

## Gastric Polyps: A Retrospective Analysis of Endoscopic Biopsies: A Single Center Study in Central Anatolia

Gastrik Polipler: İç Anadolu'da Tek Merkeze ait Endoskopik Biyopsilerin Retrospektif Analizi

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### ABSTRACT

**Objective:** Gastric polyps accounts for %6 of gastrointestinal endoscopy. Geographical differences occur in the prevalence of them. We aimed to determine the spectrum of gastric polyps.

**Material and method:** Data including demographics, medical history and histological characteristics of polyps and *Helicobacter pylori* were obtained retrospectively.

**Results:** Of the 24568 endoscopies performed, 184 patients were identified as having gastric polyps. The most frequently encountered were hyperplastic polyps (62%), followed by fundic gland polyps (19,3%) and adenomatous polyps (3, 8%). The corpus (36,4 %) was the most common site and the antrum (25%) was the second. Female patients were more affected than male patients (64,7%). Majority of the polyps (88%) were smaller than 1 cm in diameter. The mean age was 62,10+13,4 (range:30-90) years. Fundic gland polyps were observed at younger age (mean age: 56,58) compared to other gastric polyps. Intestinal metaplasia was more frequently encountered in hyperplastic polyps than in fundic gland polyps.

**Conclusion:** In this study, hyperplastic polyps are the most common in our population however there was no association between the hyperplastic polyps and *H. pylori* infection. *H. pylori* infection ratio was similar in both hyperplastic polyps and fundic gland polyps however all of the patient have chronic gastritis. This findings suggest chronic gastritis also play role in hyperplastic polyps development. The study also showed that *H. Pylori* infection is still common in our country and further studies need to find efficacy of *H.pylori* treatment.

**Key Words:** Gastric polyps, H. Pylori, epidemiology, retrospective

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### ÖZET

**Amaç:** Gastrik polipler gastrointestinal endoskopilerin% 6 'sında izlenmektedir. Gastrik polip prevalansı coğrafi farklılıklar gösterir. Çalışmamızda gastrik polip spektrumunun belirlenmesi amaçlanmıştır.

**Yöntem:** Gastrik poliplerin histopatolojik özellikleri, olgulara ait demografik özellikler ve klinik öykü ile *Helicobacter pylori* varlığı retrospektif olarak tespit edilmiştir.

**Bulgular:** 24568 endoskopinin 184'ünde gastrik polip tespit edildi. En sık rastlanan polip; hiperplastik polip (% 62) olup bunu fundik gland polibi (% 19,3) ve adenomatoz polipler (%3, 8) izlemektedir. Gastrik polipler en sık korpus (% 36,4) ve ikinci sıklıkla antrumda (% 25) lokalizeydi. Kadın hastaların(% 64,7) erkek hastalardan daha fazla etkilendiği görüldü. Gastrik poliplerin çoğunluğu (% 88) 1 cm'den küçüktü. Yaş ortalaması 62,10 + 13,4 (yaş dağılımı: 30-90yaş) idi. Fundik gland polibinin diğer gastrik poliplere göre daha genç yaşta (ortalama yaş 56,58) ortaya çıktığı gözlemlendi. Hiperplastik poliplerde fundik gland poliplerinden daha sık intestinal metaplazi görüldü.

**Sonuç:** Bu çalışmada, hiperplastik poliplerin popülasyonumuzda en yaygın olduğu bulunmakla birlikte hiperplastik polipler ve *H. pylori* enfeksiyonu arasında bir ilişki bulunamamıştır. *H. pylori* enfeksiyon hem hiperplastik poliplerde hem de fundik bez poliplerde benzer orandadır ve tüm poliplerde kronik gastrit varlığı izlenmiştir Bu bulgu, hiperplastik polip gelişiminde kronik gastritin de rolünü desteklemektedir. Çalışma ayrıca *H. Pylori* enfeksiyonunun ülkemizde hala yaygın olduğunu ve *H. pylori* eradikasyon tedavisinin ülkemizdeki etkinliğinin belirlenmesi için daha ileri çalışmalarla ihtiyaç olduğunu göstermiştir.

**Anahtar Sözcükler:** Gastric polip, H. Pylori, epidemioloji

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**INTRODUCTION**

Gastric polyps are usually discovered incidentally in approximately 2 % of upper gastrointestinal endoscopies (1). Widespread use of endoscopy has resulted in increased detection of gastric polyps. Polyps are defined as mucosal proliferations that grow from the normal mucosa and project into the lumen. Gastric polyps may develop because of epithelial or stromal cell hyperplasia, inflammation, ectopia or neoplasia. They can be classified according to predominant cell types: epithelial polyps which are the "classical" gastric polyps (hyperplastic polyps, fundic gland polyps and adenomatous polyps), mesenchymal proliferations (including gastrointestinal stromal tumors (GIST), leiomyoma and lipoma), clusters of endocrine cells (carcinoids), and infiltrates (xanthomas, and lymphoid proliferations). Although the vast majority of gastric polyps consist of non-neoplastic lesions some gastric polyps tend to have malignant transformation to cancer. Gastric cancer is one of the most frequently occurring cancers in the world and the second most common cause of cancer-related death (2). Thus, the diagnosis and treatment of gastric polyps should become important. In addition frequency and the types of gastric polyps vary depending upon the population being studied.

In the present study we aim to evaluate the spectrum of gastric polyps in the our patient population by reviewing a 10-year database of histopathologic reports. We also hypothesized that their relation with specific features such as age, sex, subsite distribution and prevalence. We also investigated the correlations between the "classical" gastric epithelial polyps and underlying gastric conditions such as *H. pylori* infection, gastric atrophy and intestinal metaplasia.

**MATERIALS and METHODS**

Between 2002 and 2014, 24568 upper gastrointestinal endoscopies were performed at Baskent University, Konya Hospital, Gastroenterology Department. Among these endoscopic biopsy specimens, a total of 184 biopsies were identified as gastric polyps. The specimens were received in 10% buffered formalin and processed in auto processors. Paraffin embedded sections were stained using the routine hematoxylin and eosin method. We analyzed the pathology reports of all patients who had undergone endoscopic polypectomy or biopsy sampling and who were diagnosed with gastric polyps. The specific data including subsite localization, size, sex and age of the patients were obtained from the patient reports and recorded according to histologic types of gastric polyps. Beside gastric polyp biopsy, multiple biopsies were taken from normal gastric mucosa in each patient and the histological features were scored in accordance with the Sydney system for the classification of chronic gastritis.

*H. pylori* colonization were determined with Giemsa staining. The presence of *H. pylori* infection and environmental metaplastic atrophic gastritis were also recorded. A detailed data having been recorded when patients come to the gastroenterology policlinic were reviewed. Data includes also medication of PPIs, initiation of PPIs, mean duration of PPI use and *H. Pylori* eradication.

Gastric polyps were categorized as "classical" gastric polyps, namely gastric epithelial polyps (hyperplastic polyps, fundic gland polyps and adenomatous polyps) or other types of polyps (leiomyoma, xanthoma, ectopic pancreas, carcinoid, and GIST) according to histopathological diagnosis.

Statistical analyses were performed using the SPSS software (version 20.0). Descriptive statistics were presented using frequencies and ratios for categorical variables and for "age" variable. The results are presented in tables. Between group comparisons were not performed, since the number of patients are not distributed equally.

**RESULTS**

**Types of polyps:** In this study, we identified gastric polyps in 184 patients, which represented 0,81 % of all patients who underwent upper gastrointestinal endoscopy (24568 patients). In the "classical" gastric epithelial polyps group, hyperplastic polyps were the most common (62%), followed by fundic gland polyps (19,6%) and adenomatous polyps (3,8%). Among other polypoid lesions group, gastric carcinoid (4,9%) and xanthoma (4,9%) were the most common lesions.

**Sex:** In our study we found that female patients were more frequently affected than male patients. Of the 184 patients, 119 (64,7%) were women and 65 (34,3%) were men. There was also a female predominance in "classical" gastric epithelial polyps (105 women vs 52 men). The female/male ratio for hyperplastic polyps and fundic gland polyps was 2.5:1 and 1.4:1, respectively.

**Age:** The statistical analysis indicates that the mean age of the patients was 62,10+13,4 (range:30-90) years. Our results also showed that fundic gland polyps were observed at younger age (mean age: 56,58) compared to the age at which hyperplastic polyps (mean age:63,37) and adenomatous polyps (mean age: 70,29) occurred.

**Site of polyps:** In our study, the most frequent site of gastric polyps was corpus 36,4 % (n:67) and followed by antrum 25 % (n:46), cardia 22,3 % (n: 41), fundus 15, 2% (n:28) and pylorus 1,1%(n:2). We also found that all types of gastric epithelial polyps mostly located in the corpus (31,5% of hyperplastic polyps, 47,2% of fundic gland polyps, 42,8 % of adenomatous polyps) The specific characteristics of gastric polyps such as age, sex and location are shown in Table 1.

**Table 1:** Specific charecteristic of gastric polypoid lesions according to histopathologic diagnosis.

	Total patients		Mean age	Gender		Cardia	Fundus	Location		
				Female	Male			Corpus	Antrum	Pilor
<b>"Classical" Gastric epithelial polyps</b>										
Hyperplastic polyps	114	62.0%	63,37	80	34	32	10	36	34	2
Fundic gland polyps	36	19,6%	56,58	20	16	4	13	17	2	0
Adenomatous polyps	7	3.8%	70,29	4	3	1	1	3	2	0
<b>Other polypoid lesions</b>										
Xanthoma	9	4.9%	60,25	5	4	1	2	1	5	0
Leiomyoma	2	1.1%	66	2	0	1	0	1	0	0
GIST	7	3.8%	62,28	3	4	0	2	2	3	0
Carcinoid	9	4.9%	62,66	5	4	2	0	7	0	0

**Size:** A majority of polyps (88%, n:152) were smaller than 1 cm in diameter, while only six polyps were larger than 2cm in diameter. We noticed that fundic gland polyps tend to be smaller than hyperplastic polyps (94% of fundic gland polyps <1 cm, 84% of hyperplastic polyps <1 cm). Adenomatous polyps were bigger in size than other types of polyps.

The polyps which are smaller than 5mm in diameter, were mostly seen in the cardia and most of them were hyperplastic polyps. We also determined that larger hyperplastic polyp incidence increases with patients age however there were no statistically significant correlations between polyp size and age. We have no found any association between the types of polyps and age, sex or size. Table 2 shows the distribution of gastric polyps size according to histopathologic diagnosis and Table 3 shows the distribution of gastric polyps size according to anatomic location of polypoid lesions.

**Table 2:** Relationship between gastric polypoid lesions and size; the values indicate number of cases

	Hyperplastic Polyps (n)	Fundic gland polyps (n)	Adenomatous Polyps (n)	Xantoma (n)	Leiomyoma (n)	GIST (n)	Carcinoid
0-5 mm	37	19	0	9	0	0	2
6-10 mm	59	15	3	0	2	1	5
11-15 mm	14	1	2	0	0	2	1
16-20 mm	3	1	1	0	0	0	1
21-25 mm	0	0	1	0	0	1	0
26-30 mm	1	0	0	0	0	3	0
	114	36	7	9	2	7	9

**Table 3:** Relationship between polyp size and anatomic location ; the values indicate number of cases and percentage.

	<5mm		6-10 mm		11-15 mm		16-20 mm		21-25mm		26-30mm		Total	
<b>Cardia</b>	23	56,1%	17	41,51%	1	2,39%	0		0		0		41	100%
<b>Fundus</b>	14	50%	12	42,86%	1	3,57%	0		0		1	3,57%	28	100%
<b>Corpus</b>	19	28,4%	34	50,7%	8	11,9%	3	4,5%	1	1,5%	2	3%	67	100%
<b>Antrum</b>	10	21,7%	21	45,7%	10	21,7%	3	6,5%	1	2,2%	1	2,2%	46	100%
<b>Pilor</b>	1	50%	1	50%	0		0		0		0		2	100%

*H. Pylori:* Among the 114 patients with hyperplastic gastric polyps and fundic gland polyps, *H. pylori* colonization was detected in 26 patients (22,8%) with hyperplastic polyps and 9 patients (25%) with fundic gland polyps.

*Intestinal metaplasia:* Intestinal metaplasia was detected in the adjacent gastric mucosa in 24,6% of hyperplastic polyps, 13,9 % of the fundic gland polyps and 42,9 % of adenomatous polyps.

*Chronic gastritis and Atrophy:* In the present study, we determined that all gastric polyp patients exhibited chronic gastritis histopathologically. We found that the adjacent gastric mucosa have exhibited atrophy in 29,82% of hyperplastic polyps and in 57,14 % of adenomatous polyps. Table 4 shows the rates of *H.pylori* infection and intestinal metaplasia as well as gastric atrophy status.

**Table 4:** Histopathologic features of adjacent gastric mucosa according to histologic type of gastric polyps

	H.Pylori	%	Atrophy	%	Intestinal metaplasia	%
<b>Hyperplastic polyps</b>	26/114	22,8	34/114	29,8	28/114	24,6
<b>Fundic gland polyps</b>	9/36	25,0	5/36	13,9	5/36	13,9
<b>Adenomatous polyps</b>	2/7	28,6	4/7	57,1	3/7	42,9

There was no statistically significant relation between the polyp types and *H.pylori* infection, gastric atrophy, intestinal metaplasia.

*Dysplasia:* In our study, no dysplastic change or malignancy was found in hyperplastic polyps and fundic gland polyps however high-grade dysplasia was only seen in one of adenomatous polyps.

## DISCUSSION

In the current study we presented the findings of a retrospective analysis of gastric polyps, which were diagnosed at the Baskent University Hospital, over a ten year period. Gastric polyps are found in approximately 6 percent of upper gastrointestinal endoscopic procedures in the United States(3). However, lower rates have been reported in other countries. Frequency and the types of gastric polyps vary depending upon the population being studied. In our study, the prevalence of gastric polyps (0,83%, 184 patients with gastric polyps in 24568 endoscopies) was similar to the findings of studies from Greek and Brasil, 1,2% ( 157 patients with gastric polyps in 12974 endoscopies) and 0.58% (153 patients with gastric polyps in 26,000 endoscopies), respectively (4,5). Similar prevalence rate has also been reported in Turkey, before (6,7). Recent investigation in China showed that the detection rate of gastric polyps was 3,1% ( 2125 patients with gastric polyps in 69575 endoscopy) (8).

"Classical" gastric epithelial polyps were the most frequently assessed polyps in our study. We found that the majority of polyps were hyperplastic polyps(62%) followed by fundic gland polyps (19,6%) and adenomatous polyps (3,8% ). Other studies from Turkey also reported that hyperplastic polyps were the most commonly observed polyps however there are differences in prevalence rates (9-11).

Hyperplastic polyps are thought to result from excessive regeneration of foveolar epithelium after mucosal damage. They account for up to 75 % of gastric polyps in the geographic areas where *H. pylori* infection is common (12).

Beside arising in a background of *H. pylori* infection, hyperplastic polyps also occur in previously damaged gastric mucosa, reactive or chemical gastritis when adjacent to ulcer erosions and around gastroenterostomy stomas or autoimmune gastritis (7). Conversely, fundic gland polyps can be sporadic or associated with familial adenomatous polyposis (FAP) and affect patients receiving long-term treatment with proton-pump inhibitors (PPI).

Recent studies showed that the gastric polyp spectrum has changed, with an increasing prevalence of fundic gland polyps. It is believed that *H. pylori* eradication and use of PPI is associated with higher incidence of fundic gland polyps in western populations. Regression of hyperplastic polyps has as many as 71% of patients with *H. Pylori* infection after eradication of bacteria (13-15). In United States, latest published retrospective study confirmed that fundic gland polyps were the highest prevalence of gastric polyps, and hyperplastic polyps were the second, 7.72% and 1.79% of patients, respectively (16). Similar changes in the spectrum of gastric polyp has also been reported in the Northern Chinese population (17). Recently, a study reported that there is also a decrease in *H. Pylori* seroprevalence in Turkey (18). On the other hand, in the study from Korea, authors pointed out that the incidence of fundic gland polyp are lower than Western reports, but that of gastric adenoma and gastric cancer is relatively high, similar to previous Asian reports(19). In East Asian where *H. pylori* infection remains high, larger proportions of gastric polyps are still hyperplastic(20).

Our results showed that *H. pylori* colonization was detected in 26 patients (22,8%) with hyperplastic polyps and in 25% of fundic gland polyps. *H. pylori* infection rates in patients with hyperplastic polyps were not significantly different than in patients with fundic gland polyps and adenomatous polyps. In our study more than %70 of gastric polyp patients had previously undergone eradication therapy to eliminate *H. pylori*. In addition, most patients had a prolonged history of gastric symptoms with history of treatment with PPI, antacids, or H2 receptor antagonists. While we believe that PPI administration has become common in our patients however we cannot obtain precise data about the duration of PPI treatment.

Chronic gastritis was a constant feature in the adjacent mucosa in all of the our cases. In literature gastric hyperplastic polyps have reported to be the mark of the beginning of a progression from chronic gastritis to intestinal metaplasia and gastric atrophy, however gastric adenoma reflect later stages of this process. Although hyperplastic polyps were believed to be benign lesions not associated with the risk of malignant transformation authors have reported dysplastic changes and/or foci of gastric adenocarcinoma harboured within hyperplastic polyps, recently(21,22). It is important to know that both polyps and gastric mucosa adjacent the polyps have an increased risk of cancer development. The risk of focal gastric cancer is five-fold higher in gastric adenomatous polyps than in the hyperplastic ones (10% vs 2.1%), and 2-fold higher in gastric mucosa surrounding the adenomatous than hyperplastic polyps (13.3% vs 7.1%). Therefore performing biopsy of the adjacent gastric mucosa should be performed for further assessment. Our results indicated that atrophy and intestinal metaplasia in the adjacent gastric mucosa is more common in adenomatous polyps and hyperplastic polyps compare to fundic gland polyps however we have no found dysplasia in hyperplastic polyps and fundic gland polyps. The risk of dysplasia in sporadic fundic gland polyps is rare, while it occurs in 30%-50% of FAP-associated polyps (23,24,25).

In our study, most of the hyperplastic polyps and fundic gland polyps were approximately 1cm in diameter while gastric adenomas were approximately 5 to 8 cm in diameter. We determined that fundic gland polyps tend to be smaller than hyperplastic polyps. Our results also showed that the size of polyps increases with increasing age, in hyperplastic polyps. A size greater than 1 cm and pedunculated morphology have been identified as risk factors for dysplasia in hyperplastic polyps. Guidelines recommend polypectomy of all gastric hyperplastic polyps greater than 0,5 cm to 1 cm (26). Similarly adenomatous polyps that are greater than 2 cm and retain a villous histology have a higher risk for developing neoplasia (28 %-40%) (27). The statistical analysis indicates that the mean age of the patients was 62,10+13,4 (range:30-90) years. Our results also showed that fundic gland polyps were observed at younger age (mean age: 56,58) compared to the age at which hyperplastic polyps (mean age:63,37) and adenomatous polyps (mean age: 70,29) occurred. Authors found that age spectrum has changed in gastric polyps, they reported that patients aged 45-59 have currently twice more gastric polyps than 10 years ago, but the inverse relationship is observed for patients aged 60 years and over(28). Authors also reported that location of gastric polyps has changed in the past 10 years; the incidence of polyps has increased in the stomach body (19% vs 32%) and decreased in the antrum (46% vs 24%) (17). In our patient population, most gastric polyps were detected in the corpus.

In the present study, we observed that gastric epithelial polyps were more frequently detected in women; however it is known that men and women are equally affected. The female to male ratio was more than two-thirds in hyperplastic polyps, and was equal in fundic gland polyps.

These findings are similar to other studies that have reported a slight predisposition in women, where in women comprised 58-70,5% of patients (12) however there are also studies that have indicated a male predominance (14).

We have also investigated lesions with a polypoid appearance which includes gastrointestinal stromal tumors (GISTs), leiomyomas, lipomas, and other subepithelial lesions. In this group, our results showed that carcinoids were the most common lesions (49%) followed by gastric xantomas(22%). These lesions are commonly associated with chronic gastritis. In our study all patients experienced chronic gastritis however carcinoids may also be associated with chronic autoimmune atrophic gastritis and pernicious anemia or Zollinger-Ellison syndrome and multiple endocrine neoplasia (29,30).

There are some limitations in of our study due to its retrospective nature, limiting the access to patient's endoscopic and clinical data. Although the diagnosis of polyps was confirmed histologically in all cases, no exact / certain data were available regarding use of PPI status and *H. Pylori* eradication therapy.

In conclusion, we evaluated the spectrum of gastric polyp developments in our study population by reviewing a 10-year database. Although this study presents the results of single center, it involves a relatively large number of patients. Knowing the specific and characteristic features of gastric polyps may help the clinicians to evaluate and management of gastric polyps. In the current study showed that overwhelming majority of gastric polyps were hyperplastic polyps. *H. pylori* infection rates were similar in patients with hyperplastic polyps and fundic gland polyps. On the other all gastric epithelial polyps arise in a background of chronic gastritis. Chronic gastritis may also related to intestinal metaplasia and atrophy therefore clinicians should consider that the excision of the polypoid lesion always should be accompanied by additional sampling of the unaffected mucosa to obtain reliable information about severity of the background gastritis.

Further prospective or retrospective multicenter studies may allow us to explore mechanisms of the origin and the spectrum of gastric polyps in the population of our country. We believe that retrospective studies performed in long term period should provide more information about the gastric polyp spectrum and effect of geographical differences on the prevalence of gastric polyps.

#### Conflict of interest

No conflict of interest was declared by the authors.

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