

# Evaluation of patients with gastric polyps

Sehmus Olmez,<sup>1</sup> Suleyman Sayar,<sup>2</sup> Bunyamin Saritas,<sup>3</sup> Ayla Yildiz Savas,<sup>4</sup> Ufuk Avcioglu,<sup>5</sup> Ilyas Tenlik,<sup>6</sup> Ersan Ozaslan,<sup>7</sup> Hasan Tankut Koseoglu,<sup>7</sup> Emin Altiparmak<sup>7</sup>

<sup>1</sup>Department of Gastroenterology, Adana Numune Training and Research Hospital, Adana, Turkey

<sup>2</sup>Department of Gastroenterology, Umraniye Training and Research Hospital, Istanbul, Turkey

<sup>3</sup>Department of Gastroenterology, Mersin University Faculty of Medicine, Mersin, Turkey

<sup>4</sup>Department of Gastroenterology, Balikesir University Faculty of Medicine, Balikesir, Turkey

<sup>5</sup>Department of Gastroenterology, Ozel Koru Hospital, Ankara, Turkey

<sup>6</sup>Department of Gastroenterology, Turkiye Yuksek Ihtisas Training and Research Hospital, Ankara, Turkey

<sup>7</sup>Department of Gastroenterology, Ankara Numune Training and Research Hospital, Ankara, Turkey

## ABSTRACT

**OBJECTIVE:** The incidence of gastric polyps (GPs) greatly differs according to study populations and was found to be 0.33%–6.7% in various studies. The majority of GPs are composed of hyperplastic polyps (HPs), fundic gland polyps (FGPs), and adenomatous polyps (APs). Although APs have a high risk of malignant potential, sporadic FGPs have no malignant potential. Conversely, HPs have a low risk of malignant potential. It is not sufficient to perform a biopsy to identify the polyp type and the presence of dysplasia; thus, some polyps may require multiple biopsies or total excision.

**METHODS:** This retrospective study included patients with GPs or polypoid lesions found on esophagogastrosocopy with polyp or malignant histology on biopsy at Ankara Numune Training and Research Hospital Endoscopy Unit between 2005 and 2011.

**RESULTS:** In a series of 56.300 upper endoscopies, 192 patients (0.34%) were found to have GPs. Among the patients, 51 (26.6%) were men and 151 (73.4%) were women. The average age of the patients was 61.9±13.3 (14–90) years. The frequency of HPs, APs, and FGPs were 88%, 2.6%, and 1.6%, respectively. The size of the polyps was ≤1 cm in 137 (70%) patients. One polyp was determined in 141 (73.4%) patients. The most common localizations of polyps were the antrum and corpus. Endoscopic snare polypectomy was performed in 64 patients. One bleeding episode was observed, which required endoscopic treatment after ESP.

**CONCLUSION:** In our study, the GP frequency was low (0.34%), whereas the frequency of HP maybe high due to the high frequency of *Helicobacter pylori* (HPy) infection in our country. The frequency of FGP is probably low due to the high frequency of HPy infection and the short-term use of proton-pump inhibitors.

*Keywords: Endoscopic polypectomy; hyperplastic polyp; gastric polyp.*

Polyps are usually asymptomatic and >90% of polyps were coincidentally detected on esophagogastroduodenoscopy performed for other reasons. Large polyps may cause bleeding, anemia, abdominal pain, or may lead to obstruction rarely due to its localization [1].

A definite diagnosis of polyps should be made by histological examination [2]. The frequency of gastric

polyps (GPs) and types of polyps greatly varies depending on the population in which the study is conducted. The frequency of polyps is 0.6%–6% [3, 4]. The great majority of polyps detected in the stomach are hyperplastic polyps (HPs), fundic gland polyps (FGPs), and adenomatous polyps (APs) [5]. HPs are the most common in populations in which *Helicobacter pylori* (HPy)



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Correspondence: Dr. Sehmus Olmez. Adana Numune Egitim ve Arastirma Hastanesi, Gastroenteroloji Bolumu, Adana, Turkey.  
Tel: +90 535 618 19 80 e-mail: drsehmusolmez@gmail.com

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infection is common [6]. In countries where HPy infection is low, FGP is more common [3]. In addition, the frequency of FGP increases with the use of long-term proton-pump inhibitors (PPIs) [7].

The importance of GPs arises from the fact that some GPs have malignant potential or are associated with some hereditary syndromes [1]. Although GPs are seen in some congenital diseases such as familial adenomatous polyposis, juvenile polyposis, and Peutz–Jeghers syndrome, the great majority are coincidentally detected [8]. There is an increased risk of cancer in polyps other than FGPs and inflammatory fibrinoid polyp (IFPs). While the risk of malignancy is low in HPs, malignant transformation is seen more frequently in APs. Due to their malignant potential and symptomatic nature, the treatment of GPs is complete removal of the polyps by endoscopic or surgical excision [1].

In this study, we aimed to evaluate the demographic, clinical, endoscopic, and histological data of patients with polyps or polyp-like lesion or malignancy in their histological examination. In addition, we aimed to evaluate the diagnostic procedures, treatment modalities which were applied to treated patients, complications of these treatments, and relationship between age and polyp's size and number.

## MATERIALS AND METHODS

At the Ankara Numune Training and Research Hospital Gastroenterology Clinic Endoscopy Unit, we retrospectively screened the findings in 56.300 consecutive esophagogastroduodenoscopy (EGD) procedures that were performed for various reasons between September 2005 and December 2011. Permission was obtained from the local ethics committee for the study.

Patients in whom GPs or polyp-like lesions were found on EGD and polyps or malignant histology on biopsy were included in the study. Patients without polyps on biopsy, previously taken for the study and inaccessible to their pathology records, were excluded from the study. Patients were screened in detail. We evaluated the age, sex, endoscopic indications, endoscopic findings, GP count, size and localization, diagnostic methods used for histology, and complications of endoscopic treatment if it was performed. The relationship between age and polyp size and count was also evaluated.

The endoscope used was a Fujinon EG 530 WR

video gastroscope (Fujinon, Omiya, Japan; diameter 9.4 mm, working channel 2.8 mm). The polyp size was estimated by comparing it with the opening size of the biopsy forceps. In patients with multiple polyps, the diameter of the polyp was calculated by measuring the diameter of the largest polyp.

## Statistical Analysis

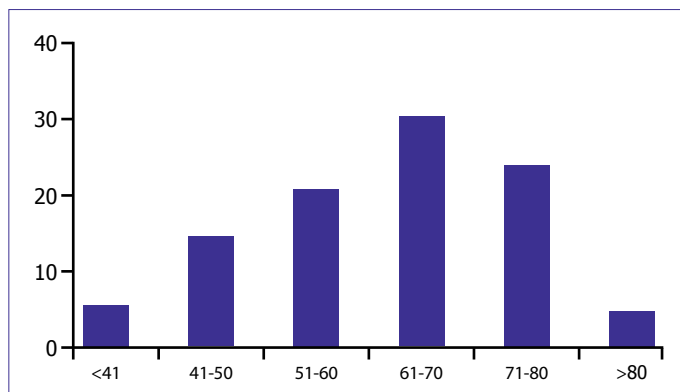
SPSS for Windows 18 package program (SPSS Inc, Chicago, Illinois) was used to analyze data. Descriptive statistics were used to describe continuous variables. The  $\chi^2$  (Fisher's exact) test was used for categorical variables and expressed as observation counts (and percentages). Statistical significance was accepted when a two-sided p-value was  $<0.05$ . The Kolmogorov–Smirnov test was used to analyze categorical data that fit normal distribution whereas Spearman correlation was used if the distribution of variables was not normal.

## RESULTS

A total of 56.300 patients who underwent EGD in our endoscopy unit was included. GPs were found in 192 patients. We found the incidence of GP as 0.34%.

**TABLE 1.** Demographics data and clinical characteristics of patients

	Patients n(%)
Sex	
Male	51 (26.6)
Female	141 (73.4)
Age (years)	
Male	65.9±11.6 (35-90)
Female	60.5±13.7 (14-88)
Total patients	61.9±13.3 (14-90)
Symptom	
Dyspepsia	60 (31.3)
Anemia	44 (22.9)
Abdominal pain	39 (20.3)
Other	49 (25.5)
Polyp size (Mean±SD) (mm)	11.0±8.4 (3-75)
Distribution of polyp size (mm)	
<6	51 (26.6)
6-10	86 (44.8)
11-20	43 (22.4)
>20	12 (6.3)



**FIGURE 1.** The age distribution of patients with gastric polyps.

Patient characteristics are shown in Table 1. The age distribution of patients was evaluated. Of the patients, 5.7% were under the age of 41 years, 14.6% were 41–50 years, 20.8% were 51–60 years, 30.2% were 61–70 years, 24% were 71–80 years, and 4.7% were >80 years. The age distribution of the patients is summarized in Figure 1. The average polyp diameter of the patients was 11.0±8.4 (range: 3–75) mm. The diameters of the polyps were ≤5 mm in 51 (26.6%) patients, 6–10 mm in 86 (44.8%) patients, 11–20 mm in 43 (22.4%) patients, and >20 mm in 12 (6.3%) patients. There was no statistically significant correlation between age and polyp size ( $p>0.05$ ). Endoscopically, one polyp was found in 73.4% of the study patients. More than one polyp was found in 26.6% of the patients. There was no relation between age and polyp count ( $p>0.05$ ).

Histopathologic diagnosis of polyps was made with only biopsy in 52 (27.1%) patients, with polypec-

tomy using biopsy forceps in 75 (39.1%) patients, with polypectomy with snare in 64 (33.3%) patients, and with enucleation via surgical procedure in one patient who could not be diagnosed with endoscopic biopsy. Histologically, the polyp diagnosed with enucleation was reported to be an IFP. Foveolar hyperplasia was found in nine cases (4.7%). The histological distribution of the patients is summarized in Table 2. Only two cases (1%) with GP were diagnosed with adenocarcinoma. The most common localizations of GPs were the antrum (35.9%), followed by the corpus (25.5%) and cardia (15.1%). Polypectomy was performed in 75 patients (39.1%) using biopsy forceps. No complications were seen in 74 patients who underwent polypectomy using biopsy forceps; only one patient experienced bleeding in the form of leakage during polypectomy, and hemorrhage was controlled with sclerotherapy.

Polypectomy with snare was performed in 64 patients (33.3%). Polypectomy with snare was performed alone or in combination with other sclerotherapy, endoclip, or endoloop treatments. The distribution of different methods of polypectomy with snare is given in Table 3. In patients who underwent polypectomy with snare, the diameter of the polyp was 16.0±10.5 (3–75) mm. Complications related to polypectomy with snare were not seen in 59 (92%) patients; bleeding was observed in four patients during polypectomy with snare. Bleeding spontaneously stopped in two patients during endoscopic polypectomy, and sclerotherapy was applied to two patients. In one patient, bleeding was observed at the base of the polyp, with hematemesis occurring 4 hours after the polypectomy with snare. Bleeding was controlled by sclerotherapy and blood transfusion was not required.

**TABLE 2.** The distribution of histopathologic types of gastric polyps

	n (total=192)	%
Hyperplastic polyp	169	88
Foveolar hyperplasia	9	4.7
Fundic gland polyp	3	1.6
Adenomatous polyp	5	2.6
Adenomatous and hyperplastic polyp	1	0.5
Inflammatory fibroid polyp	1	0.5
Fibrotic polyp	1	0.5
Adenocarcinoma	2	1
Carcinoid Tumor	1	0.5

**TABLE 3.** The distribution of snare polypectomy

	Patients no	%
Polypectomy with snare (PS)	37	57.8
PS + sclerotherapy	21	32.8
PS + endoloop	3	4.7
PS + sclerotherapy + endoloop	2	3.1
PS + sclerotherapy + endoclip	1	1.6
Total	64	100

PS: Polypectomy with snare

## DISCUSSION

In our study, we found that the most common symptoms in patients with GPs were dyspepsia, anemia, and abdominal pain. We also found that GPs were localized mostly in the antrum, and the most common histopathologic type was an HP.

Carmack et al. found the incidence of GP as 6.35% in 121,564 EGD operations. The most frequent polyp type was FGPs, which accounted for 77% of all polyps, whereas HPs and FHPs were 17% of all polyps. The 16% of lesions defined as polyps did not have histopathological polyp or malignant histology. They related high frequency of FGP with long-term PPI use and low frequency of HPy infection [3]. Elhanafi et al. reported that the most frequent polyp type was HP in 7,090 endoscopic procedures. They concluded that it might be caused by increased HPy infection [9]. However, Macenlle-Garcia et al. reported that GP was found in 18 patients (0.33%) and the most frequent type was HP in 5,314 EGD procedures [10]. In a study performed by Roseau et al., GP was found in 191 (1.3%) patients in 13,000 EGD procedures. Histology of the polyps was HP in 48 patients, FGP in 17 patients, and AP in 6 patients, whereas the histology of 118 patients (61.8%) was either gastritis or normal histology [11]. In 157,902 endoscopic procedures performed by Fann et al., the incidence of polyps was found to be 2.56% and the most frequent type was FGP [12].

In our study, the most frequent type of polyp was HP. HPy infection frequency in our country is 82% [13]. In countries where the HPy frequency is high as in our country, the most frequent polyps are HPs [14]. In a study performed by García-Alonso et al., polypoid lesions were found in 269 patients (4.2%) in 6,307 EGD procedures. The mean age of the patients was 65 years, and the proportion of the women was 61%. Histology of polyps were 50.9% HP, 7.4% FGP, and 3% AP. Also, the incidence of adenocarcinoma was 1.9%. Histopathologic diagnosis was normal mucosa in 29.7% of patients who had polyp in EGD [8]. Morais et al. reported GPs in 153 patients (0.59%) in 26,000 endoscopic procedures. Of these patients, 41.2% were females and the mean age of the patients was 64 years. The frequency of polyps was HP in 71.3%, FGP in 16.3%, and AP in 12.4%. Adenocarcinoma was found in one patient with HP and one patient with AP [4]. Molaei et al. reported the frequency of GP as 69.2% for HP, 6.6% for FGP, and 4.7% for AP. The mean age of the patients was 49 years and 73% were

males. The size of the polyps was <10 mm in 87% of the cases [14]. In a study performed by Fann et al., the mean age was 54.7 years, 63% of patients were females, and 37% of patients were males [12]. In our study, approximately 80% of the patients who were diagnosed with GPs were >50 years. There was no relation between age and polyp size and count. HPs and APs usually appear in older individuals [8]. The incidence of GPs was 0.59%–3.4% in previous studies in our country [6]. In our study, the incidence of GP was 0.34%, which was lower than that in most of the other studies. The reasons for this may be due to the exclusion of patients with benign pathology or inappropriate sampling of polyps. There are few studies on GP in our country. In a study performed by Gencosmanoglu et al., the GP incidence was 3.4%, and 46% of polyps were found to be HPs, 18% were found to be FHPs and 14% were found to be FGPs. The mean age of the patients was 51 years and the proportion of women was 58%. Polyp size was found to be <5 mm in 58% of the patients [6]. In a study performed by Karaman et al., GP was found in 69 (0.59%) patients in 11,598 EGD procedures. While 69% of all polyps were HPs, 10% were FGPs [15]. In the study performed by Buyukasik et al., HPs were found in 66.7% of 55,987 EGD procedures [16]. The incidence of GP was 2.22% and the highest frequency of HP was found as 36.2% in a study performed by Vatansever et al [17]. In our study, the most common polyps were HPs. However, the frequency of HP was higher than that in previous studies. In addition, the FGP frequency was significantly lower than that in other studies. However, GP was found in 66 (1.95%) patients in 3,375 EGD procedures in a study performed by Demiryilmaz et al. [18] A total of 88 gastric polypoid lesions was detected in these patients. Histopathological examination of polyps revealed 80.7% as HPs, 17% as inflammatory polyps, and 2.3% as APs. No FGP was detected in this study [18].

FGP was the most frequent polyp in some studies [3-7]. The frequency of these polyps has increased due to the decrease in the frequency of HPy infection and increased use of PPIs [3]. Graham first described the development of FGP in three patients treated with omeprazole in 1992 [19]. After this definition, increased FGP frequency with the use of PPI has been shown in many studies [20, 21]. The existence of such a relationship causes anxiety in both physicians and patients who need long-term PPI use. In a study performed by Jalving et al., there was no increase in the frequency of FGP in patients using PPI for <1 year. However, long-term PPI

use was found to increase the risk of developing FGP 4-fold. However, there was no increase in the risk of dysplasia. When subgroup analysis was performed, the risk of developing FGP was observed increased significantly in patients with PPI use for more than 5 years. The increased risk of developing FGP due to long-term PPI use was not different between patients using omeprazole and those using other PPIs [7]. However, increased FGP frequency with PPI use has not been observed in some studies [22]. A total of 30,347 H<sub>Py</sub>-negative patients were evaluated and FGP frequency was found to be similar to that in 28,096 patients who do not use PPI and 2251 patients who use PPI, and there was no increased risk of polyps in PPI users [22]. This may be due to short-term PPI use [7]. In a study performed by Choudhry et al., patients using PPI had the highest risk of developing FGPs after a mean of 37 months [23]. Hongo et al. investigated the development of FGPs and HPs in patients with prolonged PPI use in a prospective study. Long-term PPI use has been associated with increased FGP frequency in H<sub>Py</sub>-negative patients. The formation of these polyps was not associated with hypergastrinemia. However, HP development was associated with H<sub>Py</sub> positivity and hypergastrinemia [24]. In our study, FGPs were found in three patients. The association of FGPs with H<sub>Py</sub> is known. H<sub>Py</sub> infection reduces FGP formation. These polyps are common in H<sub>Py</sub>-negative patients [25]. This low incidence may be related to the high frequency of H<sub>Py</sub> infection in our country. However, even in countries with high H<sub>Py</sub> infection rate, the FGP frequency may be high [14]. These polyps have never been observed in some studies [9]. The frequency of FGP has been associated with long-term PPI use. No increased risk for short-term use was observed [7, 14, 18]. The most common cause of EGD procedures in our patients was dyspeptic complaints. FGP frequency, which is very low in our patients, is probably due to the short duration of our patients' use of PPI therapy. Moreover, since these polyps are quite small, they may be missed during EGD operations or because they may be ignored due to their partially indistinguishability because of their endoscopic appearance.

In our study, FHPs were found in nine patients (4.7%). These lesions are thought to be HP precursors. It is not known how often these lesions will turn into HP. The lesions may be stable or may grow or shrink [26]. However, whether they are HP precursors or not is still being debated. Stolte et al. showed that the basic structures and cytological criteria of FHPs and HPs can easily

be distinguished in biopsy materials taken by endoscopic forceps. These lesions are not the result of HP precursors [27]. FHPs are highly common lesions in studies [6, 14]. In our study, APs were detected in five patients. APs constitute  $\leq 10\%$  of GPs [5]. These polyps are more common in communities where stomach cancers are common and have high malignant potential [5]. Malignant potential of AP is 6.8%–55.3% [28]. The size of the lesion, high-grade dysplasia, and presence of intestinal epithelium are risk factors for malignancy development [5]. Even adenomas with low-grade dysplasia in the long-term follow-up have been shown to have a malignant potential. For this reason, excision of these lesions is recommended [29]. In addition, IFP was detected in one patient. These polyps are not always diagnosed with endoscopic biopsy because they are deeply localized [30]. Since our case could not be diagnosed with endoscopic biopsy, it was diagnosed with surgical enucleation.

A total of 64 patients (33.3%) underwent polypectomy with snare. One patient had hemorrhage requiring endoscopic control. This patient's bleeding was controlled by endoscopic treatment. The low frequency of bleeding due to ESP may be treated by sclerotherapy, endoclip, or endoloop procedures. Mortality and perforation did not occur in any patient. Polypectomy with snare is a safe and effective method for the correct diagnosis and treatment of polyps.

As a result, the GP frequency in our study was very low (0.34%). The most common type of gastric polyp was HP, but it must be kept in mind that GPs may have adenocarcinoma or precancerous histology, and removal of GP with appropriate technique (removal with biopsy forceps or polypectomy with snare) is recommended.

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**Authorship contributions:** Concept – S.O.; Design – S.O., H.T.K., S.S.; Supervision – E.A.; Materials – S.O., S.S., U.A., I.T., A.Y.S.; Data collection &/or processing – A.Y.S., U.A., I.T.; Analysis and/or interpretation – S.O., B.S., E.O.; Writing – S.O., B.S.; Critical review – B.S., H.T.K.

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