

ORIGINAL ARTICLE

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Evaluation of the frequency of hiatal hernia in patients undergoing upper gastrointestinal system endoscopy

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Abstract

Obesity was identified as an essential and independent risk factor for hiatal hernia. This study focused on the frequency of hiatal hernia detection in patients who underwent upper gastrointestinal system endoscopy in our clinic. The relationship between the frequency of hiatal hernia and demographic data and the patient's height-weight-body mass index was evaluated. This study examined the frequency of Hiatal hernia detection in 303 patients who underwent upper gastrointestinal endoscopy at our institution. The relationship between the frequency of hiatal hernia and demographic data and the patient's height-weight-body mass index was evaluated. Patient data were obtained from the hospital's electronic database. Age, gender, and upper gastrointestinal endoscopy reports were examined. The frequency of Hiatal hernia detection in patients who underwent upper gastrointestinal endoscopy was documented. According to the distribution of demographic and clinical findings of the patients, there was a statistically significant difference between the groups in terms of gender, age, waist circumference, and the occurrence of esophagitis ($p < 0.05$). The incidence of hiatal hernia was higher in men than in women, and the ages of patients with hernia were higher than those without. Waist circumferences and esophagitis rates of patients with hiatal hernias were higher than those without. As a result, obesity and body mass index (BMI) carry risks for hiatus hernia. In obese patients, Hiatal hernia should be included in the differential diagnosis of gastrointestinal complaints. The gold standard in the diagnosis of reflux is clinical and endoscopic examination.

Keywords: Hiatal hernia, sliding hernia, paraesophageal hernia, body mass index, obesity

Introduction

Hiatal hernia (HH) is characterized by the displacement (protrusion) of the stomach's proximal part or the esophagus's lower part towards the mediastinum. Its prevalence in society increases with age, and while it is seen in 10% of young adults, it is seen in 70% of people over 70. The disease is more common in women due to pregnancy [1].

Usually, at the opening (hiatus) where the esophagus passes through the diaphragm, the esophagus is surrounded by the right diaphragmatic crus muscles, fatty tissue, pharyngoesophageal ligament and membranes (Laimer's fascia), and this part is generally at the level of the squamocolumnar epithelial junction (Z line). During normal swallowing, contraction, and shortening of the esophagus, this muscle supports tissue moving upward (stretches) and brings it back to its normal position after the

swallowing reflex. The most crucial part that plays a role in protecting the esophageal mucosa against gastroduodenal reflux is the gastroesophageal junction (GOJ). The lower esophageal sphincter (LES) is an anatomical and physiological complex structure formed by the diaphragmatic crura, the location of the LES in the abdomen, the angle of His, and the phrenoesophageal ligament and membranes. In the presence of HH, structural, anatomical, and functional disorders constitute this region [2]. The disease is called by different names depending on the position of the GERD. Although two basic types have been described, sliding (Type I) and paraesophageal hernia (Type II), there is a mixed type (Type III), in which the stomach cardia and fundus pass into the mediastinum together, and Type IV, in which other abdominal organs enter the mediastinum through the hiatal opening. Type I hernias are 8-10 times more common than others [3].

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HH can be easily diagnosed with clinical findings, endoscopy, barium radiographs, and manometry studies. While radiology is an essential diagnostic tool today, endoscopy has recently started to come to the fore in diagnosis and treatment. Following 180° retroflexion while the endoscope is inside the stomach, the reflection (indentation) of the expanded diaphragmatic hiatus on the gastric mucosa can be seen. The endoscopic diagnostic criterion is to show that the AoE is at least 2 cm above the diaphragmatic indentation [4].

Congenital, traumatic, or iatrogenic causes may be responsible for the emergence of etiological factors. Conditions such as the development of short esophagus due to contraction of longitudinal muscles due to inflammation in the acidic esophagus due to chronic reflux may play a role in the development of HH. Obesity was identified as an essential and independent risk factor for HH [5].

This study focused on the frequency of hiatal hernia detection in patients who underwent upper gastrointestinal system endoscopy in our clinic. The relationship between the frequency of hiatal hernia and demographic data and the patient's height-weight-body mass index was evaluated.

Material and Methods

In this study, the frequency of Hiatal hernia detection in 303 patients who underwent upper gastrointestinal endoscopy at our institution between August and October 2023 was examined. Patients whose stomach segments were fully evaluated after appropriate fasting were included in the study. Patients whose entire stomach segments could not be evaluated and who underwent endoscopy due to emergencies such as gastrointestinal hemorrhage were not included in the study. Endoscopy was planned in patients with epigastric pain, weight loss, iron deficiency, heartburn, or reflux symptoms. Hill classification was used in the endoscopic classification of hiatal hernia. The relationship between the frequency of hiatal hernia and demographic data and the patient's height-weight-body mass index was evaluated. All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Ethics committee approval has been granted from Adıyaman University, Non-Invasive Clinical Research Ethics Committee with protocol number 2023/3-7, and informed consent has been obtained from all participants.

Patient data were obtained from the hospital's electronic database. Age, gender, and upper gastrointestinal endoscopy reports were examined. The frequency of Hiatal hernia detection in patients who underwent upper gastrointestinal endoscopy was documented.

Statistical analysis

Patient data collected within the scope of the study were analyzed with the IBM Statistical Package for the Social Sciences (SPSS) for Windows 26.0 (IBM Corp., Armonk, NY) package program.

Frequency and percentage for categorical data and mean and standard deviation for continuous data were given as descriptive values. For comparisons between groups, the “Independent Sample T–test” was used for two groups, and the “Pearson Chi-Square Test” was used to compare categorical variables. The results were considered statistically significant when the p-value was less than 0.05.

Results

Within the scope of the study, 303 patients aged between 18 and 91 were included in the evaluation. The average age of the patients was 47. The age distribution was 51.2% (n=155) were male and 48.8% (n=148) were female. While esophagitis was observed in 3% (n=9) of the patients, hiatal hernia was seen in 14.2% (n=43). The distribution of demographic and clinical findings of the patients is shown in Table 1.

Table 1. Distribution of demographic and clinical findings of patients

Variables (N=303)	n (%)	Mean±SD	Median (Min-max)
Gender			
Male	155 (51.2)		
Female	148 (48.8)		
Age (years)		47±17	46 (18-91)
18-40 years	114 (37.6)		
40-65 years	139 (45.9)		
>65 years	50 (16.5)		
Height (cm)		165.1±9.9	164 (143-191)
Weight (kg)		71.8±14.4	71 (38-119)
BMI (kg/m²)		26.4±5.2	25.7 (15.6-44.5)
<20	30 (9.9)		
20-25	100 (33)		
25-30	96 (31.7)		
>30	77 (25.4)		
Waist circumference		93.5±13.6	93 (60-126)
Esophagitis	9 (3)		
Esophagitis stage			
A	1 (11.1)		
B	6 (66.7)		
C	1 (11.1)		
D	1 (11.1)		
Hiatal hernia	43 (14.2)		
Grade of hernias			
1	28 (65.1)		
2	13 (30.2)		
3	2 (4.7)		

The distribution of demographic and clinical findings of the patients according to the presence of hiatal hernia is shown in Table 2. When the table was examined, it was seen that there was a statistically significant difference between the groups in terms of gender, age, waist circumference, and the occurrence of esophagitis (p<0.05).

Table 2. Distribution of demographic and clinical findings according to hernia occurrence in patients

	No hiatal hernia (n=260)			Hiatal hernia (n=43)			p-value
	n (%)	Mean±SD	Median (Min-max)	n (%)	Mean±SD	Median (Min-max)	
Gender							0.032
Male	126 (48.5)			29 (67.4)			
Female	134 (51.5)			14 (32.6)			
Age (years)		46±17	45 (18-91)		55±17	58 (21-84)	<0.001
18-40 years	106 (40.8)			8 (18.6)			
40-65 years	118 (45.4)			21 (48.8)			0.002
>65 years	36 (13.8)			14 (32.6)			
Height (cm)		165±10	164 (143-191)		165.8±9.2	165 (143-187)	0.531
Weight (kg)		71.3±14.4	71 (38-119)		74.9±14.5	75 (45-116)	0.098
BMI		26.3±5.2	25.5 (15.6-42.4)		27.3±5.2	26.3 (18-44.5)	0.210
<20	27 (10.4)			3 (7)			
20-25	91 (35)			9 (20.9)			
25-30	75 (28.8)			21 (48.8)			0.060
>30	67 (25.8)			10 (23.3)			
Waist circumference		92.6±13.6	92 (60-126)		99.1±11.9	98 (72-124)	0.003
Esophagitis	4 (1.5)			5 (11.6)			0.004
Esophagitis grade							
A	1 (25)			0 (0)			
B	3 (75)			3 (60)			
C	0 (0)			1 (20)			0.403
D	0 (0)			1 (20)			

The incidence of hiatal hernia was higher in men than in women, and the ages of patients with hernia were higher than those without. Waist circumferences and esophagitis rates of patients with hiatal hernias were higher than those without.

Discussion

The herniation of the stomach and sometimes other abdominal organs into the thorax due to a defect in the hiatus is called a hiatus hernia. If the herniation concerns only the esophagogastric junction, it is called sliding. If the fundus and other parts of the stomach herniate through the hiatus, it is called paraesophageal hiatus herniation [6]. Although congenital and acquired causes are blamed for the development of hiatus hernia, its etiology has not been fully explained. While reflux complaints due to disruption of the antireflux mechanism are prominent in the sliding type, findings such as respiratory distress, recurrent lung infections, dysphagia, and anemia are more pronounced in the paraesophageal types. Plain and opaque upper gastrointestinal system radiographs are most commonly used in diagnosis. The treatment is surgery, except for asymptomatic sliding hernias that do not cause signs of reflux disease [7].

Patients often appear asymptomatic, but after anamnesis, more than 90% of these patients describe complaints and findings that occur due to hernia and are overlooked. Signs and symptoms

range from mild indigestion to severe septicemia. Reflux, postprandial chest pain, regurgitation, the feeling of early satiety, epigastric pain, chronic digestive system bleeding, vomiting, difficulty swallowing, palpitations, shortness of breath with or without aspiration, perforation due to gastric volvulus, mediastinitis, and septic shock may be encountered [8]. Patients may develop acute symptoms due to obstruction or strangulation of the hernia. Strangulation may result in perforation of the intrathoracic portion of the stomach. This tragic complication can often be misdiagnosed as myocardial ischemia, causing delays in diagnosis and, therefore, treatment. Microcytic anemia may develop in some patients due to chronic blood loss due to gastric mucosa erosion during stomach movement through the narrowed esophageal hiatus. In type 1, hernias, reflux, and related clinical conditions are more prominent [9,10].

Anemia of chronic disease may be observed in cases, and the study of Pearson et al. [11] reported that gastric volvulus, which causes acute dysphagia, substernal or epigastric pain, and substernal discomfort, developed in 43 of 53 patients. Additionally, hernia contents were incarcerated in 23 of these 53 patients. Acute shortness of breath was observed due to the enlarged stomach and limited cardiopulmonary functions. In another complementary study, Walther et al. reported gastric volvulus, bleeding, and strangulation with a frequency of 30% [12].

Diagnosis of paraesophageal hernia becomes easier when symptoms such as early satiety, chest pain, and regurgitation appear. Observation of air or air-fluid level behind the heart above the diaphragm in direct chest radiography is the most essential reason for suspicion in the diagnosis. If a nasogastric tube is tried before radiography in emergencies, it may be observed that the tube is bent in the intrathoracic part of the stomach. However, in sliding-type hernia, no suspicious situation is usually celebrated on direct radiography [13]. Retrocardiac shadowing or masses and air-fluid levels are seen on thorax tomography. This situation requires contrast-enhanced upper gastrointestinal system imaging, a critical diagnosis method. Serial imaging of the upper gastrointestinal tract can help determine the anatomy of the stomach and esophagus, the relationship between these structures, the localization of the GERD, and its relationship with the diaphragmatic hiatus. These examinations can also provide information about esophageal motility, gastric emptying, esophageal strictures, masses, and the presence of esophageal and stomach ulcers and the presence of gastric volvulus. If the gastric herniation reaches a size of 5 cm or more, this may be a sign of a short esophagus [14]. Again, an upper digestive system endoscopic examination may help diagnose. The manometric examination was mainly used to diagnose short esophagus, and its positive predictive value was still found to be only 25% [15].

The disease is frequently seen in men between 50-70 in the literature. There is an increase in elderly individuals over 65 globally, more prominently in developed countries. Obesity gradually increases with age, especially being more evident between the ages of 50 and 60. With aging, significant changes in body structure are observed due to atrophy in muscle and lean tissues and a more substantial increase in fatty tissues, especially in the visceral regions [16]. Nutritional disorders occur due to physiological, psychological, economic, and social irregularities due to advancing age. There is increasing malnutrition, which results in overweight and obesity. Morbid obesity is a risk factor for GER. HH is quite common in this population. High body mass index (BMI) is associated with an increase in the incidence of hiatal hernia and a decrease in the chance of surgical success [17]. In our study waist circumferences and esophagitis rates of patients with hiatal hernias were higher than those without. Additionally, the incidence of hiatal hernia was higher in men than in women, and the ages of patients with hernia were higher than those without. Regarding the outcomes of this research, there was a statistically significant difference between the groups in terms of gender, age, waist circumference, and the occurrence of esophagitis.

Conclusion

As a result, increasing age and BMI carry risks for hiatus hernia. In obese patients, Hiatal hernia should be included in the differential diagnosis of gastrointestinal complaints. The gold standard in the diagnosis of reflux is clinical and endoscopic examination.

Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical Approval

Ethics committee approval has been granted from Adiyaman University, Non-Invasive Clinical Research Ethics Committee with protocol number 2023/3-7.

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