AKADEMİK GASTROENTEROLOJİ DERGİSİ

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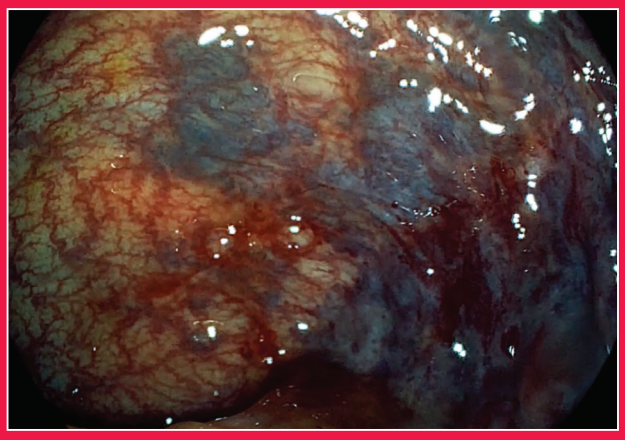
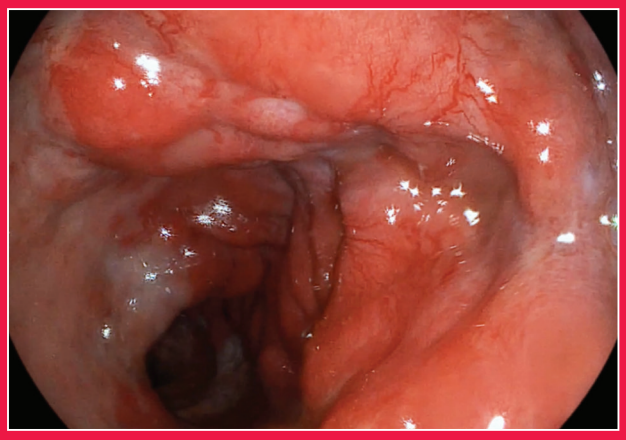


Colonoscopic image of diffuse cavernous hemangioma in rectosigmoid colon, i-scan imaging.



Diffuse cavernous hemangioma after the embolisation treatment.

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Üçten fazla yazarlı makale için;

Mungan Z, Demir K, Onuk MD, ve ark. Gastroözofageal reflü hastalığının ülkemizdeki özellikleri. Turk J Gastroenterol 1999;10:101-7.

Kitap kaynağı yazım örneği;

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Ağustos 2024; Cilt: 23 Sayı: 2
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ORIGINAL ARTICLE

Is *Helicobacter pylori* positiveness a factor in the success of the intragastric injection of Botulinum toxin in the treatment of obesity?

Mide içi Botulinum toksini enjeksiyonunun obezite tedavisindeki başarısında *Helicobacter pylori* pozitifliği bir faktör müdür?

Mevlüt HAMAMCI[1], Kerem KENARLI[1], H. Tankut KÖSEOĞLU[1], Ahmet AKBAY[1], Çağdaş ERDOĞAN[2], Alper MACİF[1], Meryem Didem GÖKTAŞ[3], Çağdaş KALKAN[1], Fırathan SARIALTIN[4], Mahmut YÜKSEL[1]

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Background and Aims: Obesity is becoming more common around the world. Although there have been many developments in the treatment of obesity recently, endoscopic treatment methods have an important place due to their low side effects and higher success rate compared to behavioral treatments. Although studies on intragastric botulinum toxin injection have had confusing results, the reason why the treatment causes these different results has not been clarified. Our aim in this study was to evaluate the presence of *Helicobacter pylori* infection, which may affect the success of intragastric botulinum toxin injection treatment. **Materials and Methods:** Patients with a body mass index of greater than 25 kg/m^2 and at least one obesity-related complication, or a body mass index of greater than 30 kg/m^2 without complications, were eligible for the study if they were between the ages of 18 and 65. In all patients, a biopsy was taken for *Helicobacter pylori* evaluation from the stomach antrum simultaneously with intragastric botulinum toxin administration. **Results:** In our study on 80 patients, compared to their beginning weight, the patients' weights in all groups decreased statistically significantly ($p < 0.001$). However, neither *Helicobacter pylori* density nor *Helicobacter pylori* presence had a statistically significant impact on weight loss in the second or sixth months. **Conlusion:** It has been shown that *Helicobacter pylori* infection, which is one of the conditions that may cause conflicting results of intragastric botulinum toxin administration, has no effect on weight loss.

Key words: Obesity, Botulinum, *Helicobacter pylori*, body mass index, endoscopic treatment, intragastric injection

Giriş ve Amaç: Obezite dünya çapında giderek yaygınlaşmaktadır. Son yıllarda obezite tedavisinde pek çok gelişme yaşansa da endoskopik tedavi yöntemleri, davranışsal tedavilere göre yan etkilerinin düşük olması ve başarı oranının daha yüksek olması nedeniyle önemli bir yere sahiptir. İntragastrik Botulinum toksin enjeksiyonu ile ilgili yapılan çalışmalarda kafa karıştırıcı sonuçlar olmasına rağmen bunun sebebi hala açıklığa kavuşturulamamıştır. Bu çalışmadaki amacımız *Helicobacter pylori* enfeksiyonunun intragastrik Botulinum toksin enjeksiyon tedavisi başarısı üzerindeki etkilerini değerlendirmektir. **Gereç ve Yöntem:** On sekiz ile 65 yaşları arasında, vücut kitle indeksi 25 kg/m^2'nin üzerinde ve en az bir obezite ile ilişkili komplikasyonu olan veya komplikasyon olmadan vücut kitle indeksi 30 kg/m^2'den fazla olan 80 hasta çalışmaya dahil edildi. *Helicobacter pylori* değerlendirmesi için intragastrik Botulinum toksini uygulaması esnasında mide antrumundan biyopsiler alındı ve hastalar *Helicobacter pylori* pozitifliği veya negatifliğine göre iki gruba ayrıldı. **Bulgular:** Çalışmamızda her iki grupta da başlangıç kilolarına göre istatistiksel olarak anlamlı azalma görüldü ($p < 0.001$). Ancak mide mukozasında *Helicobacter pylori* varlığı veya yoğunluğunun kilo kaybı üzerinde istatistiksel olarak anlamlı bir etkisi yoktu. **Sonuç:** İntragastrik Botulinum toksini uygulamasında çelişkili sonuçlara neden olabilecek durumlardan biri olan *Helicobacter pylori* enfeksiyonunun kilo kaybına etkisinin olmadığı gösterilmiştir.

Anahtar kelimeler: Obezite, Botulinum, Helicobacter pylori, vücut kitle indeksi, endoskopik tedavi, intragastrik enjeksiyon

INTRODUCTION

Obesity is a long-lasting, worsening, and recurring condition that is becoming more common worldwide. It is linked to increased illness and death, as well as a decrease in quality of life. Treating obesi-

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ty necessitates a comprehensive medical approach that includes behavioral interventions, medication, endoscopic procedures, and bariatric surgery. The amount of weight loss achieved with any of these methods is highly variable, and long-term weight maintenance is difficult. Obesity is a significant health issue in the contemporary world, according to the World Health Organization. It is estimated that more than half of the world's population will be overweight or obese by the year 2030 (1).

Obesity is a complex condition that is difficult to manage. Traditional methods of weight loss, such as diet and exercise, are often not effective in the long term (2). Bariatric surgery is more effective, but it is also more invasive and can have serious side effects (3). Moreover, only a small percentage of patients who are eligible for bariatric surgery actually receive it (4). Endoscopic treatment methods are a newer approach to weight loss that offer some advantages over traditional methods. They are less invasive, reversible, and have a shorter recovery time. However, they are not as effective as surgery and may not be available for all patients. The ideal method for treating obesity would be a combination of effective weight loss and low-side effects. Endoscopic treatment methods show promise as a new option for people with obesity, but more research is needed to determine their long-term effectiveness and safety (5).

Endoscopic intragastric Botulinum toxin type-A (BTX-A) injection is a minimally invasive procedure that uses an endoscope to inject BTX-A into the stomach. BTX-A is a neurotoxin that blocks the release of acetylcholine, a neurotransmitter that causes muscle contraction. When BTX-A is injected into the stomach wall, it paralyzes the stomach muscles, slowing gastric emptying. This makes the patient feel full sooner and eat less food. BTX-A also blocks the secretion of ghrelin, a hormone that stimulates appetite. This further helps to reduce hunger and promote weight loss (6). Endoscopic intragastric BTX-A injection is not a cure for obesity, but it can be an effective way to help people lose weight and improve their health. The procedure is less invasive than surgery and has fewer side effects. If the patient is not satisfied with the results or the resulting side effects the procedure can be reversed.

The effectiveness of gastric injections of BTX-A as a primary treatment for obesity is not well established, as the results of studies in the literature are inconsistent. While some meta-analyses show that it is beneficial for weight loss (6), some have found that it is not beneficial (7). The inconsistent results of studies on the efficacy of intragastric BTX-A injections for obesity may be due to the small sample sizes of the studies, the differences in the location of the injections, the doses of BTX-A used, the skill of the operators who performed the injections, and other reasons that are not yet known.

Approximately half of the world's population is infected with *Helicobacter pylori (H. pylori)* (8). Although *H. pylori* infection is the main cause of chronic gastritis and peptic ulcer disease (9), the spectrum of gastroduodenal effects associated with the development of infection is quite wide. *H. pylori* infection can disrupt the secretion of gastrointestinal hormones such as somatostatin and cholecystokinin (10). *H. pylori* infection can affect gastric emptying. This is due to the increased release of leukotrienes, nitric oxide, and other substances, which can lead to gastrointestinal smooth muscle relaxation and delayed gastric emptying. Alternatively, an increase in 5-hydroxytryptamine and other substances can affect gastrointestinal smooth muscle contraction, resulting in gastrointestinal motility disorders (11-13).

Our aim in this study was to evaluate whether *H. pylori* positivity is a possible factor affecting the success of intragastric BTX-A treatment by comparing *H. pylori*-positive and *H. pylori*-negative

patients with intragastric BTX-A injection for the treatment of obesity.

MATERIALS and METHODS

The study was conducted at our centre from January 2022 to April 2023. All morbidly obese patients who required treatment to reduce their body weight were evaluated according to the admission criteria. The protocol for the study was approved by the local ethics committee (Ankara Bilkent City Hospital, Presidency of Clinical Research Ethics Committee, No. E1-23-3989) and conducted in accordance with the Declaration of Helsinki. All patients provided informed consent for the diagnostic and therapeutic procedures.

The following were considered exclusion criteria: a history of cancer, pregnancy (even potential), stomach surgery, or gastrointestinal motility diseases. All patients had a preliminary interview with a dietitian to assess their eating habits and rule out binge eating. During the first week, they kept a food diary to evaluate the amount of calories consumed and the proportion of fat, protein, and carbohydrates.

Eighty patients with obesity between the ages of 18 and 65, with a body mass index (BMI) of > 25 kg/m^2 and at least one obesity-related complications (such as osteoarthritis, sleep apnea etc.), or a BMI of > 30 kg/m^2 without complications, were enrolled in the study. Body weight and height were measured, and BMI was calculated immediately before the endoscopic injection. All patients were evaluated for obesity by measuring their lipid profile, hormone profile, HbA1c, fasting and postprandial blood sugar tests, and homeostatic model assessment of insulin resistance (HOMA-IR) level before treatment. In all patients, a biopsy was taken for *H. pylori* evaluation from the stomach antrum simultaneously with intragastric BTX-A administration. Body weight and BMI were measured two and six months after treatment, respectively. All measurements were performed by a dietitian. On these visits, symptoms and the occurrence of adverse effects were recorded. The patients were allowed to eat as usual.

Two vials of BTX-A (Botox®, Allergan Incorporated, or Dysport®, abobotulinumtoxinA, Ipsen) were reconstituted with a 0.9% sodium chloride solution. Since only these two brands are licensed in our country, one of these two brands was used. Each vial contained 100 U of Botulinum toxin A, for a total of 200 U of BTX-A in 20 mL of diluent. Starting 3 cm from the pyloric ring, microinjections with 25 U of BTX-A were given at four points around the stomach. Microinjections with 10 U of BTX-A were given four times to the proximal of the antrum, four times to the incisura angularis, and two times to the distal of the corpus. The total dose was 200 U. BTX-A was injected into the gastric wall using a standard 5-mm sclerotherapy needle. The needle was inserted deeply into the gastric wall, and the BTX-A solution was injected slowly. The procedure took less than 30 minutes to complete. No significant acute side effects were recorded. All patients were observed for 1 hour.

Statistical Analysis

Analyses were made by using IBM SPSS Statistics for Windows, version 25.0 (IBM Corp., Armonk, N.Y., USA). In qualitative data, descriptive statistics are displayed as numbers (n) and percentages (%). In quantitative data, the median and minimum-maximum values are provided for non-normally distributed data, whereas the mean and standard deviation are provided for normally distributed data. Since the assumptions of a normal distribution were not given, the Friedman test was utilized to compare repeated measurements. For all statistics, the Type 1 margin of error (alpha) was accepted at 0.05. A two-tailed p-value of 0.05 was considered significant.

RESULTS

The median age of the overall study population was 35 (28 - 41), and 85% (n = 68) of the participants were female. In 48.8% of the patients (n = 39), Botox was utilized, and in 51.2% (n = 41), dysport was used. In 91.2% (n = 73) of the patients, there were no adverse reactions attributable to the procedure. For 61.3% (n = 49) of the patients, there were no comorbidities found prior to the procedure. While 48.8% (n = 39) of the study's patients did not have a history of obesity in the family, 41.2% (n = 33) did in one of the parents, as did 5% (n = 4) in one of the siblings, 2.5% (n = 2) in one of the children, and 2.5% (n = 2) in one of the other family members. While 38.7% (n = 31) of the patients did not smoke or drink, 51.3% (n = 41) smoke, 2.5% (n = 2) did drink, and 7.5% (n = 6) did smoke and drink alcohol. The patients who participated in the study had mean HbA1c levels of 5.68 (4.9 - 9.7) and mean HOMA-IR levels of 4.75 (0.8 - 33.5). Gastric biopsy results revealed that *H. pylori* was not found in 50% of the patients (n = 40). On the other hand, while 8.8% (n = 7) of the patients had 2+/3+ *H. pylori* detected, 41.2% (n = 33) of the patients had 3+/3+ *H. pylori* detected. Table 1 and 2 provides demographic information, laboratory results, and descriptive statistics for the study group.

The mean patient body weight at the beginning of the trial was 98.6 kg (73 - 150), and the mean BMI was found to be 35.74 kg/m2 (28.34 - 53.78) when the entire study group was examined. The patients' mean body weights and BMIs in the second month following the procedure were 89.38 (69 - 138) kg and 32.43 kg/m2 (25.34 - 50.71), respectively. According to baseline weight and BMI values, the change in weight and BMI values after two months was statistically significant ($p < 0.001$). At the end of the sixth month, the patients' average weight was 88.38 kg, and their BMI was 32.01 kg/m2. No statistically significant difference was discovered when compared to the second month ($p = 0.458$), even though there

Table 1 Demographic information, laboratory results, and descriptive statistics for the study group

	Total (n = 80)
Age, years	35 (28 - 41)
Gender (n, %)	
Female	68 (85)
Male	12 (15)
Botox type (n, %)	
Botox	39 (48.8)
Disport	41 (51.)
Adverse effect (n, %)	
No	73 (91.2)
Yes	7 (8.8)
Comorbidities (n, %)	
No	49 (61.3)
Yes	31 (38.7)
Obesity in family (n, %)	
No	39 (48.8)
Parents	33 (41.2)
Siblings	4 (5)
Children	2 (2.5)
Other	2 (2.5)
Helicobacter pylori (n, %)	
None	40 (50)
+2	7 (8.8)
+3	33 (41.2)
Endoscopic findings (n, %)	
Pangastritis	56 (70)
Antral gastritis	20 (25)
Esophagitis	4 (5)
Habits (n, %)	
No	31 (38.7)
Smoking	41 (51.3)
Alcohol	2 (2.5)
Smoking and alcohol consumption	6 (7.5)
Height (cm) mean ± standart deviation	165.57 ± 7.58
Body weight (kg) mean, (min - max)	98.6 (73 - 150)
BMI (kg/m²) mean,(min-max)	35.74 (28.34 - 53.78)
Body weight at 2 month (kg) mean, (min-max)	89.38 (69 - 138)
Body weight at 6 month (kg) mean, (min-max)	88.38 (66 - 128)

was a statistically significant difference when compared to the baseline weight ($p < 0.001$).

According to the presence and density of *H. pylori*, weight changes at the second and sixth months in patients receiving gastric Botulinum toxin treatment were assessed in Table 3. Compared to their beginning weight, the patients' weights in all groups decreased statistically significantly ($p < 0.001$). However, neither *H. pylori* density nor *H. pylori* presence had a statistically significant impact on weight loss in the second or sixth months. Figures 1-3 compare the participants' initial, second, and sixth-month weights based on the presence and density of *H. pylori*.

Table 2 Laboratory results for the study group

HbA1c (%) mean, (min - max)	5.68 (4.9 - 9.7)
Fasting glucose (mg/dl) mean, (min - max)	98.07 (75 - 274)
Post-meal glucose (mg/dl) mean, (min - max)	110.44 (62 - 405)
AST (U/L) mean, (min - max)	25.47 (13 - 66)
ALT (U/L) mean, (min - max)	36.36 (14 - 118)
Albumine (g/L) mean ± standart deviation	45.3 ± 0.21
Creatine (mg/dl) mean, (min - max)	0.73 (0.52 - 1.13)
Total cholesterol (mg/dl) mean ± standart deviation	191.34 ± 37.59
LDL (mg/dl) mean ± standart deviation	115 ± 31.41
HDL (mg/dl) mean ± standart deviation	47.03 ± 10.54
Triglycerides (mg/dl) mean, (min - max)	146.5 (55 - 388)
TSH (mU/L) mean, (min - max)	2.22 (0.17 - 7.51)
Androstenedione (nmol/L) mean, (min - max)	7.91 (1.05 - 30.10)
DHEA-S (µg/dL) mean, (min - max)	183.40 (43.8 - 346.66)
HOMA-IR mean, (min - max)	4.75 (0.8 - 33.5)
HbA1c mean, (min - max)	5.68 (4.9 - 9.7)
Insuline (mU/L) mean, (min - max)	17.78 (3.9 - 93.6)
C-peptide (µg/L) mean, (min - max)	2.65 (1.29 - 8.38)
Hgb (g/dl) mean, (min - max)	13.65 (8.5 - 5.9)
Platelet ($x10^9$/L) mean, (min - max)	269.23 (158 - 477)

HbA1c: Glycated hemoglobin; AST: Aspartate aminotransferase; ALT: Alanine transaminase; LDL: Low density lipoprotein; HDL: High density lipoprotein; TSH: Thyroid stimulating hormone; DHEA-S: Dehydroepiandrosterone sulphate; HOMA-IR: Homeostatic model assessment of insulin resistance; Hgb: Haemoglobin.

Table 3 Weight changes according to presence and density of *Helicobacter pylori*

HP	Body Weight Median, (min - max)	Body Weight at 2 Month Median, (min - max)	Body Weight at 6 Month Median, (min - max)	p Value
No *HP*	93 (73 - 111)	86 (64 - 105)	85 (62 - 104)	< 0.001
2+	115 (83 - 150)	104 (73 - 138)	91 (73 - 138)	0.016
3+	93.7 (80 - 140.3)	88 (69 - 134)	86 (66 - 134)	< 0.001

HP: Helicobacter pylori

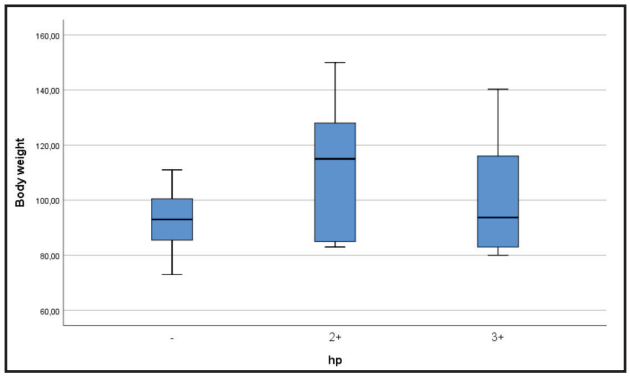

Figure 1 Baseline body weight according to *H. pylori* presence and density.

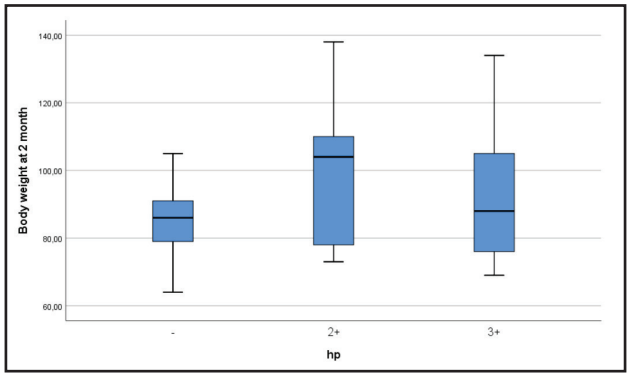

Figure 2 Second month body weight according to *H. pylori* presence and density.

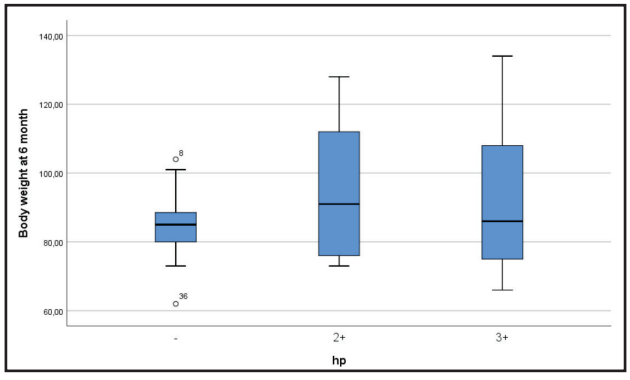

Figure 3 Sixth month body weight according to *H. pylori* presence and density.

DISCUSSION

Non-systematic reviews have been published regularly since 2007 (19), supporting the use of BTX-A as a primary treatment for obesity. This may have led doctors to use this technique in their daily practice. Although intragastric injection of BTX-A has been used clinically for more than ten years, its effectiveness is still being debated. Different results have been obtained in meta-analyses on this subject. Bang et al. found that intragastric injection of BTA was effective for the treatment of obesity (6). A meta-analysis of seven studies involving 115 patients found that the injected dose of BTX-A ranged from 100 to 500 IU. Four studies used the antrum-only injection method, while three studies used the wide-area injection method. The number of injections ranged from 5 to 20. A recent meta-analysis of four randomized controlled trials involving 96 patients found that BTX-A therapy alone is not an effective treatment for obesity (7). The meta-analysis found that BTX-A therapy resulted in a mean weight loss of 4.2% at 6 months, which was not significantly different from the placebo group. The studies included in this meta-analysis, as in other meta-analyses, used a wide variety of BTX-A doses, sites, and number of injections, which has created heterogeneity. Similarly, there are inconsistencies in the results of other recent meta-analyses with heterogeneity problems. Another recent meta-analysis, including five studies, showed significant weight loss in patients with BMI > 40 kg/m^2 (27) and, lastly, a meta-analysis of four systematic reviews and six studies concluded that intragastric injection with BTX-A is an ineffective procedure for reducing body weight and body mass index when the Knapp-Hartung method is applied (28). There can be many factors -BTX-A doses in studies, injection stomach areas, patient selection, etc.- affecting all these confusing results. The injection of BTX-A into different parts of the stomach may lead to different results. For example, injecting BTX-A over the pylorus, the circular muscular structure at the end of the stomach, can theoretically lead to temporary paralysis of the pylorus. This can result in a decrease in the pressure

inside the stomach, which can help maintain sufficient gastric emptying (29,30).

Based on previous studies showing that *H. pylori* influences gastric motility (31) and ghrelin secretion (32), we conducted this study to see if it would have an effect on the success of BTX-A injection. There is no previous study on this subject in the literature. Studies investigating the effect of *H. pylori* on ghrelin and therefore gastric motility have shown that as *H. pylori* density increases, its effect on gastric motility changes through multiple mechanisms (33). Therefore, it is more accurate to examine subgroups not only based on *H. pylori* positivity but also based on *H. pylori* density. According to the presence and density of *H. pylori*, weight changes at the second and sixth months in patients receiving gastric Botulinum toxin treatment were assessed and compared to their beginning weight. The patients' weights in all groups decreased statistically significantly ($p < 0.001$). However, neither *H. pylori* density nor *H. pylori* presence had a statistically significant impact on weight loss in the second or sixth months.

H. pylori prevalence is 10 - 50% in developed countries and 80% in developing countries, the annual incidence being 1% and 5 - 10%, respectively. The epidemiology of *H. pylori* varies widely according to age, socioeconomic status and geographic area (34). In descriptive studies on *H. pylori* in our country, the incidence was found to be 82.5% (35), and this situation should definitely be taken into consideration in treatments that may have an effect on the pathophysiological results of *H. pylori*.

The main limitations of our study are its single center, a small number of patients, and a heterogeneous patient population. This limits the ability of the study to draw conclusions regarding long-term outcomes. In addition, since the gastric emptying time of the patients included in the study was not measured objectively, some other factors that may affect gastric motility may have been missed.

There is no previous study on this subject in the literature. In conclusion, a cautious approach is required in interpreting the results of this study, and further studies examining other factors that may be effective, such as the ideal dose, ideal injection sites, and *H. pylori* infection, are needed to support the use of intragastric BTX-A injection as a treatment for obesity.

Ethics: *The protocol for the study was approved by the local ethics committee of Ankara Bilkent City Hospital, with the number E1-23-3989 and date of 12.09.2023.*

Conflicts of Interest: *None of the authors have any potential conflicts of interest associated with this research.*

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ÖZGÜN ARAŞTIRMA

Kronik hepatit C tedavisinde sona mı gelindi? Tek merkez deneyimi

Has the treatment of chronic hepatitis C come to an end? Single center experience

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Giriş ve Amaç: Direkt etkili antiviral kombinasyonlarının, klinik çalışmalarda kronik hepatit C virüsü enfeksiyon yükünü azaltmada oldukça etkili olduğu gösterilmiştir ve Avrupa Karaciğer Çalışmaları Derneği tedavi kılavuzları tarafından da tavsiye edilmektedir. Merkezimizde en önemli sağlık sorunlarından biri olan kronik hepatit C virüsü enfeksiyonunda güncel tedavide kullanılan Glecaprevir/Pibrentasvir tedavi rejiminin sonuçlarını sunmayı amaçladık. **Gereç ve Yöntem:** Bu çalışmaya, Atatürk Üniversitesi Araştırma Hastanesi Gastroenteroloji Kliniğinde tedavi naif kronik hepatit C enfeksiyonu tanısı ile 8 hafta Glecaprevir/Pibrentasvir tedavisi verilen ve tedaviyi tamamlayan 47 hasta dahil edildi. Hastaların yaş, cinsiyet, hepatit C virüsü genotip alt tipi, HCV-RNA düzeyi temelinde demografik ve laboratuvar verileri değerlendirildi. Tedaviyi tamamlayan hastaların tedavi başlangıç, 12. hafta, tedavi sonu HCV-RNA düzeyleri kaydedildi. Tedavi sonrası 12. hafta HCV-RNA düzeyi kalıcı viral yanıt değerlendirilmesinde kullanıldı. **Bulgular:** Glecaprevir/Pibrentasvir tedavisi alan 47 hastanın yaş ortalaması 57.64 ± 15.71 olup, 20'si (%42.62) kadın 27'si(%57.4) erkek idi. Başlangıç HCV-RNA düzeyi 6.65 ± 6.77 log IU/ml olarak saptandı. Tedavi bitimini takiben 12. haftada kontrole gelen tüm hastaların HCV-RNA düzeyleri negatif olarak ölçüldü. Bu hastalarda tedaviyi kesmeyi gerektirecek herhangi bir yan etki gözlenmedi. **Sonuç:** Hepatit C virüsü enfeksiyonunda Glecaprevir/Pibrentasvir tedavi sonuçlarına ilişkin Türkiye'den bir merkezin gerçek yaşam verileri bildirilmiştir. Sonuç olarak, yüksek tedavi başarısı ve düşük yan etki profiline sahip ikinci kuşak ilaçlar ile kronik hepatit C virüsü enfeksiyonunda eradikasyon mümkün gözükmektedir.

Anahtar kelimeler: Kronik hepatit C, güncel tedavi, kalıcı virolojik yanıt

Background and Aims: Direct-acting antiviral combinations have been shown to be highly effective in reducing the burden of chronic hepatitis C virus infection in clinical studies and are recommended by the European Association for the Study of the Liver treatment guidelines. We aimed to present the results of the Glecaprevir/Pibrentasvir treatment regimen used in the current treatment of chronic hepatitis C virus infection, which is one of the most important health problems in our center. **Materials and Methods:** This study included 47 patients who were diagnosed with chronic hepatitis C virus infection and were given Glecaprevir/Pibrentasvir treatment for 8 weeks and completed the treatment at the gastroenterology clinic of Atatürk University Research Hospital. Demographic and laboratory data of the patients were evaluated based on age, gender, hepatitis C virus subtype, and HCV-RNA level. HCV-RNA levels at treatment initiation, week 12, and end of treatment were recorded for patients who completed treatment. The HCV-RNA level at week 12 post-treatment was used to assess sustained virologic response. **Results:** The mean age of 47 patients receiving Glecaprevir/Pibrentasvir treatment was 57.64 ± 15.71 years, 20 (42.62%) were female and 27 (57.4%) were male. The initial HCV-RNA level was determined as 6.65 ± 6.77 log IU/ml. HCV-RNA levels of the patients who came for follow-up at the end of treatment 12th week were measured as negative. No side effects that would cause discontinuation of treatment were observed in these patients. **Conclusion:** Real-life data on the Glecaprevir/Pibrentasvir treatment protocol in hepatitis C virus infection have been reported. As a result, eradication of chronic hepatitis C virus infection seems possible with second-generation drugs with high treatment success and low side effect profiles.

Key words: Chronic hepatitis C, current treatment, sustained virological response

GİRİŞ

Hepatit C virüsü (HCV), siroz, dekompanse karaciğer hastalığı ve hepatoselüler karsinoma (HCC) ile sonuçlanan ilerleyici karaciğer hasarıyla birlikte akut ve kronik hepatite neden olabilen hepatot-

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ropik bir RNA virüsüdür. 2016 yılında Dünya Sağlık Örgütü (DSÖ), bir halk sağlığı tehdidi olarak HCV enfeksiyonunun 2030 yılına kadar ortadan kaldırılması çağrısında bulundu. Bazı ilerlemelere rağmen, 2020'de tahminen 57 milyon kişi HCV enfeksiyonuyla enfektedir ve yılda 300.000 kişi HCV'ye bağlı nedenlerle kaybedilmektedir. Direkt etkili antiviral (DEA) ilaçlarla tedavinin geliştirilmesi ve takiben tedavide ne derece etkin olduklarının gösterilmesi HCV eliminasyonunu gündeme getirse de eliminasyon için basitleştirilmiş ve genişletilmiş HCV taraması, tedaviye erişimin arttırılması ve HCV bulaşını önleme stratejilerine acilen ihtiyaç duyulmaktadır (1).

Direkt etkili antiviral tedavi kombinasyonlarının, klinik çalışmalarda kronik HCV enfeksiyon yükünü azaltmada oldukça etkili olduğu gösterilmiştir ve Avrupa Karaciğer Çalışmaları Derneği (EASL) tedavi kılavuzları tarafından da tavsiye edilmektedir (2). Böylece, tedavisi zor bir hastalığın hızlı, basit, güvenli ve etkin bir tedavisi sağlanmıştır. Yapılan çalışmalara göre kronik hepatit C tedavisinde hastaların > %90'ında kalıcı virolojik yanıt elde edilmesi ile HCC gelişme riskinde %70 azalma ve karaciğer kaynaklı ölüm ve karaciğer naklinde %90 azalma sağlanmıştır (3).

Biz de merkezimizde en önemli sağlık sorunlarından biri olan kronik HCV enfeksiyonunda güncel tedavide kullanılan Glecaprevir/Pibrentasvir (GLP/PIB) tedavi rejiminin sonuçlarını sunmayı amaçladık.

GEREÇ ve YÖNTEM

Bu çalışmaya, Atatürk Üniversitesi Araştırma Hastanesi Gastroenteroloji Kliniğinde tedavi naif kronik hepatit C enfeksiyonu tanısı ile 8 hafta Glecaprevir/Pibrentasvir (GLP/PIB) tedavisi verilen ve tedaviyi tamamlayan 47 hasta dahil edildi. Hastaların yaş, cinsiyet, HCV alt tipi, HCV-RNA düzeyi temelinde demografik, laboratuvar verileri değerlendirildi. HCV enfeksiyonuna bağlı karaciğer sirozu olan ve tedaviyi tamamlamayan hastalar çalışmaya alınmadı. Tedaviyi tamamlayan hastaların tedavi başlangıç, 12. hafta, tedavi sonu HCV-RNA düzeyleri kaydedildi. Tedavi sonrası 12. hafta HCV-RNA düzeyi kalıcı viral yanıt değerlendirilmesinde kullanıldı. Çalışma için Atatürk Üniversitesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu'ndan 29.03.2024 tarih ve 179 sayılı kararı ile onay alındı.

İstatiksel Yöntemler

Verilerin analizi için IBM SPSS 20.0 (SPSS Inc., Chicago, IL, ABD) programı kullanıldı. Araştırmanın istatistiksel analizinde sürekli değişkenler için ortalama ± standart sapma, kategorik değişkenler için frekans ve yüzde değerleri tanımlandı. Grupların genel özellikleri ve demografik özellikleri Frekans (Tanımlayıcı analiz: tek değişken için frekans analizi) analizi ile belirlendi. Verilerdeki bulgular Kolmogorov-Smirnov (K-S) testine göre normal dağılım göstermediğinden parametrik olmayan testler uygulandı. İkili karşılaştırmalarda, iki bağımsız grubun ortalama karşılaştırmaları için Bağımsız Örneklem t-Testi. Kategorik değişkenler arasındaki ilişkinin belirlenmesinde ki-kare testi kullanıldı. Çalışmanın tamamında $p \leq 0.05$ değeri istatistiksel olarak anlamlı kabul edildi.

BULGULAR

GLP/PIB tedavisi alan 47 hastanın yaş ortalaması 57.64 ± 15.71 olup, 20'si (%42.62) kadın, 27'si (%57.4) erkek idi. Başlangıç HCV-RNA düzeyi 6.65 ± 6.77 log IU/ml olarak saptandı. Hastaların 4'ü (%8.5) genotip 1a, 37'si (%78.7) genotip 1b, 3'ü (%6.4) genotip 3a, 3'ü (%6.4) genotip 3b idi. Hastaların tamamına GLP/PIB tedavisi verildi. 12. hafta sonu takibe gelen hastaların HCV-RNA düzeyleri negatif olarak ölçüldü. Bu hastalarda tedaviyi kesmeyi gerektirecek herhangi bir yan etki gözlenmedi. Kalıcı virolojik cevap sağlanan hastala-

Tablo 1 Hastaların genel özellikleri

		N = 47
Yaş	**Ortalama ± SS (min - max)**	57.64 ± 15.71 (29 - 88)
Cinsiyet	Kadın n (%)	20 (42.62)
	Erkek n (%)	27 (57.4)
HCV alt tipi	Tip 1a n (%)	4 (8.5)
	Tip 1b n (%)	37 (78.7)
	Tip 3a n (%)	3 (6.4)
	Tip 3b n (%)	3 (6.4)
Başlangıç HCV RNA (log IU/ml)	Ortalama ± SS (min - max)	6.65 ± 6.77 (3.43-7.38)
12. Hafta HCV RNA (log IU/ml)	Ortalama ± SS (min - max)	0 ± 0 (0 - 0)
Tedavi sonrası takip süresi	Ortalama ± SS (min - max)	41.26 ± 29.90 (12 - 136)

rın tedavi sonrası takiplerinde, HCV-RNA'nın en uzun süre negatif bulunduğu zaman noktası 136. haftada kaydedildi. Tedavi sonrası ortalama takip ve HCV-RNA ölçüm süresi 41.26 ± 29.90 hafta idi (Tablo 1).

TARTIŞMA

Kronik HCV enfeksiyonu, tüm dünyada karaciğer ilişkili ölümlerin önde gelen sebeplerinden biridir ve birçok ülkede karaciğer nakline gidişin birincil nedenidir. HCV enfeksiyonu prevalansı bazı ülkelerde hala yüksektir ve bu ülkelerde, güvenli ve etkili tedavi seçeneklerine erişim önemlidir. Glecaprevir/Pibrentasvir (GLE/PIB), çeşitli hasta popülasyonlarında HCV için kılavuzlarda önerilen, güvenli ve etkili bir tedavi seçeneğidir, nonsirotik vakalarda 8 hafta uygulanmaktadır. Antiviral tedavinin temel amacı virüsü yok etmektir. Son yıllarda, pangenomik özelliklere sahip ve çok iyi tolere edilebilen yeni ve daha etkili DEA ilaçların kullanımı hızla artmıştır. Bu ilaçlar, hepatit C tedavisinde kalıcı virolojik yanıt oranlarını %100'e kadar artırabilir. Ayrıca, bu ilaçlar daha kısa tedavi süreleri ve daha az yan etki ile yeni tedavi seçenekleri sunmaktadır (4,5).

Ülkemizde yaklaşık 700 000 HCV hastası olduğu tahmin edilmektedir. HCV'nin spesifik yapısal olmayan proteinlerini hedef alan ve böylece viral replikasyonu ve enfeksiyonu bozan direk etkili antiviral ilaçların piyasaya sürülmesi ile HCV enfeksiyonu tedavisinde devrim gerçekleşmiştir. Son derece etkili, iyi tolere edilen, tamamen oral olarak uygulanan bu ajanlar HCV ile enfekte hastaların büyük çoğunluğu için tercih edilen tedavi yöntemi olmuştur. Kronik hepatit C hastalarında antiviral tedavinin amacı, tedavinin tamamlanmasından 12 hafta sonra serumda saptanamayan HCV-RNA seviyesi olarak tanımlanan kalıcı virolojik yanıtın elde edilmesidir. Kalıcı virolojik cevap sağlandığı zaman karaciğer sirozu ve hepatoselüler karsinom gelişmesi önlenmiş olacaktır. Tedavi rejimi seçiminde, HCV genotipi siroz varlığı, tedavi geçmişi gibi parametreler dikkate alınmalıdır. Pangenotipik HCV tedavi rejimlerinin ortaya çıkmasıyla birlikte, tedavi öncesi HCV genotip tayini gereklilik olmaktan çıkmıştır. Bu nedenle direkt etkili antiviral ilaçlar genotip tayini yapılmadan kullanılabilir (4,6,7).

Türkiye'de Hepatit C virüsü (HCV) prevalansı yaklaşık %1 olup, geleneksel olarak genotip 1 baskın tiptir. Ancak bölgede artan insan göçü hareketliliği enfeksiyonun epidemiyolojisini etkilemektedir. Genotip 1b baskınlığının devam etmesine rağmen bölgemizde HCV genotiplerinin dağılım ve prevalansının esas olarak göç ve intravenöz ilaç kullanımı gibi geleneksel olmayan risk faktörlerine sahip hastaların sıklığının artması nedeniyle değiştiğini göstermiştir (8). HCV enfeksiyonu, ülkemizde olduğu gibi Avrupa'da önemli bir halk sağlığı sorunudur ve artan düzeyde karaciğere bağlı morbidite ve mortaliteye neden olmaktadır. Hem ABD hem de Avrupa'daki genotipik dağılıma benzer şekilde bizim çalışmamızda da hastaların büyük çoğunluğu genotip 1 idi. Genotip 1 varlığının daha şiddetli karaciğer hastalık gelişme riski ve daha sık hepatoselüler kanser gelişimiyle ilişkili olabileceği çeşitli çalışmalarda gösterilmiştir (9,10).

Kronik hepatit C, hepatik ve ekstrahepatik belirtileri olan sistemik bir hastalıktır ve HCV ile enfekte hastalarda enfekte olmamış kişilere kıyasla daha yüksek morbidite ve mortaliteye neden olmaktadır. Özellikle uyuşturucu kullananlar olmak üzere riskli gruplarda tarama yapılarak enfekte kişilerin tedavi edilmesi bu nedenle önemlidir. Ancak dirençle ilişkili mutasyonlar az sayıda hastada bu tedavilerin başarısız olmasına neden olabilir. Ayrıca antiviral tedavinin yüksek maliyeti nedeniyle hastaların bu ilaçları planlandığı şekilde kullanması önemlidir (11-14).

Çalışmamızda karaciğer siroz bulgusu olmayan tedavi naif hastalarda, EASL kılavuzunun basitleştirilmiş tedavi önerileri doğrultusunda pangenotipik Glecaprevir/Pibrentasvir (GLE/PIB) tedavisi 8 hafta uygulanmıştır. Böylece Erzurum ve çevresindeki kronik hepatit C hastalarındaki kalıcı virolojik yanıt oranının değerlendirilmesi amaçlanmıştır. Çalışmamız bulguları literatürdeki diğer çalışmaların bulgularına benzer şekildeydi. Bu çalışma ile tedavi naif, siroz bulgusu olmayan kronik hepatit C hastalarının tedavisinde GLE/PIB kombinasyon tedavisi ile %100 viral yanıt elde edilmiştir.

Bu çalışmada HCV enfeksiyonunda GLE/PIB tedavi protokolüne ait gerçek yaşam verileri bildirilmiştir. Sonuç olarak, yüksek tedavi başarısı ve düşük yan etki profiline sahip ikinci kuşak DEA ilaçlar ile kronik HCV enfeksiyonunda eradikasyon mümkün gözükmektedir. Çalışmamız ile GLE/PIB tedavisinde elde edilen kalıcı virolojik yanıt sonrası uzun süreli takipte bu yanıtın kalıcılığı da gösterilmiştir.

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ORIGINAL ARTICLE

Effects of malnutrition on quality of life in inflammatory bowel disease

İnflamatuvar bağırsak hastalığında malnütrisyonun yaşam kalitesi üzerine etkisi

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Background and Aims: In the course of inflammatory bowel diseases, malnutrition is a common condition for both the disease itself and some other reasons, such as the drugs used. Malnutrition can also lead to an increase in patients' risk of morbidity and mortality, an increase in treatment costs and impairment in quality of life. Therefore, early detection, treatment and determination of the risk factors for malnutrition are important for inflammatory bowel diseases patients. In our study, we aimed to determine the frequency of malnutrition, the effects of malnutrition on the overall quality of life, and the demographic, clinical and laboratory features of patients with inflammatory bowel diseases. **Materials and Methods:** Patients diagnosed with inflammatory bowel diseases who were admitted to Gastroenterology Outpatient Clinic between 2020 and 2021 were screened for the risk of malnutrition by MUST score. The overall quality of life of the patients was investigated using the EQ-5D index. **Results:** The risk of malnutrition was high in 11% of the patients in the Chron's disease group and in 10% of the patients in the ulcerative colitis group. In general quality of life evaluation, EQ-5D index was 0.83 ± 0.16 and EQ-5D VAS score was 63.75 ± 19.88 in the Chron's disease group; in the ulcerative colitis group, the EQ-5D index was 0.81 ± 0.19 and the EQ-5D VAS score was 67.99 ± 22.09, and when both groups were compared in terms of general quality of life, no statistically significant difference was observed (p = 0.355, p = 0.202, respectively). When the remission and activation groups of patients diagnosed with Crohn's and ulcerative colitis were compared in terms of malnutrition and general quality of life, no statistically significant difference was found between both groups (activation and remission). **Conclusion:** No significant correlation was found with the activation status of the patients, their malnutrition and general quality of life. Evaluation of weight status, nutritional status and general quality of life in inflammatory bowel diseases patients in polyclinics gives us the chance to prevent possible malnutrition and deterioration of general quality of life during the course of the disease with prophylactic measures. Considering the effect of malnutrition on the prognosis of diseases, evaluation of inflammatory bowel diseases patients in terms of malnutrition is very important.

Key words: Inflammatory bowel diseases, malnutrition, quality of life

Giriş ve Amaç: İnflamatuvar bağırsak hastalıkları seyrinde, hem hastalığın kendisinden hem de kullanılan ilaçlar gibi bazı nedenlerden dolayı malnütrisyon sık görülen bir durumdur. Malnütrisyon ayrıca hastaların morbidite ve mortalite riskinde artışa, tedavi maliyetlerinde artışa ve yaşam kalitesinde bozulmaya neden olabilir. Bu nedenle inflamatuvar bağırsak hastalığı olanlar için erken teşhis, tedavi ve malnütrisyona ilişkin risk faktörlerinin belirlenmesi önemlidir. Çalışmamızda inflamatuvar bağırsak hastalığı olanlarda malnütrisyon sıklığını, malnütrisyonun genel yaşam kalitesine etkilerini, demografik, klinik ve laboratuvar özelliklerini belirlemeyi amaçladık. **Gereç ve Yöntem:** 2020-2021 yılları arasında Gastroenteroloji Polikliniği'ne başvuran inflamatuvar bağırsak hastalığı tanısı alan hastalar MUST skoru ile malnütrisyon riski açısından tarandı. Hastaların genel yaşam kalitesi EQ-5D indeksi kullanılarak araştırıldı. **Bulgular:** Crohn hastalığı grubundaki hastaların %11'inde, ülseratif kolit grubundaki hastaların ise %10'unda malnütrisyon riski yüksekti. Genel yaşam kalitesi değerlendirmesinde Crohn hastalığı grubunda EQ-5D indeksi 0.83 ± 0.16, EQ-5D VAS skoru 63.75 ± 19.88; ülseratif kolit grubunda EQ-5D indeksi 0.81 ± 0.19 ve EQ-5D VAS skoru 67.99 ± 22.09 olup, her iki grup genel yaşam kalitesi açısından karşılaştırıldığında istatistiksel olarak anlamlı bir fark gözlenmedi (sırasıyla p = 0.355, p = 0.202). Crohn hastalığı ve ülseratif kolit tanısı alan hastaların remisyon ve aktivasyon grupları malnütrisyon ve genel yaşam kalitesi açısından karşılaştırıldığında her iki grup arasında (aktivasyon ve remisyon) istatistiksel olarak anlamlı fark bulunmadı. **Sonuç:** Hastaların aktivasyon durumları, malnütrisyon ve genel yaşam kalitesi arasında anlamlı bir ilişki bulunamadı. İnflamatuvar bağırsak hastalığı hastalarında polikliniklerde kilo durumu, beslenme durumu ve genel yaşam kalitesinin değerlendirilmesi, profilaktik önlemlerle hastalığın seyri sırasında olası malnütrisyon ve genel yaşam kalitesinin bozulmasını önleme şansı vermektedir. Malnütrisyonun hastalıkların prognozu üzerindeki etkisi dikkate alındığında inflamatuvar bağırsak hastalığı hastalarının malnütrisyon açısından değerlendirilmesi oldukça önemlidir.

Anahtar kelimeler: İnflamatuvar barsak hastalıkları, malnütrisyon, yaşam kalitesi

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INTRODUCTION

Inflammatory bowel diseases (IBD) are chronic diseases that progress with attack and remission periods, are accompanied by abdominal pain, diarrhea, and weight loss, and deeply affect the family, social and quality of life of the patients (1). The incidence of it is currently increasing in tandem with socioeconomic development.

Nutritional disorders are common in IBD patients, and malnutrition can even occur in patients who are in remission (2). The causes of malnutrition in IBD patients are multifactorial and are known to be caused by complex pathophysiological processes (3). As examples of these pathophysiological processes, reduced food intake due to symptoms such as abdominal pain, diarrhea, and anorexia, inadequate absorption, previous bowel resection, and metabolic stress caused by steroid therapy and inflammation may be shown (3). Malnutrition is a factor that contributes to mortality and morbidity in acute and chronic gastrointestinal system diseases. Recent studies have found a relationship between malnutrition and low quality of life (4).

Quality of life (QOL) is a multidimensional indicator that reflects functional status, emotional state, well-being and welfare level. The measurement of quality of life is determined by how patients perceive their well-being. QOL is the current clinical parameter that evaluates the general condition of patients and the benefits of new treatment strategies (4). This study aims to investigate the connection between IBD and malnutrition, and the effects of malnutrition on the quality of life of these patients.

MATERIALS and METHODS

Patient Group

This observational study was conducted with a cohort of 162 IBD patients who underwent follow-up at the gastroenterology clinic between 2020 and 2021. IBD patients were evaluated in two groups, 82 patients in the ulcerative colitis (UC) group and 80 patients in the Crohn's disease (CD) group. The patients' age, gender, harmful habits, age at disease onset, history and number of gastrointestinal operations, history of appendectomy, number of visits to routine check-ups in the last 2 years, number of hospitalizations, and number of activations were questioned. Complete blood count, erythrocyte sedimentation rate, C-reactive protein, prealbumin, vitamin B12, vitamin D and ferritin levels were examined in patients in terms of inflammation and nutritional status.

Evaluation of Disease Characteristics

In the UC and CD groups, the location of disease involvement was determined according to the Montreal classification (5). Disease activation and remission in UC patients were evaluated using the Mayo score. According to the Mayo score, clinical response was classified as complete or partial. Disease severity was categorized into remission (≤ 2), mild (3-9), moderate (6-10), and severe (11-12) based on this score (6). Crohn's patients were evaluated for activation using the Harvey-Bradshaw index (HBI). HBI is a test that is both simplified and easy to calculate, making it suitable for long-term follow-up and clinical use. In this test, 5 clinical parameters are questioned; general well-being of the patient, abdominal pain, number of defecations per day, palpable abdominal mass and complications (7).

Malnutrition and Quality of Life Assessment

MUST scoring was used in patients to evaluate malnutrition (8). MUST scoring was done in three steps. The initial step involved calculating the body-mass index (BMI) of the patients. Those with a BMI of 20 kg/m^2 and above were given 0 points, those with a BMI of 18.5 kg/m^2 - 20 kg/m^2 were given 1 point, and those with a BMI below 18.5 kg/m^2 were given 2 points. In the second step, involuntary weight loss

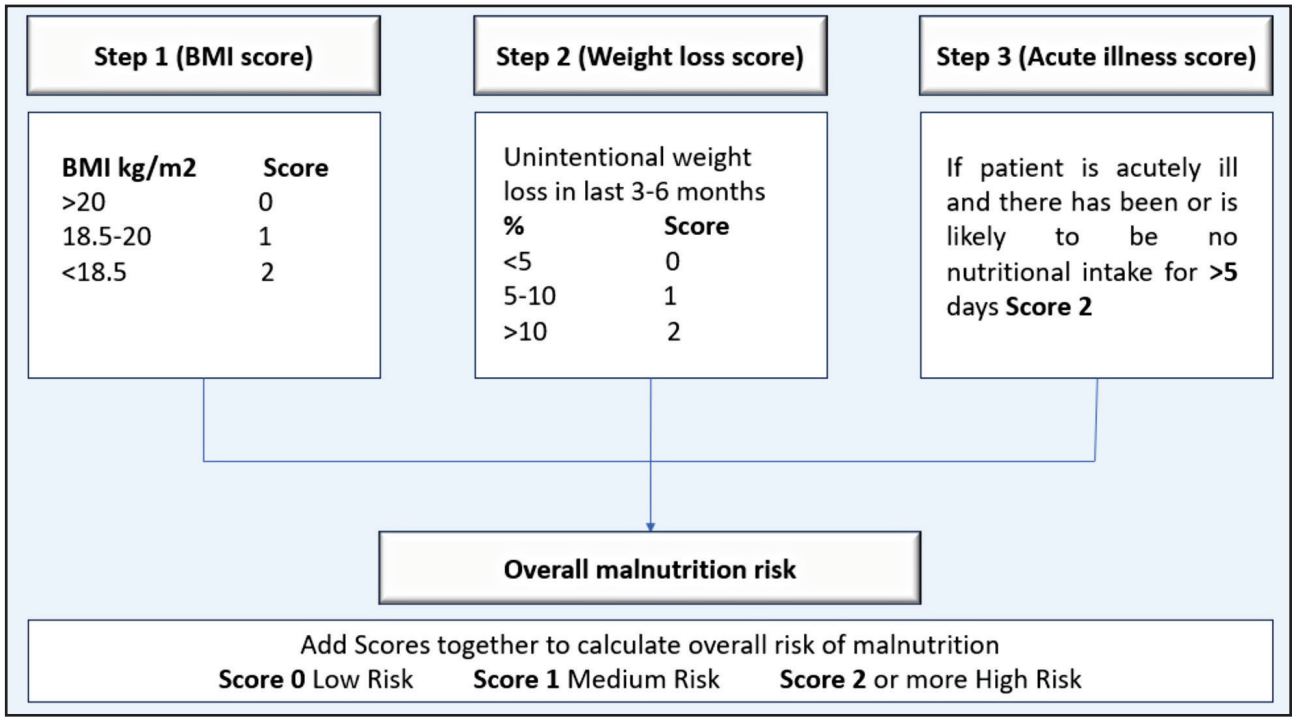

Figure 1 MUST score.

in the last 3-6 months was questioned. Those with weight loss below 5% of their body weight were given 0 points, those with weight loss between 5-10% were given 1 point, and those with weight loss over 10% were given 2 points. The evaluation of weight loss did not involve continuous measurements in hospital conditions, and the results were calculated by calculating the weight of the patients 3-6 months ago. In the third stage, if there was an acute illness, the presence of a lack of food intake for longer than 5 days was assessed at 2 points. By combining the scores given in three steps, a value of between 0 and 6 points was determined.

Quality of life was measured using the visual analog scale (EQ-5D-VAS) instrument (9). The EQ-5D is a widely used, validated questionnaire that includes five health dimensions (mobility, self-care, daily activities, pain/discomfort, and anxiety/depression); and each dimension contains three levels: no difficulty, some difficulties, and extreme difficulties. The Visual Analogue Scale (VAS) is a tool that allows respondents to assess their own health status using a vertical scale of 20 cm. The health status with the top 100 points is the best, and the health status with the bottom zero points is the worst.

Statistical Analysis

The demographic data obtained from the study are presented with frequency and percentage distributions. In addition, an independent samples t-test was used to compare numerical variables obtained from patients according to study groups, and chi-square analysis was used to compare categorical variables. Analyses were carried out using the SPSS 22.0 program. A significance level of $p < 0.05$ was selected.

Ethics

Ethics committee approval for the study was received from the Gaziantep University Clinical Research Ethics Committee (05.02.2020, no: 2020/22).

RESULTS

Demographic Characteristics

The female to male ratio in the CD group was 24/56 and the mean age was 38.28 ± 12.74 years. The UC group had a female-male ratio of 42/40 and a mean age of 35.66 ± 13.38 years. Smoking was 65.9% in the CD group and 34.1% in the UC group. There was a statistically significant difference between Crohn's patients and UC patients with a history of appendectomy, with a difference of 25% and 2.49%, respectively ($p < 0.05$). The average number of GI operations in the last 2 years was 0.64 ± 0.89 in the CD group, and 0.21 ± 0.58 in the UC group and there was a statistically significant difference between the two groups ($p = 0.001$) (Table 1).

Disease Location and Severity

Laboratory data of the patients are shown in Table 2. Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) levels were found higher in CD group than UC group, and there was a statistically significant difference between the two groups (24.44 ± 27.03 mm/h vs 16.54 ± 15.17 mm/h, $p = 0.023$; 17.79 ± 38.56 mg/dl vs 8.12 ± 13.32 mg/dl, $p = 0.034$, respectively). The groups had no statistically significant differences in other parameters (Table 2).

Table 1 Demographic characteristics of patients.

	CD Group (n=80) n (%)	UC Group (n=82) n (%)	p
Smoking use	27 (65.9)	14 (34.1)	0.015
Alcohol use	8 (80)	2 (20)	0.046
Appendectomy	20 (%25)	2 (%2.4)	0.001
Number of GI operations	0.64 ± 0.89	0.21 ± 0.58	0.001
Disease age (years)	6.19 ± 3.89	6.04 ± 4.23	0.814
Number of policlinic visits in the last 2 years	9.49 ± 4.82	8.95 ± 5.60	0.515
Number of disease activations in the last 2 years	0.51 ± 0.97	0.80 ± 1.05	0.067
Number of hospitalizations in the last 2 years	0.35 ± 0.76	0.34 ± 0.63	0.938

CD: Chron's disease; UC: Ulcerative colitis; GI: Gastrointestinal.

Table 2 Laboratory parameters in both groups.

	CD (n = 80)	UC (n = 82)	p
WBC (/μL)	7221 ± 2516	7849 ± 3011	0.152
Hemoglobin (g/dl)	13.67 ± 1.92	14.01 ± 1.66	0.423
Platelets (/μL)	307202 ± 104723	278109 ± 92537	0.063
ESR (mm/s)	24.44 ± 27.03	16.54 ± 15.17	0.023
CRP (mg/dl)	17.79 ± 38.56	8.12 ± 13.32	0.034
Prealbumin (mg/dl)	26.20 ± 8.29	26.46 ± 8.00	0.842
Vitamin B12 (pg/ml)	234 ± 141	253 ± 108	0.334
Ferritin (ng/ml)	71.7 ± 174.6	76.9 ± 116.1	0.821
Vitamin D (ng/ml)	15.39 ± 8.69	16.04 ± 9.03	0.642

CD: Chron's disease; UC: Ulcerative colitis; WBC: White blood cells; ESR: Erythrocyte sedimentation rate; CRP: C-reactive protein.

Ileocolonic involvement was the majority of the cases in the CD group, with 17.5% ileal involvement, 11.2% colonic involvement, and 1.3 cases of upper GI involvement. Perianal disease was found in three patients with ileocolonic involvement and two patients with colonic involvement. According to the HBI score, 82.5% of Crohn's patients were in remission, while 17.5% had active disease. Left-sided UC was the most common form of disease among patients in the UC group, with 45.2% having it, followed by ulcerative proctitis at 28%, and extensive colitis at 26.8%. Remission was found to be in 78.05% of patients in the UC group by the Mayo score. Mild disease was prevalent among patients, with 12.20% having mild disease, 6.10% having moderate disease, and 3.65% having severe disease (Table 3).

Malnutrition and Quality of Life

The risk of malnutrition was high in 11% of the patients in the CD group and in 10% of the patients in the UC group. In general quality of life evaluation, EQ-5D index was 0.83 ± 0.16 and EQ-5D VAS score was 63.75 ± 19.88 in the CD group; in the UC group, the EQ-5D index was 0.81 ± 0.19 and the EQ-5D VAS score was 67.99 ± 22.09, and when both groups were compared in terms of general quality of life, no statistically significant difference was observed. ($p = 0.355$, $p = 0.202$, respectively) (Table 4). The comparison of malnutrition and general quality of life between the remission and activation groups of patients diagnosed with Crohn's and UC showed no statistically significant difference. Since MUST score values were always zero in patients diagnosed with UC in remission, a correlation calculation was not possible with this value, along with other data.

DISCUSSION

The relationship between nutrition and IBD is quite complex. Although diet, which is the source of antigens in the intestinal lumen, is thought to play

Table 3 Disease location and severity in both groups.

	CD (n = 80)	n (%)	UC (n = 82)	n (%)
Disease location	Upper GI	1 (1.3)	Ulcerative proctitis	23 (28)
	Ileal	14 (17.5)	Left-sided UC	37 (45.2)
	Ileocolonic	56 (70)	Extensive	22 (26.8)
	Colonic	9 (11.2)		
Disease severity	Remission	66 (82.5)	Remission	64 (78.05)
	Active disease	14 (17.5)	Mild disease	10 (12.20)
			Mild-moderate disease	5 (6.10)
			Severe disease	3 (3.65)

CD: Chron's disease; UC: Ulcerative colitis; GI: Gastrointestinal.

Table 4 Malnutrition and quality of life measure results.

		CD (n = 80)	UC (n = 82)	P
EQ-5D index		0.83 ± 0.16	0.81 ± 0.19	0.355
EQ-5D VAS score		63.75 ± 19.88	67.99 ± 22.09	0.202
MUST score, n (%)	Low risk	60 (%75)	64 (%78)	0.900
	Moderate risk	11 (%14)	10 (%12)	
	High risk	9 (%11)	8 (%10)	

CD: Chron's disease; UC: Ulcerative colitis.

an important role in the immunopathogenesis of IBD, it is not clear whether the primary effect in the etiology of IBD is caused by antibodies against antigens in the diet or whether it occurs secondary to intestinal inflammation. Another important point is that malnutrition or deficiency of certain nutrients is frequently observed in these patients. Therefore, while the nutritional regimen plays a role in the normalization of the patient with malnutrition and the treatment of active disease, on the other hand, it may be a risk factor in the etiology of IBD (10,11).

The aim of our study was to highlight the prevalence of malnutrition among IBD patients and how it affects their quality of life. In our study, we aimed to determine the prevalence of IBD patients at risk of malnutrition. We found that 10.5% of all our patients were at high risk. Csontos AA et al., in their study with 173 outpatient IBD patients, found a high risk of malnutrition in 21.4% of the patients (12). In the study of Rahman et al., 154 IBD patients were evaluated and a high malnutrition risk of 29.9% was detected (13). In our study, we found that this rate was relatively lower. We think that the reason why malnutrition is less common in our patients is because they regularly follow-up and receive the necessary treatment and nutritional support quickly in case of any clinical deterioration. Additionally, the low number of active patients included in our study may have contributed to this outcome.

The EQ-5D index was used to investigate the impact of patients' malnutrition status on their quality of life in our study. In this evaluation, no significant effect was detected between the patient groups (UC, CD) or the activation status of these patients on the quality of life. In the study conducted by Valentini L et al., although a significant relationship was found between quality of life and disease activation, no relationship was found with malnutrition (14).

A significant difference was detected between the CD and UC groups in the GI surgery history of our patient groups. According to literature, 50% of Crohn's patients may require surgical intervention within the first 10 years of their disease. Depending on the location of the disease, the lifetime risk of undergoing surgery is reported to be approximately 70-80% (15). When we look at the number of attacks in the last 2 years, Crohn's patients were significantly more prevalent. According to this data, Crohn's patients tend to have a more noisy clinical course than UC patients.

According to the patients' GI surgery history, it was determined that a significant portion of Crohn's patients had undergone an appendectomy. While 20 percent of the 80 Crohn's patients had a history of appendectomy, only two out of the 82 UC patients had a history of appendectomy. In a study by Roland E et al. on 212,218 appendectomy patients, the risk of Crohn's disease was increased in patients who underwent appendectomy. This risk persists even 20 years after an appendectomy. According to this relationship, the mechanism behind the development of appendicitis and Crohn's disease is similar (16). Previous studies have shown that appendectomy has a protective effect on UC patients. In the cohort study conducted by Andersson et al., including 212 693 cases, the risk of developing UC was reported to be reduced by 55% (17). In our study, we found that the significant difference between appendectomy history and patient groups was consistent with those observed in the aforementioned studies.

The study has some limitations. The MUST score, which we used in our study to determine the risk of malnutrition, is a screening test recommended by ESPEN, but it is not a diagnostic test. The MUST score is lacking in certain areas. For example, the presence of a prediction that food intake will not be possible for the next 5 days due to acute illness puts the patient in the high-risk group with a score

of 2. Another limitation of the study is the lack of a control group.

Evaluating the weight status, nutritional status and general quality of life of IBD patients in outpatient clinics gives us the chance to prevent possible malnutrition and deterioration in the general quality of life that may occur in these patients during the course of the disease with prophylactic measures. Malnutrition may be a disease-triggering factor in IBD patients. Affecting the general quality of life could lead to a decrease of patients' belief in recovery and compliance with medical treatment. This study may give physicians an idea in terms of timely detecting the level of malnutrition and its effects on quality of life in IBD patients in the future, and providing prophylactic measures and nutritional support.

Ethics: *Ethics committee approval for the study was received from the Gaziantep University Clinical Research Ethics Committee (05.02.2020, no: 2020/22).*

Conflicts of Interest: *In compliance with the ICMJE uniform disclosure form, all authors declare the following: The authors declare no conflicts of interest.*

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ORIGINAL ARTICLE

Management of proximal migrated biliary stents: Single center experience

Proksimale migrate biliyer plastik stentlerin yönetimi: Tek merkez deneyimi

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Background and Aims: Migration in biliary stents is one of the expected complications of biliary stenting. Since proximally migrated biliary stents may result in serious complications, management of proximally migrated biliary stents are important. In this study we aimed to evaluate our patients with proximally migrated biliary stents and review current medical literature. **Materials and Methods:** Patients with proximally migrated biliary stents who had endoscopic retrograde cholangiopancreatography application at Health Sciences University, Adana City Training and Research Hospital, Department of Gastroenterology between September 2017- November 2022 were included in the study. Patients' files and electronic database of our hospital were screened and evaluated retrospectively. Patients' clinic and laboratory data were recorded. **Results:** The study included 57 patients. Mean age was 60.7 ± 14.5 (29-90) and 30 (52.6%) were male. Thirty four patients were asymptomatic other remaining patients presented with abdominal pain, jaundice, or fever. Fifteen (26.3%) patients had cholangitis and five patients had liver abscess during presentation. One patient died due to cholangitis associated with proximally migrated biliary stents. In 31 patients, proximally migrated biliary stents were removed successfully in our hospital. After stent removal, two patients had post-endoscopic retrograde cholangiopancreatography complications (post-endoscopic retrograde cholangiopancreatography pancreatitis and bleeding). Four patients had surgical intervention. In nine patients, stents were removed in external centers. In 13 patients, proximally migrated biliary stents could not be extracted. **Conclusions**: Proximal migration of biliary stents is an important complication of biliary stenting. Patients may be asymptomatic or symptomatic. Proximally migrated biliary stents may result in serious complications such as cholangitis, liver abscess and even death. Thus, early diagnosis and proper treatment are important in these patients. Proximally migrated biliary stents may be removed in most patients with endoscopic retrograde cholangiopancreatography.

Key words: Biliary stent, proximal migration, treatment

Giriş ve Amaç: Biliyer stentlerin migrasyonu beklenmeyen komplikasyonlardan biridir. Proksimale migre olan stentler ciddi komplikasyonlara yol açabileceğinden, yönetimleri önemlidir. Bu çalışmada proksimale migre stent saptadığımız hastalarımızı değerlendirmek ve güncel medikal literatürü gözden geçirmeyi amaçladık. **Gereç ve Yöntem:** Eylül 2017-Kasım 2022 tarihleri arasında Sağlık Bilimleri Üniversitesi Adana Şehir Eğitim ve Araştırma Hastanesinde endoskopik retrograd kolanjiopankreatografi işlemi yapılan hastalar çalışmaya alındı. Hastaların dosyaları ve hastane veri tabanı retrospektif olarak tarandı. Hastaların klinik ve laboratuvar verileri kaydedildi. **Bulgular:** Çalışmaya 57 hasta alındı. Ortalama yaş 60.7 ± 14.5 (29-90) ve 30 (52.6%) hasta erkek idi. Otuz dört hasta başvuru anında asemptomatik, diğer hastalarda ise karın ağrısı, sarılık veya ateş şikayetleri vardı. On beş (%26.3) hastada kolanjit ve beş hastada başvuru sırasında karaciğer apsesi mevcuttu. Bir hasta proksimale migre stent ile ilişkili kolanjit nedeniyle hayatını kaybetti. Otuz bir hastada proksimale migre stentler hastanemizde başarılı bir şekilde çıkarıldı. Stent çıkarılması sonrası iki hastada endoskopik retrograd kolanjiopankreatografi işlemi sonrası komplikasyon gelişti (Bir hastada post endoskopik retrograd kolanjiopankreatografi pankreatiti ve bir hastada kanama). Dört hastada cerrahi girişim yapıldı. Dokuz hastada migre olmuş stentler dış merkezde çıkarıldı. On üç hastada migre olmuş stentler çıkarılamadı. **Sonuç:** Proksimale migre olmuş biliyer stentler biliyer stentlerin önemli bir komplikasyonudur. Hastalar semptomatik veya asemptomatik olabilir. Proksimale migre olmuş biliyer stentler kolanjit, karaciğer apsesi ve hatta ölüme bile yol açabilirler. Bu nedenle erken tanı ve uygun tedavi önemlidir. Proksimale migre olmuş biliyer stentler endoskopik retrograd kolanjiopankreatografi işlemi ile çıkarılabilirler.

Anahtar kelimeler: Biliyer stent, proksimal migrasyon, tedavi

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INTRODUCTION

Biliary stents have been successfully and frequently applied modality to treat biliary obstructions and strictures for more than 40 years (1). Application of biliary stent in therapeutic endoscopic retrograde cholangiopancreatography (ERCP) is a great advance and revolution in the treatment of biliary diseases (2). Biliary stents are used to treat biliary obstructions which were caused by unextractable biliary stones, chronic pancreatitis, anastomotic strictures related to liver transplantation, benign biliary strictures after cholecystectomy, cholangiocarcinoma, pancreas cancer or other malign extrahepatic diseases and biliary stents were also used to treat postoperative biliary leaks (2,3). Indications of the procedure, selection of proper stent type, contraindications, complications, and management of complications must be known prior to biliary stenting (3). Complications of biliary stents are stent occlusion, stent migration, cholangitis, cholecystitis, perforation, and bleeding (4). Biliary stent migration is one of frequent complications of biliary stents (3,5). There are various reports with different results regarding the frequency of stent migration, risk factors and migration type (proximal or distal) in medical literature (3,5,6). Early diagnosis and proper treatment are important. ERCP is preferred treatment modality in the treatment of proximally migrated biliary stents (PMBS).

In this study we aimed to evaluate our patients with proximally migrated biliary stents and review current medical literature.

MATERIALS and METHODS

The Study was conducted in University of Health Sciences, Adana City Training and Research Hospital through a time frame of September 2017 and November 2022 and included consecutive patients with diagnosed with PMBS during ERCP.

Patients' presentations, demographics, indications for biliary stenting, time to migration, place where stent was placed, success of endoscopic treatment or other treatment modalities, complications of applied modality, laboratory data when migration was detected were recorded retrospectively.

Diagnosis of biliary stent migration was made if the stent was not seen through papillary orifice and fluoroscopic image of stent in biliary tract.

Retrieval of stent were defined as observation of stent removal after applied treatment modality in ERCP and no stent image on fluoroscopy. Failure of procedure was defined as failure to remove stent by stone extraction balloon, dormia basket, forceps, or snare.

Patients with lack data, metal or pig tail stent were excluded.

The study was approved by local ethic committee of Adana City Training and Research Hospital with decision no: 2023/2383.

This study was conducted in accordance with the principles of the Declaration of Helsinki.

Statistics

Statistical analysis was done using Statistical Package for the Social Sciences (SPSS) version 25 (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.). Continuous variables were expressed as mean ± standard deviation (SD) and categoric variables were expressed as frequency and percent [n (%)].

RESULTS

Six thousand one hundred fifty-two ERCP procedures were performed in our unit through September 2017-November 2022. Among them 57 patients had proximal migration of stent and were included in the study. Mean age was 60.7 ± 14.5 (29-90) and 30 (52.6%) were male. The most common indications of biliary stenting were choledocholit-

hiasis, benign biliary strictures and biliary leaks, respectively. In 38 (66.7%) patients, stents were placed in our hospital and in 19 (33.3%) patients' stents were placed in other hospital. Thirty-four patients were asymptomatic other remaining patients presented with abdominal pain, jaundice, or fever. Fifteen (26.3%) patients had cholangitis and 5 (8.8%) patients had liver abscess during presentation. Stents were migrated into choledochus in 52 patients, into intrahepatic bile ducts in 3 patients and into main hepatic duct in 2 patients. In 31 (54.3%) patients, PMBS were removed successfully in our hospital. Of these patients 27 (47.4%) patients PMBS retrieved in first ERCP procedure while four of them needed repeated ERCP procedures (three patients in 2 sessions and one patient needed 4 sessions). The most common treatment modality was balloon. Two patients had post-ERCP complications (post ERCP pancreatitis and bleeding). Four patients had surgical intervention. In 9 patients, stents were removed in external centers. All migrated stents in other locations except choledochus (5 patients %8.7) were successfully removed. In 13 patients stent could not be extracted. Four of them had pancreas carcinoma, 2 of them and 5 others died during follow up unrelated to stent migration. Only one patient died related to PMBS associated cholangitis. Five patients had lost to follow-up. Patient demographics, stent indications, place stent placed, properties of stent and applied treatments are shown on Table 1. Patients' laboratory data are shown on Table 2.

Table 1 Patient demographics, stent indications, stent placement site, properties of stent and applied treatments.

Age (years old)	60.7 ± 14.5 (29-90)
Sex (Male/Female)	30/27
Stent Indication	
Choledocholithiasis	39 (68.4%)
Benign biliary strictures	3 (5.3%)
Biliary leaks	5 (8.8%)
Pancreas Ca	4 (7%)
Cholangiocarcinoma	1 (1.8%)
Other	5 (8.8%)
Time to stent migration (Months)	13.7 ± 18.8 (1-67)
Presentation	
Asymptomatic	34 (59.6%)
Abdominal pain	20 (35.1%)
Jaundice	8 (14%)
Fever	6 (10.5%)
Cholangitis	
Present	15 (26.3%)
Absent	42 (73.7%)
Liver abscess	
Present	5 (8.8%)
Absent	52 (91.3%)
Applied treatment n (%)	
Balloon	28 (49.1%)
Basket	2 (3.5%)
Forceps	1 (1.8%)
Surgical intervention	4 (7%)
External center	9 (15.8%)
Failed extraction	13 (22.8%)
Stent removal at first ERCP	
Yes	27 (47.4%)
No	4 (7%)
Procedure related complications	
Bleeding	1 (1.8%)
Pancreatitis	1 (1.8%)

DISCUSSION

Nowadays, endoscopic biliary stenting by ERCP in the management of biliary obstructions caused by various etiologies is frequently used modality (4). There are various stent types exist. Plastic stents are widely used, with advantages of low cost, ease of replacement and its usability for benign diseases (3). The plastic stents have flaps close to each end to prevent migration, but unfortunately these flaps may not prevent proximal or distal migration. Proximal migration is a relatively rare complication and may result in serious situations such as cholangitis and liver abscess (7).

Table 2 Patient's laboratory data at presentation.

WBC (10^3 /µl)	10.50 ± 5.93 (3.8 - 38.9)
Hb (g/dL)	12.55 ± 1.9 (8.2 - 16.5)
PLT (10^3/µl)	270.36 ± 106.45 (97 - 532)
INR	1.05 ± 0.11 (0.89 - 1.3)
Glucose (mg/dl)	129.5 ± 51.3 (75 - 300)
AST (U/L)	77.6 ± 146.6 (15 - 717)
ALT (U/L)	60.1 ± 92.6 (8 - 432)
ALP (U/L)	213.8 ± 201.4 (44 - 890)
GGT (U/L)	204.7 ± 208.1 (13 - 1027)
Alb (g/L)	35.3 ± 6.8 (20.9 - 44.7)
T. Bil (mg/dL)	1.66 ± 2.5 (0.3 - 17.2)
D. Bil (mg/dl)	0.7 ± 1.5 (0.1 - 9.4)
Urea (mg/dL)	35.96 ± 23.9 (9.3 - 165)
Cr (mg/dL)	0.9 ± 0.9 (0.37 - 7.27)
Na (mmol/L)	138.4 ± 3.5 (128 - 148)
K (mmol/L)	4.5 ± 0.5 (3.54 - 5.62)
CRP (mg/L)	58.42 ± 90.1 (0.- 358)

The frequency of proximal migration of stents into the bile duct has been reported to be 1.7 - 10% (8-10). Since patients who were stented in other centers, and we cannot give exact stent migration rate in our study.

In a study by Taj et al, included 5700 ERCP procedures performed on 4800 patients, 1229 patients (21.6%) had biliary stenting. Choledocholithiasis was the most common indication for biliary stenting. In 51 patients (4.16%) stent migration occurred and 39 of them (76.4%) stents were migrated proximally. All patients were successfully treated by ERCP, in 45 (88.2%) patients stents were removed in first session and in 6 (11.8%) patients needed repeated sessions. There was no complication related to the procedure (11). In a study by Katsinelos et al, included 51 patients, reported that in 21 patients (41.2%) biliary stents migrated proximally while in 30 patients (58.8%) biliary stents were migrated distally. Fifteen out of 21 patients (71.4%), proximally migrated stents were successfully removed by ERCP (12).

In a study by Arhan et al, stent migration was observed in 45 (8.58%) out of 524 biliary stent placements. Twenty four (53.3%) of them were PMBS. All PMBS were successfully removed using stone extraction balloon ± biopsy forceps (5).

The mechanism for the migration of biliary stents is not clear. Studies reported that patient, endoscopic, or stent related factors may predispose to stent migration. Benign etiology, common bile duct dilation, prior sphincterotomy, stenosis and location of stenosis, type of stent, length and diameter, duration of stent, biliary dilatation are defined risk factors for MBS (6,6,13). However, presence of multiple stent placement has decreased the risk of proximal stent migration (5).

Patients with PMBS may present as asymptomatic or symptomatic such as jaundice, abdominal pain, fever, nausea, and vomiting. Migrated biliary stents may result in serious complications. Some patients may present with cholangitis or liver abscess (11). In our study 34 (58.6%) of patients were asymptomatic, 21 (36.2%) of patients had abdominal pain, 8 (13.8%) of patients had jaundice and 6 (10.3%) of patients had fever during admission to our hospital. Sixteen (27.6%) of our patients had cholangitis and 5 (8.6%) of our patients had liver abscess during presentation.

Diagnosis of PMBS often was made if the stent was not seen through papillary orifice and fluoroscopic image of stent in biliary tract (6). Diagnosis of migrated biliary stents may also be made by direct graphy, computed tomography, magnetic resonance, or magnetic resonance cholangiopancreatography.

Early diagnosis and proper treatment of PMBS are important. Stents may be retrieved by ERCP, interventional radiologic techniques or surgery. If ERCP failed to remove PMBS, in this situation,

stent removal may be performed by interventional radiologic techniques or surgical methods which are more invasive (10,12,14).

ERCP is first line treatment modality to remove PMBS (5,11,15). The experience of the endoscopist and the presence of equipment to be used in stent removal as well as patient-related factors (i.e., biliary dilatation, strictures, depth of stent migration, distal stent impaction) are important in the choice of retrieval technique for the treatment of PMBS (15).

Numerous techniques to retrieve a PMBS have been described. Commonly used endoscopic devices include stone extraction balloon, baskets, forceps, snares, and Soehendra stent retriever (5,6,10,11,14). Most or all PMBS can be retrieved endoscopically by using these devices (5,6,11,14). The placement of an additional stent alongside an irretrievable stent is a satisfactory alternative to retrieval (15). To choose proper treatment method, some factors should be considered. In patients with advanced biliary dilatation, stone extraction balloon may fail to extract PMBS, in these patients, basket may be another option, while using rat tooth forceps, forceps may harm bile duct wall and may cause bleeding and bile duct damage. To prevent damage to bile duct wall, procedure must be performed under fluoroscopy when using forceps. In case of failure with balloon or basket, balloon biliary sphincteroplasty may help to increase the success rate (16). Rarely, cholangioscopy can be used to remove PMBS (17,18). However, cholangioscopy is not available even in many experienced centers.

In our study, in 27 (47.4%) of our patients' migrated stents were extracted in first ERCP procedure, 4 (7%) of patients needed repeated ERCP procedures (3 patients in 2 sessions and one patient needed 4 sessions). Twenty-eight (49.1%), 2 (3.5%), and one (1.75%) patient were treated with balloon, basket, and biopsy forceps, respectively. Four (7%) patients were treated with surgical intervention. In 9 patients, stents were removed in external centers. In 13 out of 52 patients who had PMBS in ductus choledochus, PMBS could not be extracted, and another stent was placed. Of these patients 7 patients died during follow-up unrelated to PMBS and only one patient died related to cholangitis. Five patients had lost to follow-up.

In our study we have observed migrated stents in locations other than ductus choledochus in 5 patients. In 4 patients (7%) stents were successfully retrieved by ERCP. In only one patient who had migrated stent into intrahepatic bile duct, stent could not be retrieved and required surgical treatment. We think that due to low number of our cases, it would not be appropriate to comment on the effect of stent location to stent removal.

The rate of occurrence of successful endoscopic retrieval of a PMBS has been reported as 71.4-100% (5,12). In our study success rate of stent removal was low (54.47% in our center, 70% if we include external centers). Low success rates may be related with lack of stent removal tool, lack of large balloon application, lack of cholangioscope, inexperienced endoscopists and failure to follow up patients during pandemics. Twenty six (45.6%) of our patients were diagnosed during pandemics. In our study, since some ERCP procedures were performed in external center, lack of long-term follow-up of some patients who had biliary stenting in our hospital, we could not give the exact rate of PMBS.

Limitations of our study are retrospective study and single-center design. Another restriction of our study is lack of balloon sphincteroplasty, lack of the use of Soehendra stent retriever and cholangioscopy, which may lead to low success rate of PMBS removal.

In conclusion, PMBS are one of the important complications that may be seen in patients with

biliary stent placement. PMBS's may be removed endoscopically in most patients. Advanced ERCP methods in stent removal should be known if the stent cannot be removed, we think that in case of failed stent removal attempts, placement of a new stent and referral of patients to more experienced centers may be appropriate way.

Ethics Committee: *This study protocol was approved by Ethics Committee of Adana City Training and Research Hospital with decision no: 2383 dated 02.02.2023. The study was complied with The World Medical Association Declaration of Helsinki.*

Conflict of Interest: *There is no conflict of interest with any institution or person. No financial support was received.*

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CASE REPORT

Can segmental branch embolization of the left gastric artery be an alternative in the treatment of recurrent dieulafoy lesion bleeding? A Case report

Tekrarlayan dieulafoy lezyon kanamalarının tedavisinde sol gastrik arter segmental dal embolizasyonu bir alternatif olabilir mi? Olgu sunumu

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Dieulafoy lesions, rare developmental vascular malformations within the gastrointestinal system, present a diagnostic challenge due to their inconspicuous nature. These lesions, primarily located near the esophagogastric junction, can lead to life-threatening bleeding. Although accounting for approximately 1.5-2% of upper gastrointestinal bleeding cases, the exact prevalence remains uncertain. Commonly diagnosed through esophagogastroduodenoscopy, the small size of these lesions often results in oversight during initial endoscopy, necessitating a high index of suspicion, especially in cases of recurrent bleeding. While endoscopic methods are the standard treatment, this case presentation introduces the use of embolization as a rare but effective modality in managing recurrent Dieulafoy lesion bleeding. The presented case underscores the importance of diverse treatment approaches and contributes valuable insights to the medical literature, enhancing the understanding and management of this infrequent yet potentially serious condition.

Key words: Dieulafoy lesion, gastrointestinal bleeding, embolization

Dieulafoy lezyonları, gastrointestinal sistemde nadir görülen gelişimsel vasküler malformasyonlardır ve göze çarpmamaları nedeniyle tanıda zorluklar yaşanmaktadır. Bu lezyonlar genellikle özofagogastrik bileşke yakınında bulunur ve yaşamı tehdit eden kanamalara neden olabilir. Üst gastrointestinal kanama vakalarının yaklaşık %1.5-2'sini oluşturduğu düşünülse de, prevalansı belirsizdir. Özofagogastroduodenoskopi ile teşhis edilen bu lezyonların boyutunun küçük olması, genellikle ilk endoskopide gözden kaçmasına neden olur ve özellikle tekrarlayan kanama durumlarında şüphe uyandırmalıdır. Endoskopik yöntemler standart tedavi iken, bu vaka sunumu tekrarlayan Dieulafoy lezyon kanamaları yönetiminde embolizasyonun etkin bir tedavi metodu olarak kullanımını tanıtmaktadır. Sunulan vaka, çeşitli tedavi yaklaşımlarının önemini vurgular ve seyrek ancak potansiyel olarak ciddi olan Dieulafoy lezyonlarının anlaşılmasına ve yönetimine katkıda bulunur.

Anahtar kelimeler: Dieulafoy lezyonu, gastrointestinal kanama, embolizasyon

INTRODUCTION

Dieulafoy lesion is a developmental vascular malformation of the gastrointestinal system. While it is rare, it can potentially lead to life-threatening bleeding. These lesions are typically found within 6 cm of the esophagogastric junction, originating from branches of the left gastric artery, primarily in the proximal fundal region of the stomach (1). They are less commonly encountered in the esophagus and colon. Although it is believed to account for approximately 1.5-2% of upper gastrointestinal bleeding cases, the exact prevalence in the general population remains uncertain (2). Dieulafoy lesions can cause severe gastrointestinal bleeding as a result of submucosal vascular dilation and vas-

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cular rupture. Diagnosis is typically made through esophagogastroduodenoscopy. Due to their small size and inconspicuous nature, these lesions often go undetected during the initial endoscopy. The suspicion of a doctor, especially in cases of recurrent bleeding, increases the likelihood of a diagnosis. Risk factors for bleeding may include the development of gastric atrophy with advancing age, chronic kidney disease, hypertension, liver disease, and the use of non-steroidal anti-inflammatory drugs (3). Treatment often involves endoscopic methods, with rare cases requiring laparotomy. In this case presentation, we shared our experience with embolization treatment in a patient with recurrent Dieulafoy lesion bleeding, a treatment modality that is rarely described in the literature.

CASE REPORT

A 47-year-old female patient presented to our hospital due to recurrent massive upper gastrointestinal bleeding of unknown cause. At the time of admission, her hemoglobin levels were around 9 g/dl, and she had received erythrocyte suspension replacements. Two previous endoscopic examinations had been conducted, with the first showing fresh blood in the stomach but no specific focus identified. Two days later, a follow-up endoscopy was reported as normal. Despite ongoing bleeding, a gastroscopic examination at our center did not reveal active bleeding in the stomach. However, a small, centrally red lesion was observed near the gastroesophageal junction in the fundal area. Given the clinical presentation, a diagnosis of Dieulafoy lesion was made, and sclerosing agent injection was administered to the lesion area during the same session, followed by the placement of a hemoclip (Figure 1). The patient was followed for an extended period without any complaints, and no signs of bleeding were observed during this time. After more than three years, the patient returned to our center with complaints of weakness, nausea, dizziness, and subsequently bloody vomiting. Her hemoglobin level at admission was measured at 6 g/dl. A gastroscopic examination revealed a substantial amount of pooled and fresh blood within the stomach, with no specific bleeding focus identified. The next day, an endoscopy showed a Dieulafoy lesion-like appearance in the fundus-corpora junction, and two hemoclips were placed. Due to the recurrent and severe nature of the bleeding, alternative treatment options were considered, and the opinion of the interventional radiology department was sought. Subsequently, endovascular embolization was planned for the patient. During the procedure, access was gained through the right femoral artery, the celiac trunk was catheterized, and imaging was obtained. Once the left gastric artery was localized with the acquired image, a microcatheter and wire were used to access the artery. Subsequently, embolization was performed using 300-500 micron embosphere particles in the vascular branch supplying the endoscopic clip area. This

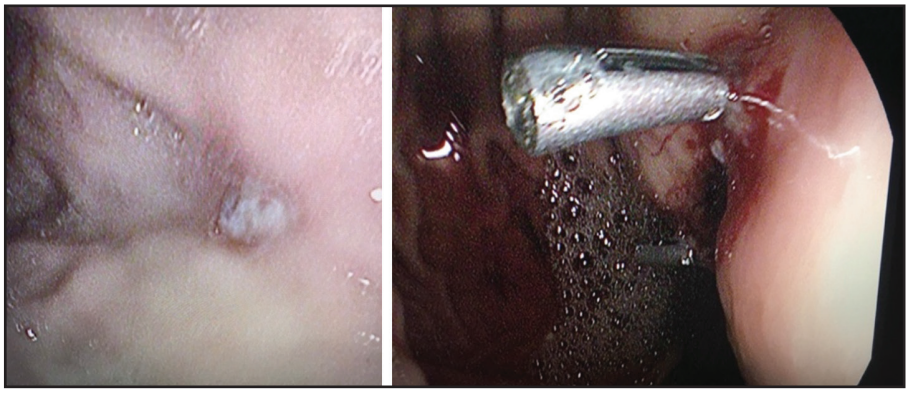

Figure 1 Lesion in the stomach fundus that is approximately 3 mm in size with redness in the center.

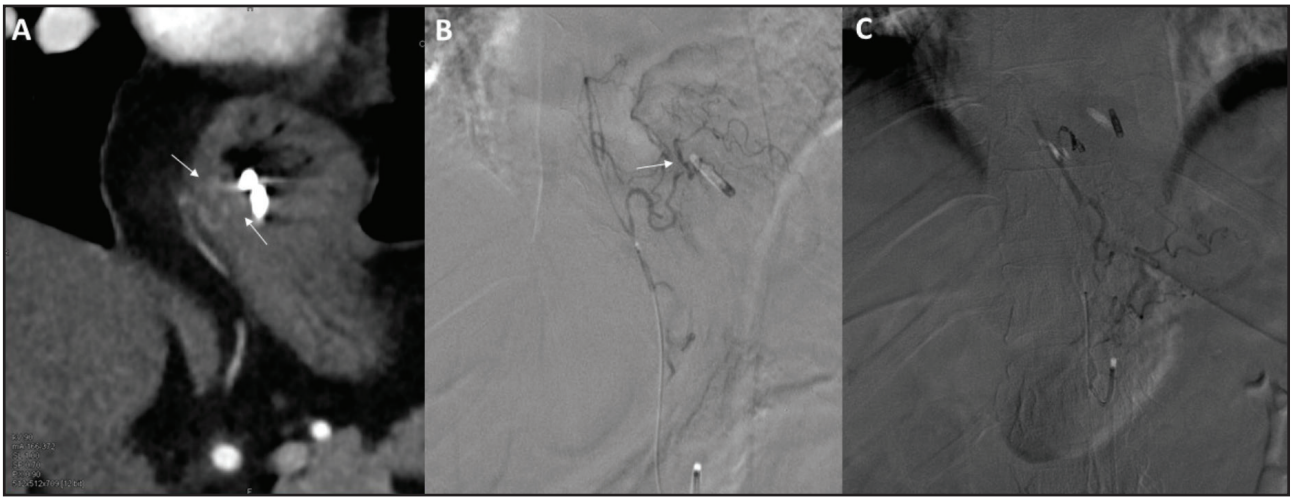

Figure 2 Computed tomography angiography **(A)** and Digital subtraction angiography **(B)** images obtained during the non-bleeding period show contour irregularity and slight enlargement (arrows) of the arterial branch that adjacent to the endoscopic clip (C) Digital subtraction angiography image shows occlusion of abnormal arterial branch after embolization with particles and coils.

branch was then embolized with a single coil, and the procedure was concluded at this point (Figure 2). No complications were encountered during or after the procedure. A follow-up endoscopy conducted four months ago revealed a millimetrically erythematous area at the location of the Dieulafoy lesion. No clinical issues have been observed in the patient during the follow-up period. Informed consent was obtained from the patient for this case presentation.

DISCUSSION

Dieulafoy lesions are sometimes challenging to diagnose, can be overlooked, and can potentially cause severe bleeding and death. The primary treatment option that should be applied is endoscopic therapy. Commonly used endoscopic treatments include injection, ablation, and mechanical therapies. Injection treatments involve the application of local epinephrine, sclerotherapy, and cyanoacrylate to the lesion and its surroundings (4,5). Ablation therapy includes thermocoagulation, argon plasma coagulation, and electrocoagulation. Argon plasma coagulation is a method that does not require contact with the lesion; it delivers an electric current to the tissue through ionized argon gas. Mechanical therapy involves band ligation and the use of endoscopic clips. Studies have shown the success of band ligation in the treatment of Dieulafoy lesions (6,7). Another meta-analysis has indicated that there is no significant difference between hemoclipping and band ligation, but more research is needed (7). In cases where patients do not respond to endoscopic hemostatic methods, embolization can be considered. While there is some mention of the use of this method in the literature, the information is limited. There is no definitive information available regarding the outcomes of this treatment method. Despite the risk of ischemia developing in the region supplied by the artery involved in all such interventions, embolization treatments have become an important tool in many areas today (8,9). In this patient, successful embolization with microsphere particles and coils was performed in the distal and segmental branches of the left gastric artery for recurrent Dieulafoy lesion bleeding. No bleeding was observed in the patient within a year, and a follow-up gastroscopy revealed only

mild erythema in the lesion area. We believe that this treatment can be successfully used by experienced physicians in suitable patients.

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CASE REPORT

Diffuse cavernous hemangioma of the rectosigmoid colon mimicking ulcerative colitis (with video)

Ülseratif koliti taklit eden rektosigmoid kolon diffüz kavernöz hemanjiyom

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Diffuse cavernous hemangioma of the rectosigmoid colon is a rare benign vascular lesion. The rectosigmoid colon is the most common site of this disease. It affects mainly young adults. The most frequent symptom is rectal bleeding, which can be confused with hemorrhoids, perianal diseases and ulcerative colitis. We present a case of diffuse cavernous hemangioma of the rectosigmoid colon mimicking ulcerative colitis.

Key words: Diffuse cavernous hemangioma, rectal bleeding, vascular lesions, colonic disease

Diffüz kavernöz hemanjiyom nadir görülen benign vasküler lezyondur. Rektosigmoid kolon bu hastalığın en sık görüldüğü bölgedir. Esas olarak genç yetişkinleri etkiler. En sık görülen semptomu hemoroid, perianal hastalıklar ve ülseratif kolit ile karıştırılabilen rektal kanamadır. Biz bu makalede ülseratif koliti taklit eden bir diffüz kavernöz hemanjiyom vakasından bahsedeceğiz.

Anahtar kelimeler: Diffüz kavernöz hemanjiyom, rektal kanama, vasküler lezyonlar, kolon hastalığı

INTRODUCTION

Diffuse cavernous hemangioma of the rectosigmoid colon (DCHRC) is a rare disease that usually affects young adults. Rectal bleeding is the main symptom. Bleeding can be acute, chronic or recurrent. As it is often misdiagnosed as hemorrhoids, it causes delayed diagnosis and unnecessary surgeries. DCHRC can sometimes be confused with adenomatous polyps, rectal varices, and ulcerative colitis (1). In this article, we present a case of DCHRC mimicking ulcerative colitis.

CASE REPORT

We present a 23-year-old man who has been experiencing recurrent episodes of rectal bleeding for two months. A rectosigmoidoscopy was done at another centre one month ago and he was diagnosed with ulcerative proctitis. The patient was treated with oral and rectal mesalazine, but he applied to our center for ongoing recurrent bleeding. He had no further symptoms like abdominal pain or fever. Nonetheless, he developed severe anemia due to frequent episodes of recurrent rectal bleeding and needed several blood transfusions before being referred to our hospital.

The patient's history revealed that angiography with embolization was performed due to spinal hemangioma, and there were multiple hemangiomas smaller than 1 cm in the liver. Rectal examination revealed a soft palpable mass from the anal verge. The laboratory test confirmed an iron deficiency anemia. Inflammatory parameters were normal. The patient's colonoscopy revealed diffuse, elevat-

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ed, and tortuous vascular lesions that extended from the sigmoid colon (35 cm from the anal verge) to the lower rectum **(Figure 1-with video)**. The patient underwent selective embolization of the superior rectal vessels. Endovascular embolization of arterial vessels of hemoangioma with microspheres was performed. The bleeding was stopped after the embolization treatment **(Figure 2-with video).** Segmentary resection of the affected segment was planned for the patient. Informed consent was given from the patient.

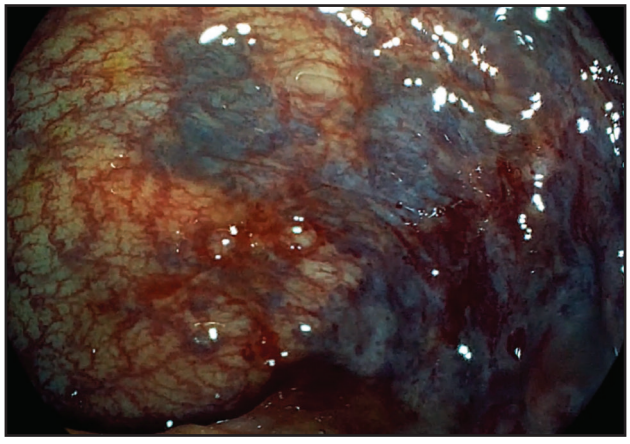

Figure 1 Colonoscopic image of diffuse cavernous hemangioma in rectosigmoid colon, i-scan imaging **(with video)**.

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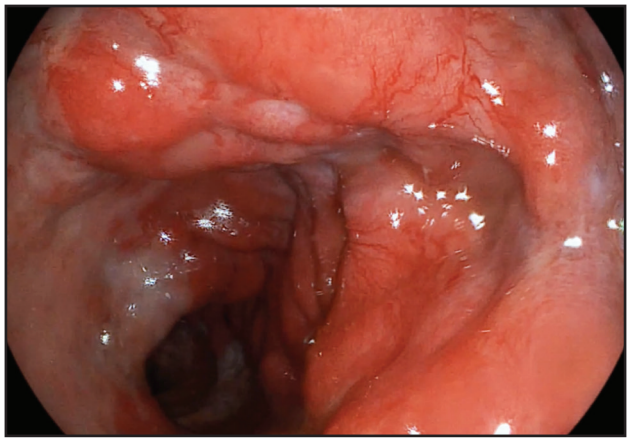

Figure 2 Diffuse cavernous hemangioma after the embolisation treatment **(with video)**.

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DISCUSSION

According to Pohlen, the incidence of gastrointestinal angiomas is 0.3% and is classified into five categories: Phlebectasias, cavernous hemangioma, diffuse infiltrating cavernous hemangioma, polypoidal cavernous hemangioma and capillary hemangioma (2). Diffuse cavernous hemangioma (DCH) is considered a progressive intestinal hamartoma. DCH of the colon, first described by Philips in 1839, is rare and mostly affects the rectosigmoid region (3). It causes acute, chronic and recurrent bleeding in patients. Since it is seen at an early age, its symptoms can often be attributed to internal hemorrhoids, polyps, or ulcerative colitis. This results in a long time between symptoms and diagnosis for these patients (4).

Diagnosis of the disease is made by demonstrating dilated and tortiosed venous structures in the rectosigmoid colon, sometimes severe mucosal hyperemia and erosions can be seen and can be confused with ulcerative colitis, as in our patient. In addition, phleboliths can be seen on x-ray and cross-sectional imaging (5). In acute bleeding, angiography with embolization can be beneficial, but extravasation is not always visible and recurrence is a rule. Controlling bleeding mostly requires a complete surgical resection. Non-surgical techniques such as sclerotherapy, cryotherapy or argon plasma coagulation were used. These procedures are only appropriate for lesions that are well-defined and small, otherwise the bleeding will recur (4,6).

Oner and Altaca recommended lower anterior resection for the treatment of rectosigmoid hemangioma in 1993 and remains the current standard of care for this disease, as it preserves the sphincter, which is important for maintaining quality of life (7). Preoperative embolization has been applied in recent years due to the presence of massive intraoperative bleeding in some patients (8). To prevent intraoperative bleeding, embolization was done in

our patient. After the procedure, there was not occurred any bleeding.

Our patient had spinal hemangioma along with colonic hemangioma. The association between spinal and gastrointestinal hemangiomas may suggest a systemic disorder of angiogenesis. Various familial disorders accompanied by multiple venous malformations have been described in the literature (9).

In conclusion, DCHRC should be considered and evaluated in addition to common diseases such as hemorrhoids, perianal diseases, and ulcerative colitis in patients presenting with acute, chronic or recurrent bleeding at a young age. In patients with hemodynamic instability due to severe bleeding, selective embolization can be performed preoperatively.

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EDİTÖRE MEKTUP

Dieulafoy lezyonunda endoskopik tedavilerin zorlu seçimi

The challenging choice of endoscopic treatment for Dieulafoy's lesion

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Sayın Editör,

Sarıtaş ve arkadaşları tarafından yazılmış ve 2023; 22, 3. sayıda yayınlanmış olan, "Dieulafoy lezyonu (DL) saptanan hastaların retrospektif analizi" başlıklı çalışmayı ilgiyle okudum. Bu çalışmada DL nedeni ile üst gastrointestinal sistem (GİS) kanaması geçirmiş olan hastalara uygulanan endoskopik tedavi yöntemleri ve tedavi sonlanımları değerlendirilmiş. Yazıdan anlaşıldığı üzere; DL en sık mide, korpus lokalizasyonunda saptanmış. Tüm hastalara terapötik endoskopik metodlar uygulanmış; en sık olarak ise skleroterapi ve hemoklip kombine tedavisi tercih edilmiş. Bir hastada terapötik endoskopik metodların başarısız olması nedeniyle cerrahi ihtiyacı gelişmiş, 3 hasta ise takipte kanama ilişkili nedenle exitus olmuş (1).

Üst GİS kanama kontrolünde, bilindiği üzere endoskopik tedavi modaliteleri temelde 3 grupta incelenir: 1. Epinefrin enjeksiyonu ile skleroterapi uygulaması, 2. Heater probe veya argon plasma ile termal terapötik uygulamalar, 3. Band ligasyonu ve hemoklip ile non-termal mekanik terapötik yöntemler. DL nedenli üst GİS kanamalarda ise, terapötik endoskopik metod olarak skleroterapi + hemoklip kombine tedavisi ön plana çıkmaktadır. Bu çalışmada da genel yaklaşım ile uyumlu olarak, terapötik endoskopik metodlardan kombine tedavi modaliteleri daha sıklıkla tercih edilmiş olup, sırasıyla skleroterapi + hemoklip, skleroterapi + heater probe ve skleroterapi + hemoklip + heater probe kombine tedavileri uygulanmış. Rekürren kanama riski nedeniyle skleroterapinin monoterapide önerilmemesi yaklaşımına bu çalışmada da uyularak, monoterapide yalnızca hemoklip uygulaması tercih edilmiş (1).

Yapılan çalışmalar, DL'ye bağlı üst GİS kanamalarda, hemoklip uygulamalarının akut kanama kontrolünde ve rekürren kanamayı önlemede skleroterapiye üstün olduğunu göstermiştir (2,3). Ancak, hemoklip uygulamasını monoterapide termal koagülasyon yöntemleriyle veya kombine tedavilerle karşılaştıran çalışma yoktur. Literatürde bu duruma dair az veri olması nedeniyle; bu çalışmada kanama nedenli exitus olan 3 hastada hangi endoskopik terapötik yöntemin uygulandığının, hastalarda rekürren kanama olup olmadığının ve oldu ise hangi yöntem sonrası olduğunun belirtilmesinin aydınlatıcı olması ve metodlar arasında kıyas yapabilmek için fikir verici olması adına önemli bir katkıda bulunacağı görüşündeyim.

Uluslararası Konsensus Önerileri (2010) doğrultusunda, non-varisiyel üst GİS kanamalarda rutin olarak ikinci bakış endoskopisi yapılmamaktadır (4). Bununla birlikte, kılavuzlar rekürren kanama için yüksek riskli hastalarda ikinci bakış endoskopisi önermektedir; önerilen durumlar: 1. Kan veya debris materyal nedeniyle ilk endoskopide vizüalizasyonun optimal olarak yapılamaması, 2. Terapötik endoskopik tedavinin ilk endoskopide

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optimal olarak gerçekleştirilememiş olması. Yapılan bir meta-analizde ise termal koagülasyon sonrası ikinci bakış endoskopisi ile rekürren kanama riskinde azalma olduğu ancak cerrahi ihtiyacı ve mortalitede azalma olmadığı gösterilmiştir (5,6). Tüm bu bilgiler ışığında ikinci bakış endoskopisi kriterlerinin daha da netlik kazanmasına hala ihtiyaç vardır. Bu nedenledir ki, bu çalışmada ve benzer çalışmalarda, hastalara ikinci bakış endoskopisinin yapılıp yapılmadığının ve yapılmışsa hangi nedenlerle yapıldığının belirtilmesi oldukça önemlidir. Bu hususun aydınlatılması, hasta takiplerinde morbidite ve mortaliteyi belirlemede katkı sağlayacaktır.

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LETTER TO THE EDITOR

A rare cause of lower gastrointestinal bleeding: Rectal dieulafoy's lesion

Alt gastrointestinal kanamanın nadir bir nedeni: Rektal dieulafoy lezyonu

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To the editor;

A Dieulafoy's lesion (DL) is defined as a dilated submucosal vessel that erodes the overlying epithelium without evidence of a primary ulcer or erosion (1). This lesion is usually seen in upper gastrointestinal system (GIS) and mostly in the stomach. DL in rectum is rare (1,2). It may cause life threatening bleeding (1). Nowadays, its' incidence is higher than before due to more use of endoscopy and with the development of endoscopic therapy modalities it's mortality and surgical interventions are lower (3). Here we report a very rare case of DL in rectum presenting with hematochezia and successfully treated with sclerotherapy and endoclips.

Eigthy years-old female patient admitted to emergency department of our hospital for decreased oral intake and poor general status. She had hypertension, diabetes mellitus, atrial fibrillation, and ischemic cerebrovascular disease before. She was hospitalized to intensive care unit for acute kidney failure and hypernatremia. At the third day of intensive care unit, she had rectal bleeding. On physical examination Blood pressure: 90/60 mmHg, pulse: 110 /min. Her general status was poor, she was pale. There was fresh blood on rectal examination. Laboratory data on admission was as follows: glucose: 304 mg/dL, urea: 154 mg/dL, creatinin: 2.77 mg/dL, albumin: 30 g/L, sodium: 152 mmol/L, white blood cell (WBC): 10.1 10^3/µl, hemoglobin: 9.8, international normalized ratio (INR): 1.19, other laboratory values were normal. Rectoscopy revealed spurting Dieulafoy's lesion in rectum. Her bleeding was controlled by two endoclips (Figure 1). She had one unit of erythrocyte transfusion during hospitalization. No rebleeding occurred during follow up. Her representative gave written consent regarding this article.

The etiology of DL is unknown. But patients have concomitant ischemic heart disease, hypertension, diabetes and chronic renal failure. Our patient had ischemic heart disease, hypertension, diabetes (2,4).

Early diagnosis and proper endoscopic treatment are very important in patients with Dieulafoy's lesion. Bleedings originated from DL increases hospital bills. Increased costs are related to increase in diagnosis of DL, lower visibility than other bleeding lesions on admission and more rebleeding rates (3), thus leading to more complication and more duration of hospital stay (3).

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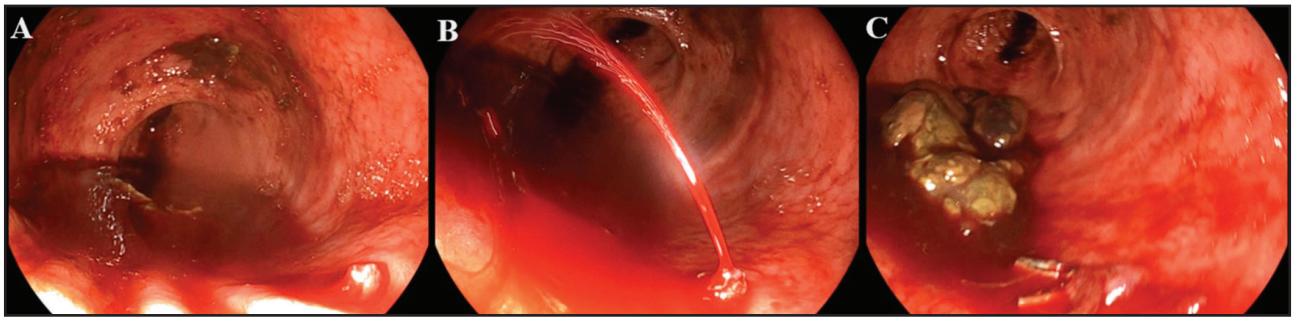

Figure 1 Dieulafoy's lesion oozing **(A),** spurting **(B)** and after hemoclip application **(C).**

Different endoscopic treatment modalities exist, endoscopic band ligation (EBL), and endoscopic hemoclip (EHC) are the most used treatment modalities (1,3,5). These modalities cause minimal tissue injury. There is no significant difference between EBL or EHC by means of primary hemostasis or prevention of rebleeding (6). EHC is the most used modality in the treatment of rectal DL (5). Endoclip is frequently used treatment method because of its ease of use, low cost, safety and effectivity and availability in many endoscopy units (7). In our case we diagnosed DL in first endoscopic examination, and we applied two EHC. No rebleeding occurred during follow up.

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