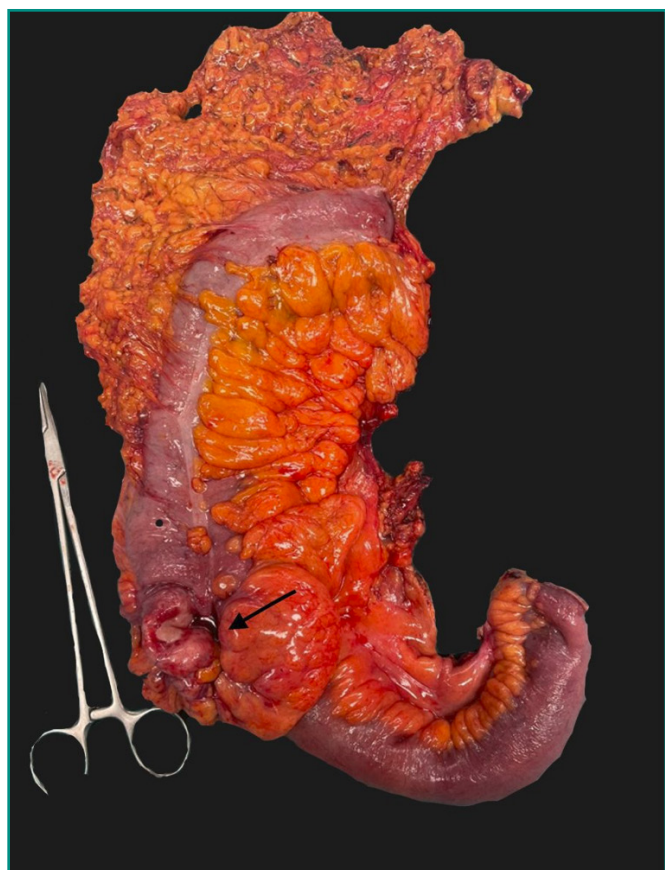


Figure 2. A right hemicolectomy surgical specimen and a tumoral mass located in the cecum (Black Arrow) are shown.

Pathology result; diffuse large cell lymphoma localized to the ileo-cecal region was reported. There was no involvement in the 35 resected lymph nodes and the appendix. In the immunohistochemical examinations, “90% with CD20

positivity ki67 40% with MUM1, 10-15% with bcl6; It was reported as “PankCK, CD3, CD10, bcl2 negative”. No significant pathological uptake was detected in PET/CT taken for postoperative scanning, and the patient was transferred to the hematology clinic with the diagnosis of PBL. The patient was started on R-CHOP (rituximab, cyclophosphamide, adriamycin, vincristine, methyl prednisolone) chemotherapy by the hematology clinic.

Table 1. Diagnostic criteria for primary bowel lymphoma¹¹

1- Absence of peripheral lymphadenopathy
2- Absence of pathologically mediastinal lymph nodes
3- Normal white blood cell count and peripheral smear
4- Normal bone marrow
5- The main lesion is in the gastrointestinal system and the pathological lymph node is in the area where the lesion drains
6- Absence of liver and spleen involvement

DISCUSSION

Its etiology is not known exactly, and it takes the 5th place among deaths due to malignancy.⁶ In recent years, studies have found associations between intestinal lymphoma and immunosuppression after transplantation, celiac disease, inflammatory bowel disease, or human immunodeficiency virus (HIV) infection.⁷ PBL is a heterogeneous group with different clinical and pathological manifestations, constituting the largest group with 4-12% of non-Hodgkin lymphomas and 40-50% of primary extranodal lymphomas.⁸ PBL is located in the stomach (50-60%), small intestine (20-30%), colon, and rectum (10-20%), in order of frequency. Primary lymphoma of the colon constitutes 0.2-1.2% of all colon malignancies⁹ and has a better prognosis than other malignancies (adeno CA, carcinoid, etc.).⁵

The most common symptom of GI lymphoma is abdominal pain; however, signs and symptoms are often nonspecific. In PBL, abdominal pain and vomiting are prominent in proximal cases, and abdominal distension is in distal localized cases. In the absence of disease-specific symptoms and intestinal obstruction, the diagnosis may be delayed.^{1,2} Complications such as obstruction, perforation, bleeding, and intussusception may occur.¹⁰ In our case, the patient admitted to the emergency room with non-specific gastrointestinal system symptoms in the last 1 month, and an emergency operation was decided without a definitive diagnosis due to obstructive symptoms.

Differentiation of primary lymphoma from secondary lymphoma is important because treatment approaches differ.¹¹ There are some criteria for accepting lymphomas seen in the GI system as primary. Peripheral smear and white blood cell were normal, peripheral lymph node and pathological mediastinal lymph node were absent, chest X-ray was normal, liver and spleen were not involved, and the lesion was limited to the gastrointestinal tract.

The cell type from which the tumor originates is generally B-cell (80-85%), as in the presented case, and to a lesser extent, T-cell (10-40%), which is reported to have a worse prognosis.¹² The prognostic features of the tumor; perforation, high grade histology, multiple mass and tumor stage.

It has been reported that the combined application of surgical resection of the mass and chemotherapy in PBL provides a successful remission of the disease and prevents complications.¹³

CONCLUSION

Unlike the classic lymphoma symptoms and clinic, PBLs can present unexpectedly. In conclusion, although rare, the diagnosis of PBL should be kept in mind for patients presenting with chronic GI system symptoms. Early diagnosis and complete resection without delay are important in terms of preventing morbidity and mortality.

ETHICAL DECLARATIONS

Informed Consent: All patients signed the free and informed consent form.

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