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Endoscopic and histopathological features of the upper gastrointestinal system polyps: evaluation of 12.563 procedures

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ABSTRACT

Objective: With the widespread use of esophagogastroduodenoscopy (EGD) in recent years, upper gastrointestinal system polyps have started to be encountered more often. Although most patients with gastric polyps are asymptomatic, these are important due to their malign potential, and gastric cancer may develop if left untreated.

Material and Methods: Records of 12.563 patients who underwent EGD at Kartal Kosuyolu High Specialization Health Application and Research Center for any reason between January 2013 and June 2016 were reviewed retrospectively. Patients with at least 1 histopathologically proven polyp were included in this study.

Results: A total of 12.563 endoscopic procedures of the upper gastrointestinal system were investigated and 353 (2.8%) polypoid lesions were detected. Mean age of these patients was 56.3 years and 241 (68.3%) of the patients were female. Gastric polyps were found most commonly in the antrum (50.1%) and of all gastric polyps, 245 (69.5%) were less than 1 cm. Histopathological evaluation showed that hyperplastic polyp (HP) (n= 151, 42.8%) was the most common polyp type, followed by fundic gastric polyp (FGP) (n= 51, 14.4%). Non-polyp gastric mucosa evaluation of 298 patients revealed that 34.9% of the cases were *Helicobacter pylori* positive, 19.4% had intestinal metaplasia, and 11.4% had atrophic gastritis.

Conclusion: Polyps of the upper gastrointestinal system are generally detected coincidentally as they have no specific symptoms. Polypectomy is required for gastric polyps because of their potential for malign transformation according to medical evidence.

Keywords: Upper gastrointestinal system, polyp, endoscopy, hiperplastic polyp, fundic gastric polyp

INTRODUCTION

In recent years, gastric polyps have started to be encountered more often with the widespread use of esophagogastroduodenoscopy (EGD) (1). Any abnormal growths projecting above the plane of the mucosa into the lumen of the stomach are defined as ˝gastric polyps˝. Gastric polyps most frequently originate in the mucosa, which may even be submucosal or extrinsic (2,3).

Incidence rate of gastric polyps ranges from 2% to 6% during upper endoscopy and less than 1% in the general population; however, it has begun to gradually increase due to the high amount endoscopic procedures (4,5).

The British Society of Gastroenterology has classified gastric polyps into 2 different groups (6) (Table 1). The first group is epithelial polyps, such as fundic gland polyps (FGP), hyperplastic polyps (HP), adenomatous polyps (AP), hamartomatous polyps and non-hamartomatous-polyposis syndromes. The second group is non-mucosal intramural polyps, such as the gastrointestinal stromal tumor, leiomyoma, inflammatory fibroid polyp, fibroma and fibromyoma, lipoma, ectopic pancreas, neurogenic and vascular tumors, and neuroendocrine tumors (carcinoids).

It has been reported that hyperplastic polyps are the most common type especially at the areas where *Helicobacter pylori* infection is common. With the chronic use of proton pomp inhibitors (PPI) and eradication of *H. pylori*, FGP has become more common (7,8).

Most patients with gastric polyps are asymptomatic, which can be found during routine EGD. Larger polyps can cause bleeding, abdominal pain and even gastric outlet obstruction. They are important because they have malign potential and gastric cancer may develop if they are untreated (9).

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Table 1. Classification of gastric polyps (The British Society of Gastroenterology, 2009)

Epithelial Polyps	Non-mucosal Intramural Polyps
Fundic gland polyp	Gastrointestinal stromal tumor
Hyperplastic polyp	Leiomyoma
Adenomatous polyp	Inflamatoryfibroid polyp
Hamartomatous polyp	Fibromaand fibromyoma
• Juvenile polyp • Peutz-Jeghers' syndrome • Cowden's syndrome Polyposis syndromes (non-hamartomatous) • Juvenile polyposis • Familial adenomatous polyposis	Lipoma Ectopic pancreas Neurogenic and vascular tumours Neuroendocrine tumours (carcinoids)

This study aimed to present demographic, clinical, endoscopic and pathological characteristics of patients with gastric polyps and the frequency of these lesions.

MATERIAL and METHODS

Study Design

After receiving approval from the review board (Kartal Dr. Lutfi Kirdar Educational and Research Hospital Ethics Comittee, Date of Approval: 27/10/2016; Reference number: 2016.4/3-14), we retrospectively reviewed the patients who had undergone elective EGDs at Kartal Kosuyolu High Specialization Health Application and Research Center for any reason between January 2013 and June 2016. All endoscopic procedures were performed by gastroenterologists or gastroenterology surgeons. All patients had signed informed consents before EGDs. Patients with previous history of gastric resection and on whom we had performed therapeutic procedures such as sclerotherapy, endoscopic variceal ligation, percutaneous endoscopic gastrostomy or stent placement were excluded.

Patients with gastric polypoid lesions other than those with endoscopically suspected GIST or ectopic pancreas underwent polyp sampling and/or polypectomy. Endoscopic ultrasonography was performed to diagnose GIST.

Information about patients' age, gender and polyp location, size, number, histological classification and gastric mucosal changes were obtained from endoscopic and pathological reports. Histological classification of the polyps was carried out according to the guidelines of the British Society of Gastroenterology. The samples taken from normal stomach tissue surrounding polyps were evaluated in terms of *H. pylori*, chronic atrophic gastritis and intestinal metaplasia. No biopsy was done for the diagnosis of endoscopic GIST or ectopic pancreas.

Statistical Analysis

All statistical analyses were performed using SPSS (version 15, Chicago, IL ,USA). Quantitative variables were described using mean ± SD and categorical variables were described using frequency and proportion. Comparison of the categorical data between the two groups was analyzed by Chi-square test and p values < 0.05 were considered statistically significant. One-way ANOVA test was used to compare the relationship between *H. pylori*, IM and AG and three subgroup of polyps.

RESULTS

We investigated a total of 12.563 endoscopic procedures of the upper gastrointestinal system performed at our clinic within the last 3.5 years and detected 353 (2.8%) polypoid lesions. Mean age of these patients was 56.3 ± 12.8 (18-85) years and 241 (68.3%) of the patients were female, while 112 (31.7%) were male (Table 2).

While a single polyp was seen in 298 (84.5%) patients, multiple polyps were detected in 55 (15.5%). Endoscopic evaluation showed that 177 (50.1%) of the polyps were located in the antrum, 71 (20.1%) in the corpus, 43 (12.2%) in the fundus, 27 (7.6%) in the cardia, 14 (4%) in multiple areas of the stomach, and 21 (5.9%) were located either in the distal esophagus or the duodenum.

When polyp sizes, which were endoscopically measured, were classified into 3 different groups, it was seen that the number of polyps smaller than 5 mm was 120 (33.9%), the number of the ones sized between 5 to 10 mm was 125 (35.4%), and the number of the ones larger than 10 mm was 108 (30.5%).

Pathological evaluation of the endoscopic polypectomies can be seen in Table 2. Pathological investigation demonstrated that HP (n= 151, 42.8%) was the most frequently detected one followed by FGP (n= 51, 14.4%), gastrointestinal stromal tumor (n= 48, 13.6%), and polypoidfoveolar hyperplasia (n= 44, 12.5%). While 7 (2%) patients were diagnosed with adenomatous polyps, two were diagnosed with low grade dysplasia. According to the pathology results of the group referred to as "other," which had a total of 21 (5.9%) patients, 9 patients had squamous papilloma, 3 had neuroendocrine tumor, 1 had lymphangiectasis, 1 had blood-fibrin mass, and 7 had foreign-body reaction granulation tissue.

Non-polyp gastric mucosa evaluation of 298 patients revealed that 34.9% of the cases were *H. pylori* positive, 19.4% had intestinal metaplasia, and 11.4% had atrophic gastritis. When *H. pylori* positivity was investigated separately in HP, FGP, and polypoidfoveolar hyperplasia cases, it was seen that positivity was significantly higher in cases with HP (Table 3). Moreover, *H. pylori* positivity was separately evaluated according to HP sizes. There was a statistically significant relationship between polyp sizes and *H. pylori* positivity (Table 4).

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Table 2. General features of the polyps and patients with polyps as detected by endoscopy

	General	Hyperplastic Polyp	Fundic Gland Polyp	Adenoma	Polypoid Foveolar Hyperplasia	Inflamatory Fibroid Polyp	Xanthoma	GIST	Ectopic Pancreas	Other
Polyp										
n	353/12.563	151/353	51/353	7/353	44/353	11/353	4/353	48/353	16/353	21/353
%	2.8	42.8	14.4	2.0	12.5	3.1	1.1	13.6	4.5	5.9
Age	56.3 ± 12.8	58.5 ± 12.6	55.0 ± 11.9	56.7 ± 15.1	56.0 ± 9.9	51.0 ± 18.1	54.7 ± 13.3	57.3 ± 12.3	48.3 ± 14.1	51.6 ± 15.3
Gender										
Female/Male	241/112	103/48	41/10	4/3	29/15	7/4	2/2	28/20	11/5	16/5
%	68.3/31.7	31.8/68.2	80.4/19.6	57.1/42.9	65.9/34.1	63.6/36.4	50/50	58.3/41.7	68.8/31.3	76.2/23.8
No. of polyps										
Single	298 (84.5%)	144	18	5	37	9	1	48	16	20
Multiple	55 (15.5%)	7	33	2	7	2	3	-	-	1
Polyp Size										
< 5 mm	120 (33.9%)	52	27	1	26	4	2	-	4	4
5-10 mm	125 (35.4%)	50	23	4	16	6	2	-	12	12
> 10 mm	108 (30.5%)	49	1	2	2	1	-	48	-	5
Location										
Antrum	177 (50.1%)	99	1	2	32	7	3	16	12	4
Corpus	71 (20.1%)	23	21	2	2	-	1	16	3	3
Cardia	27 (7.6%)	12	4	2	3	-	-	6	-	-
Fundus	43 (12.2%)	6	24	-	6	1	-	5	-	1
Multiple gastric	14 (4.0%)	11	1	-	1	-	-	-	-	-
Other	21 (5.9%)	-	-	-	-	3	-	5	-	13
Helicobacter pylori										
Positive	101 (34.9%)	64	7	6	11	3	1	ND	ND	9
Negative	188 (65.1%)	87	44	1	33	8	3	ND	ND	12
Intestinal metaplasia	56/289 (19.4%)	35/151	3/51	6/7	7/44	2/11	1/4	ND	ND	2/21
Atrophic gastritis	33/289 (11.4%)	23/151	1/51	5/7	3/44	-	-	ND	ND	1/21

GIST: Gastrointestinal stromal tumor, ND: Non diagnosed.

Table 3. Relationship between *Helicobacter pylori*, IM and AG and three types of polyps

	Hyperplastic polyp	Fundic gland polyp	Polypoid foveolar hyperplasia	p
Helicobacter pylori				
- Positive	64	7	11	< 0.05*
- Negative	87	44	33	
Intestinal metaplasia (IM)	35/151	3/51	7/44	-
Atrophic gastritis (AG)	23/151	1/51	3/44	-
* Statistically significant.				

Table 4. Relationship between *Helicobacter pylori* and size of hyperplastic polyps

Polyp size	Hyperplastic polyp *H. pylori* +	Hyperplastic polyp *H. pylori* –	p
< 5 mm	16	36	0.001*
5-10 mm	17	33	
> 10 mm	31	18	
Total	64	87	
* Statistically significant.			

DISCUSSION

As polyps of the upper gastrointestinal system are generally small and asymptomatic, they are coincidentally detected by EGDs performed for other purposes. Although the incidence of polyps and their histopathological features vary according to different geographical areas, it is seen in about 0.8-2.4% of the general population. While the rate of polyps randomly detected in upper endoscopy procedures performed for other purposes was stated to be 2.2% in a large series conducted in our country, the same rate was reported to be 2.6% in Far Eastern countries, and 6% in the US (8,10,11). The main reason of the differences seen among geographical areas pertains to *H. pylori* prevalence and PPI use. The rate of polyps detected by endoscopies in our study was 2.8% and this result was in line with the literature data.

Mean age of the patients detected to have polyps was 56.3, and mean age figures among the groups were similar. Other studies in the literature have also reported that patients of a similar age group frequently had gastric polyps.

A great majority of the patients diagnosed to have polyps within the scope of the study was female (68%). Many studies conducted in our country reported that polyps were seen more frequently in the female population and this rate varied between 58 and 67% (12,13). It was suggested that this rate was higher in our study as the number of female patients was higher as well. No statistically significant relationship, however, was found between the histopathological features of polyps and gender ($p< 0.05$).

Data offered by studies in the literature suggest that gastric polyps are generally singular, located in the antrum, and are smaller than 1 cm (14). The results of our study also revealed that they were singular in 84% of the patients, located in the antrum in about half of them, and a great majority (70%) was smaller than 1 cm.

Although there is no consensus on the ways in which asymptomatic polyps should be approached in the general literature, the general approach of endoscopists is to take biopsy samples from the polyp and perform polypectomy depending on the pathology results. The preferred mode of treatment in our own clinic is to excise or sample all polyps especially larger than 5 mm accompanied by snare or with hot biopsy forceps. Muehldorfer et al. have found out remarkable differences only between the pathology results of polyp biopsies and polypectomy specimens when they were compared and suggested polypectomy be performed on polyps larger than 5 mm (15).

HPs are the kind of polyps seen most frequently among all benign gastric polyps and are generally smaller than 2 cm, singular, sessile or pedicled, frequently located in the antrum but can be seen in all gastric localizations (6). Chronic atrophic gastritis and *H. pylori* positivity and association are often seen in gastric mucosa samples accompanying HP (16). The results of our study did not only reveal a statistically significant relationship between HP and *H. pylori* positivity but also a significant relationship between polyp size and *H. pylori* positivity (Tables 3,4).

Though rare, there can be malign transformations in HPs, which proves to be significant as there can be a possible increase in the risk of associated synchronous cancer development. Some sources cite the rate of malign transformation to be between 1.9 and 19% (17). It has been reported by some investigators that increased size of the polyp (> 1 cm) increases the risk of

malignant transformation and p53 genetic mutation is effective in this transformation (18). Similarly, some researchers have reported that the risk of cancer development in the surrounding gastric mucosa is higher than the polyp itself in HP cases and multiple biopsies should definitely be taken from the surrounding mucosa (6). In our study group, adenomatous changes were seen in 6 patients (3.9%) but no malign transformations were detected in the pathological evaluation of the surrounding gastric mucosa.

FGPs, on the other hand, are polyps which account for 16-51% of epithelial polyps and can be associated with sporadic or familial adenomatous polyposis (FAP) syndrome, are mostly smaller than 1 cm and located in the gastric corpus and fundus (19). In a study by Weston et al., the authors have stated that correct diagnosis can be established with a high probability through observation by a single endoscopist (20). Its pathogenesis is not known clearly. Dysplasia development is lower than 1% in sporadic fundic gland polyps and there is no relationship between atrophic gastritis and *H. pylori* (21).

There is adenomatous polyposis coli (APC) genetic mutation in FAP-related FGP cases and multiple polyps covering the whole gastric corpus are seen in these cases. The risk of malign transformation is quite high in FAP-related FGPs (25-41%) in comparison to the sporadic form (22). Furthermore, it has been suggested that colon involvement should also be investigated in these cases. There is, however, no adequate data in the literature as to the number of gastric polyps to be suspicious of FAP. There are studies which recommend sigmoidoscopy especially for patients under the age of 40 with multiple FGPs and for cases whose pathology results indicate dysplasia existence (6,23).

When the studies published in Turkey were taken into consideration, it was seen that the number of HPs in our study was lower than other studies, whereas the number of FGPs was higher (Table 5). We think that the reason for this discordance is related to the fact that the patients in our hospital were on antiaggregant therapy for their cardiac comorbidities alongside with regular use of PPI and the gradual yearly increase in PPI administration in the general population. Although previous studies have reported that *H. pylori* positivity in patients with gastric polyps was about 50-70% in Turkey, we found *H. pylori* positivity to be 34.9% in our study probably because of the same reason (12,24).

While there is a relationship between FGP formation and chronic PPI administration according to some authors, there is no such relationship according to many others. The inverse relationship between FGP and *H. pylori*, however, is clearly known (25-27). The subgroup evaluation conducted within the scope of our study revealed that there was a statistically significant high rate of *H. pylori* positivity in HPs, whereas there was no relationship between the two in FGPs (Table 3).

APs are true neoplasms which are the precursors of gastric cancers. They account for 3-26% of benign epithelial gastric polyps and are mostly singular, smaller than 2 cm, can be seen in all areas of the stomach but are more often localized in the antrum (28). When the surrounding gastric mucosa is scrutinized it is seen that most of it is associated with atrophic gastritis and intestinal metaplasia. It has no proven relationship to *H. pylori*. Although various studies have reported that the neoplastic transformation is between 6 and 47%, this rate is higher in polyps larger than 2 cm (29,30). In our study group, 2 out of 7 patients (28.5%) had low grade dysplasia. It has been suggested that all parts of the stomach should be carefully investigated for mucosal anomalies in cases with adenomatous polyps and a control EGD should be conducted after 6 months if incomplete polypectomy was performed (6).

Table 5. Comparison with other studies in the literature

Author	Country	Year	Number of polyps (%)	Hyperplastic polyp	Fundic gastric polyp	Adenomas	*Helicobacter pylori*	Atrophic gastritis	Intestinal metaplasia
Carmack et al. (8)	USA	2009	7.877/12.564 (6.5%)	17%	77%	0.7%	2.2%	22%	4.9%
Sonnenberg et al. (7)	USA	2015	71.575/812.926 (8.8%)	18.5%	79.9%	0.9%	1.34%	0.7%	2.1%
Cao et al. (1)	China	2012	254/24.121 (1%)	28.3%	50.6%	0.05%	42.2%	-	-
Fan NN et al. (11)	China	2015	4.043/157.902 (2.5%)	25%	65%	1.8%	4.6%	-	-
Gencosmaoglu et al. (12)	Turkey	2003	91/2.630 (3.4%)	46%	14%	2.7%	49%	-	36%
Sezikli et al. (14)	Turkey	2014	123/6.607 (1.8%)	65.9%	0.8%	10.6%	32.5%	-	-
Büyükaşık et al. (24)	Turkey	2015	59/55.987 (0.1%)	69%	3.3%	6.7%	68.2%	56%	39%
Atalay et al. (13)	Turkey	2015	174/14.240 (1.2%)	83.9%	6.1%	7.4%	-	-	-
Vatansever et al. (10)	Turkey	2015	666/29.940 (2.2%)	36.2%	8.3%	1.9%	-	-	-
Present study	Turkey	2016	353/12.563 (2.8%)	42.8%	14.4%	2.0%	34.9%	11.4%	19.4%

When the malign transformation potential of polyps and their similarities during endoscopic procedures are taken into consideration, the British Society of Gastroenterology suggests that all polyps larger than 5 mm should be completely excised or sampled if possible. The British Society of Gastroenterology also suggests that at least 2 biopsies should be conducted for polyps smaller than 1 cm, while 4 or more biopsies should be done for polyps larger than 1 cm in cases where total polypectomy is not viable. It has been proposed that endoscopic control should be carried out following 1 year after total polypectomy in HPs, and it has been reported that no follow-ups are necessary in patients diagnosed with HP but were seen to have no polyps at the end of the first year and in FGP cases (6).

Study Limitations

The limitations of this study include its retrospective design, single center and the absence of stomach mucosa specimens around the polyp in some patients.

CONCLUSION

Polyps of the upper gastrointestinal system are generally detected coincidentally as they have no specific symptoms and prove to be significant because of their potential for malign transformation. Although their endoscopic images vary, they do not provide physicians with clear information on their pathology. Polypectomy should be performed for the ones which can be excised when they are detected, and follow-up should be carried out following the performance of biopsies with an adequate number and depth for polyps which cannot be removed.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethics Committee of Kartal Dr. Lutfi Kirdar Training and Research Hospital (2016.4/3-14).

Informed Consent: Informed consent was not received due to the retrospective nature of the study.

Peer-review: Externally peer-reviewed.

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Üst gastrointestinal sistem endoskopisinde saptanan poliplerin endoskopik ve histopatolojik özellikleri: 12.563 işlemin değerlendirilmesi

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ÖZET

Giriş ve Amaç: Son yıllarda özefagogastroduodenoskopi (ÖGD)'nin yaygın olarak kullanılması ile birlikte üst gastrointestinal sistem poliplerine daha sık rastlanmaktadır. Gastrik poliplerin çoğu asemptomatik olmakla birlikte, malignite potansiyeli taşıdıkları için önemlidir ve tedavi edilmezse gastrik kanser gelişebilir.

Gereç ve Yöntem: Ocak 2013-Haziran 2016 tarihleri arasında herhangi bir nedenle Kartal Koşuyolu Yüksek İhtisas Eğitim ve Araştırma Hastanesinde ÖGD yapılan 12,563 hasta retrospektif olarak kayıt edildi. Histopatolojik olarak kanıtlanmış en az bir polibi bulunan hastalar çalışmaya dahil edildi.

Bulgular: Kliniğimizde son 3,5 yılda yapılan 12,563 üst gastrointestinal sistem endoskopisi incelenmiş olup 353 (%2,8)'ünde polipoid lezyon saptanmıştır. Ortalama yaş 56,3 ± 12,8 18-85 yaş) idi ve hastaların 241(%68,3)'i kadın, 112 (%31,7)'si erkekti. Endoskopik incelemede poliplerin çoğu antrumda (%50,1) ve 1 cm'nin altında (69,5%) idi. Patoloji değerlendirmesinde en sık hiperplastik polip (HP) (n= 151, %42,8) ve fundik gastrik polip (FGP) (n= 51, %14,4) saptandı. 298 hastada polip dışı gastrik mukoza değerlendirilmesinde olguların %34,9 unda *H. pylori* pozitifliği, %19,4'ünde intestinal metaplazi ve %11,4'ünde ise atrofik gastrik saptandı.

Sonuç: Üst gastrointestinal sistem poliplerine özgü bir semptom olmaması nedeniyle genellikle tesadüfi olarak saptanırlar. Malign dönüşüm potansiyeli var olduğundan saptandıkları zaman polipektomi yapılması gerekmektedir.

Anahtar Kelimeler: Üst gastrointestinal sistem, polip, endoskopi, hiperplastik polip, fundik gastrik polibi

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