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ORIGINAL ARTICLE

# Retrospective analysis of patients with Dieulafoy's lesions

## Dieulafoy lezyonu saptanan hastaların retrospektif analizi

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**Background and Aims:** Gastrointestinal bleeding is an emergent condition in clinical practice. Early diagnosis and proper treatment of the lesion is essential. Dieulafoy's lesion is an aberrant submucosal vessel eroding surrounding mucosa. These lesions cause of 1-2% of all gastrointestinal bleedings. Here we report cases with Dieulafoy's lesion presenting with upper gastrointestinal bleeding. **Materials and Methods:** Through a time frame of between August 2017-August 2021, patients admitted to our hospital presenting with upper gastrointestinal bleeding and diagnosed as Dieulafoy's lesion were included in the study. Patients' files were screened retrospectively. **Results:** The study included 30 patients with a mean age of 65.9 ± 18.2 (20 - 92) years. Half of them were female. The most observed presentations were melena, hematemesis, and hematochezia. Associated diseases were hypertension, atherosclerotic heart disease and diabetes mellitus. In 26 (86.7%) patients, Dieulafoy's lesion was diagnosed in first endoscopy, while in four patients Dieulafoy's lesion was diagnosed in second endoscopy. Time interval between hospital admission to first endoscopy was 3.1 ± 2.5 (1 - 10) hours. In 23 patients Dieulafoy's lesion was in the stomach and in 6 patients in duodenum and in 1 patient in esophagus. Endoscopic therapy was applied to all patients. The most applied treatment modality was sclerotherapy + hemoclip application. One patient had required surgery due to recurrent bleeding. Six patients died. Three of them was bleeding related. **Conclusion:** Dieulafoy's lesion is a rare but serious cause of gastrointestinal bleedings. Early diagnosis and proper treatment is important. Patients may need repeated endoscopy for diagnosis. Hemoclip application is cheap, easy, safe, and effective treatment modality with/without sclerotherapy.

**Key words:** Dieulafoy's lesion, upper gastrointestinal bleeding, hemoclip, treatment



**Giriş ve Amaç:** Gastrointestinal kanamalar klinik pratikte sıklıkla karşılaşılan acil durumlardandır. Erken tanı ve uygun tedavi esastır. Dieulafoy lezyonu etrafındaki mukozayı erode eden aberran submukozal damardır. Bu lezyonlar gastrointestinal kanamaların %1-2'sine neden olur. Burada üst gastrointestinal kanama ile başvuran ve Dieulafoy lezyonu saptanan vakalarımızı sunacağız. **Gereç ve Yöntem:** Ağustos 2017-Ağustos 2021 tarihleri arasında üst gastrointestinal kanama nedeniyle hastanemize başvuran ve Dieulafoy lezyonu saptanan hastalar çalışmaya alındı. Hastaların dosyaları tarandı. Uygulanan tedaviler ve tedavi sonlanımları kaydedildi. **Bulgular:** Çalışmaya 30 hasta alındı. Ortalama yaş 65.9 ± 18.2 (20 - 92) idi. Hastaların yarısı kadındı. En sık başvuru sebepleri melana, hematemez ve hematokezya idi. Birlikte görülen hastalıklar hipertansiyon, aterosklerotik kalp hastalığı ve diabetes mellitus idi. Yirmi altı (%86.7) hastada Dieulafoy lezyonu ilk endoskopi ile tanı konulabilirken, 4 hastada ise ikinci endoskopide tanı konulabildi. Hastaneye başvuru ile ilk endoskopi arasındaki süre 3.1 ± 2.5 (1 - 10) saat idi. Yirmi üç hastada Dieulafoy lezyonu mide içerisinde, 6 hastada duodenumda ve 1 hastada da özofagusta görüldü. Tüm hastalara endoskopik tedavi yapıldı. En sık uygulanan endoskopik tedavi modalitesi skleroterapi ve hemoklip uygulaması idi. Bir hastada tekrarlayan kanama olması nedeniyle cerrahi gerekti. Altı hasta eksitus oldu. Bu hastaların üçünde eksitus nedeni kanama ile ilişkili idi. **Sonuç:** Dieulafoy lezyonu nadir fakat gastrointestinal kanamaların önemli bir sebebidir. Erken tanı ve uygun tedavi önemlidir. Tanı için tekrarlayan endoskopi gerekli olabilir. Hemoklip uygulaması skleroterapi ile veya skleroterapi olmaksızın ucuz, kolay, güvenli ve etkili bir tedavi yöntemidir.

**Anahtar kelimeler:** Dieulafoy lezyonu, üst gastrointestinal kanama, tedavi, hemoklip

## INTRODUCTION

Dieulafoy lesion (DL) is rare but life-threatening lesion with unknown etiology. It is an aberrant and dilated submucosal vessel, causing erosions on overlying mucosa, eventually leading to bleeding without ulceration. As the availability of endoscopy is increasing, its prevalence increases (1,2). DL

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is responsible 1-2% of all gastrointestinal bleeding and 5.6% of upper gastrointestinal bleedings (3). These lesions are usually observed in the stomach. They are rarely observed in colon, and they also very rarely cause bleeding in lower gastrointestinal system (2,4). These lesions are usually diagnosed by endoscopy as an aberrant vessel (4,5). Therefore, one third of cases cannot be diagnosed in first endoscopic examination, patients may need repeated endoscopic procedures (6).

Endoscopic treatment options are safe and effective. Endoscopic treatment modalities are recommended to treat bleeding from DL as first line therapy. In patients who cannot be treated endoscopically, embolization treatment with angiography or surgery are the other treatment options (5,7,8). Mortality is higher in patients with actively bleeding who were not diagnosed earlier and were not properly treated. Thus, in all patients presenting with gastrointestinal bleeding, DL must be kept in mind in differential diagnosis (1,7,9).With increasing use of endoscopy both in diagnosis and treatment and advances in endoscopic treatment modalities such as hemoclips, bands, heater probes etc. led to decrease in mortality from 80% to 8.6% (1,7). In this study we aimed to evaluate cases with DL presenting with gastrointestinal bleeding.

## MATERIALS and METHODS

Patients admitted to our hospital's gastroenterology endoscopy unit presenting with upper gastrointestinal bleeding with a diagnosis of Dieulafoy's lesion through a time frame of August 2017 and August 2021 were included in the study.

Diagnosis of Dieulafoy's lesion was made according to following criteria: 1. Active arterial bleeding or spurting from a defect smaller than 3 mm or through normal mucosa, 2. Protruding vessel with or without bleeding, within a minute mucosal defect or through normal appearing mucosa 3. The appearance of fresh, densely adherent clot with a narrow point of attachment to a minute mucosal defect or to normal appearing mucosa (1).

Patients' files were scanned according to study protocol. Age, sex, presentation type, accompanying diseases, previous drug history, time interval between admission and endoscopy times, localization of the lesion, applied treatment modalities complications related to endoscopic treatment, hospitalization duration including intensive care unit, laboratory values, transfusion number as well as mortality were all recorded.

The study was conducted according to the recommendations set by the Declaration of Helsinki on biomedical research on human subjects. The study was approved by Adana City Training and Research hospital Ethics Committee dated 16.09.2021 with decision number 1550.

## RESULTS

The study included 30 patients. Mean age was 65.9 ± 18.2 (20-92) and 50% were male and 50% were

**Table 1** Patients' characteristics, presentations, number of endoscopies to diagnose the lesion and time interval of hospital admission to endoscopy

| Parameter | |
|---|---|
| Age (year) | 65.9 ± 18.2 (20 - 92) |
| Presentation (%) | |
| Hematemesis | 12 (40%) |
| Melena | 18 (60%) |
| Hematochezia | 5 (17%) |
| Syncope | 3 (10%) |
| Accompanying diseases (%) | |
| Diabetes Mellitus | 7 (23.3%) |
| Hypertension | 14 (47%) |
| Atherosclerotic heart disease | 13 (43%) |
| Renal disease | 5 (17%) |
| Number of endoscopies | |
| 1 | 26 (86.7%) |
| 2 | 4 (13.3%) |

female. %60 of patients presented with melena, %40 of patients presented with hematemesis and %17 patients presented with hematochezia. The most accompanying diseases were hypertension, atherosclerotic heart diseases, diabetes mellitus and renal diseases. Twenty six patients (86.7%) were diagnosed in the first endoscopy and 4 patients (13.3%) were diagnosed in second endoscopy. The most common presentation was melena and hematochezia (Table 1). Ten patients were using acetylsalicylic acid, clopidogrel and nonsteroid anti-inflammatory drugs. Time interval between hospital admission to endoscopy was 3.1 ± 2.5 (1 - 10) hours. Mean Rockall Score was 6.4 ± 2 (3 - 11), mean Glasgow Blatchford Score 11.2 ± 3.9 (1 - 18) and mean AIMS65 scores were 1.9 ± 2.7 (0 - 14). Time interval of hospital admission to endoscopy and prognostic scores are given on Table 2.

**Table 2** Endoscopy time interval and gastrointestinal bleeding scores

| | |
|---|---|
| Time interval (hours) | 3.1 ± 2.5 (1 - 10) |
| Rockall score | 6.4 ± 2 (3 - 11) |
| Glasgow Blatchford Score | 11.2 ± 3.9 (1 - 18) |
| AIMS65 | 1.9 ± 2.7 (0 - 14) |

**Table 3** Laboratory data of patients

| **Parameters** | |
|---|---|
| WBC | 12 800 ± 7 048 (2 200 - 34 000) |
| Hb | 8.6 ± 2.4 (3.6 - 13.7) |
| Plt | 240 800 ± 116 300 (36 300 - 590 000) |
| INR | 1.3 ± 0.3 (0.9 - 2.1) |
| CRP | 31.1 ± 41.7 (0.1 - 143.1) |
| Glucose | 160.5 ± 67 (82 - 366) |
| AST (U/L) | 20.6 ± 10.9 (5 - 46.9) |
| ALT (U/L) | 14.4 ± 10.6 (3.9 - 57) |
| ALP (U/L) | 66.2 ± 187 (35 - 92) |
| GGT (U/L) | 19.1 ± 9.9 (9 - 39) |
| LDH | 245.5 ± 9.2 (137 - 449) |
| Bil | 0.6 ± 0.5 (0.2 – 2.7) |
| Alb | 30.5 ± 5.6 (23.6 - 40) |
| BUN | 103.9 ± 65.7 (16 - 283) |
| Cr | 1.8 ± 2.4 (0.4 - 10.9) |
| Na | 138.2 ± 4.8 (127 - 152) |
| K | 4.5 ± 0.7 (3.3 - 6.1) |

WBC: White blood cell; Hb: Hemoglobin; Plt: Platelets; INR: International normalized ratio; CRP: C-reactive protein; AST: Aspartate aminotransferase; ALT: Alanine aminotransferase; ALP: Alkaline phosphatase; GGT: Gamma glutamyl transferase; Bil: Total bilirubin; Alb: Albumin; BUN: Blood urea nitrogen; Cr: Creatinine; Na: Sodium; K: Potassium.

Mean hemoglobin levels were 8.6 ± 2.4 (3.6 - 13.7) and creatinine levels were 1.8 ± 2.4 (0.4 - 10.9) mg/dl. Laboratory data of patients are given in Table 3.

DL was found in stomach in 23 patients (76.7%), 6 patients in bulbus duodeni (20%) and one patient (3.3%) in esophagus. Endoscopic treatment applied to all patients. The most applied treatment modalities were sclerotherapy with hemoclip application in 17 (56.7%) patients, and hemoclip application in 8 (26.7) patients (Table 4). In one patient (3.3%),

**Table 4** Localization of lesions, applied treatments and prognosis

| **Location (%)** | **n (%)** |
|---|---|
| Esophagus | 1 (3.3%) |
| Stomach | 23 (76.7%) |
| Cardia | 7 (23.3%) |
| Fundus | 3 (10%) |
| Corpus | 10 (33.3%) |
| Antrum | 3 (10%) |
| Bulbus | 6 (20%) |
| **Treatment methods (%)** | |
| Sclerotherapy + Hemoclip | 17 (56.7%) |
| Hemoclip | 8 (26.7%) |
| Sclerotherapy + Heater probe | 3 (10%) |
| Sclerotherapy + Hemoclip + Heater probe | 2 (6.7%) |
| **Prognosis (%)** | |
| Exitus | 6 (20%) |
| Bleeding related | 3 (10%) |
| Nonbleeding related | 3 (10%) |

surgical intervention was required due to failure of endoscopic treatment which was applied twice. No complication occurred related to endoscopic intervention. Six patients died during follow up; 3 of them were bleeding related and 3 of them were not related to bleeding. Distribution of lesions applied treatment and prognosis are shown on Table 4.

## DISCUSSION

Gastrointestinal bleedings are very important and urgent topics of gastroenterology. It is very important to diagnose the lesion as fast as possible and applying proper treatment to the lesion is essential. Dieulafoy's lesion is a dilated, aberrant, submucosal vessel that is eroding the overlying epithelium without obvious ulceration and ultimately leading to bleeding. This lesion causes 1-2% of all gastrointestinal bleedings. It has been one of the most under-diagnosed conditions due to the subtlety of the lesion (1,2). As availability of endoscopy increases and advancement on endoscopic treatment modalities, the frequency of these lesions increases and mortality decreases (1,7,10).

There are difficulties to diagnose these lesions endoscopically. Since the lesion is small, blood and clots may hide lesions. Besides, intermittent bleeding makes it easily unrecognized. Additionally in colonic Dieulafoy's lesion, it can easily be overlooked without proper cleansing of bowel. Without proper diagnosis and treatment as fast as possible, massive bleeding may lead to mortality getting higher (5,11). With proper diagnosis and treatment, mortality is getting lower (1).

The etiology of DL is unknown. But most patients have concomitant ischemic heart disease, hypertension, diabetes mellitus and chronic renal failure. Using nonsteroid anti-inflammatory, anticoagulant and antiaggregant drugs increase the risk of gastrointestinal bleeding (6,12). Five of our patients were using acetyl salicylic acid, 2 of our patients were using clopidogrel and 1 patient was taking clopidogrel plus apixaban. In our study the most accompanying disease was hypertension followed by atherosclerotic heart diseases and diabetes mellitus, respectively. Associated diseases (such as cardiac diseases, hypertension, renal failure), and some drugs' (such as antiplatelet drugs) potential on forming DL or triggering bleeding has been reported in some studies (13,14).

Hospital cost due to bleedings from DL has increased in recent years. Increase in cost due to both increased diagnosis of DL and high risk of re-bleeding rates of these lesions. Since it can be overlooked, multiple endoscopic procedures due to re-bleeding may result in increased complication rate and prolong hospital stay, thus leading to increase in hospital cost (7). Additionally, these patients may have comorbid conditions, hospitalization duration may also increase due to comorbid conditions.

Depending on the location of DL, DL is presented with melena, hematemesis, or hematochezia and rarely with syncope due to massive gastrointestinal bleeding. DL are usually diagnosed endoscopically. In patients who cannot be diagnosed endoscopically; DL can be diagnosed by angiography, computed tomographic angiography, endoscopic ultrasonography, scintigraphy and rarely by pathologic examination after surgery (1,2,5,15).

DL maybe left undiagnosed in first endoscopy since it is small, causing intermittent bleeding episodes and due to blood and debris in gastrointestinal tract. Besides colonic DL may be overlooked due to inappropriate bowel preparation (5,11).

DL is observed most in the stomach and duodenum. But DL is also reported to occur throughout the gastrointestinal tract (1). Patients are presented with symptoms depending on the localization of the lesion and the degree of bleeding. Patients may

be presented by melena, hematemesis, or hematochezia. Rarely they may be presented by syncope or anemia symptoms (1,5). In our study DL was observed in stomach and duodenum, respectively. The most common localizations of DL in stomach were corpus, cardia, fundus, and antrum, respectively. The most common presentation was melena, hematochezia, and hematemesis. Five of our patients were presented by syncope or other symptoms. DL are mostly observed in stomach. The second most common place is duodenum. They are very rarely observed in colon (4,6,16). Massinha et al. reported in a case series of gastrointestinal bleeding due to DL that included 73 patients; 42 (57.5%) patients had DL in stomach, 15 (20.5%) patients had DL in duodenum, 11 (15.1%) patients had DL in rectum and only 3 (4.1%) patients had DL in colon. Sclerotherapy and endoscopic clip application were applied to more than half of the patients. Endoscopic hemostasis achieved in 96% of patients and no complications regarding to endoscopy were observed (12).

Early diagnosis of DL and proper treatment is very important. Since mortality is higher in patients who were not diagnosed and treated properly in early period, DL must be in differential diagnosis in all patients with gastrointestinal bleeding at presentation (1,9).

Endoscopy is mostly used both in diagnosis and treatment of DL. Endoscopic treatment modalities are preferred choice of treatment (5,7,8). Success rate of endoscopic treatment changes between 75-100% (5). Although there are different treatment approaches to treat DL, the best option is not clearly defined (5). Endoscopic treatment modalities can be divided into three groups: 1. Regional injection therapy such as sclerotherapy with epinephrine injection, 2. Thermal therapy with heater probe or argon plasma and 3. Non thermal mechanical treatments such as band ligation and hemoclip application. Hemoclip application and band ligation are thought to be the treatment of choice causing minimal surrounding tissue injury. Hemoclip application is one of the most used therapy methods (5,8,17). However, treatment of bleeding due to DL can be another combination of treatment options such as such as epinephrine injection and hemoclip (2,5,17). Since the availability of endoscopy and endoscopic therapy methods increase, embolization or surgical treatment are rarely needed (5,11,18).

In this study, the most applied treatment modality was hemoclipping with/without sclerotherapy. In our study, 17 patients were treated with sclerotherapy + hemoclip, 8 patients were treated with only hemoclip, 3 patients were treated with sclerotherapy + heater probe, and 2 patients were treated with sclerotherapy + hemoclip + heater prob applications. Endoscopic hemostasis achieved in all but one patient. The patient required surgical treatment. No complications related to endoscopy were observed.

We have found time interval between hospital admission and endoscopy as 3.1 ± 2.5 (1 - 10) hours. Shorter duration may help to diagnose DL easily and may also help to treat in time. As the duration increases, blood and debris may hide DL preventing the diagnosis. As far as we know there is no or limited study reporting the time interval between hospital admission and endoscopy.

In our study we have found mortality related to bleeding as low as 10%. Mortality may be low due to early diagnosis and faster intervention. As far as we know there is no study evaluating endoscopy timing and mortality. In our study, mortality not related to bleeding was also 10%. So, care must be focused on not only bleeding but also on comorbid conditions.

In conclusion, DL is a rare cause of gastrointestinal bleeding. Early diagnosis and proper treatment may improve prognosis. We think that in all patients presenting with gastrointestinal bleed-

ing, DL must be in differential diagnosis. Although multiple treatment modalities exist, hemoclip application with/without sclerotherapy is safe and effective therapeutic option, and it can be easily performed. Urgent endoscopy may increase the prevalence of DL. Proper treatment of hypertension and related diseases, especially in elderly patients, may decrease the prevalence of DL.

***Ethics Committee:*** *This study was approved by the ethics committee of Adana City Training and Research Hospital with the date of 16.09.2021 and number 1550. 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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