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Original Article GASTROENTEROLOGY

# Polypoid lesions detected in the upper gastrointestinal endoscopy: A retrospective analysis in 19560 patients, a single-center study of a 5-year experience in Turkey

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## ABSTRACT

**OBJECTIVE:** In our study, we aimed to evaluate the endoscopic features such as prevalence and localization of polypoid lesions determined by us using esophagogastroduodenoscopy and histopathological characteristics of biopsy specimens taken in detail.

**METHODS:** The data of 19,560 patients undergoing upper gastrointestinal endoscopy for any reason between 2009 and 2015 in our endoscopy unit were screened retrospectively and endoscopic and histopathological findings were analyzed in detail.

**RESULTS:** In our study, the polypoid lesion was detected in 1.60% (n=313) of 19,560 patients. The most common localization of the polypoid lesions was determined to be gastric localization (n=301, 96.2%) and antrum with a rate of 33.5% (n=105). When 272 patients in whom biopsy specimen could be taken was investigated, the most frequently seen lesion was polyp (n=115, 43.4%). Hyperplastic polyps (n=81, 29.8%) were the most frequently seen type among all polyps. In histopathological evaluation of the lesions, the prevalence rates of intestinal metaplasia (IM), surrounding tissue IM, atrophy, dysplasia, and neoplasia (adenocarcinoma, squamous cell carcinoma, gastrointestinal stromal tumor, neuroendocrine tumor, and metastatic tumor) among premalignant lesions were determined to be 16.9%, 11.2%, 4.1%, 1.1%, and 3.7%, respectively.

**CONCLUSION:** Polypoid lesions can be seen in endoscopic investigations. In histopathological investigations, while the vast majority of these lesions are benign polyps, some of them are diagnosed as premalignant or malignant lesions. In our study, we determined malignant lesions higher than the similar studies in the literature. This condition shows how effective endoscopic procedure and histopathological evaluation are of vital importance.

*Keywords: Endoscopy; histopathology; polypoid lesion.*

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Upper gastrointestinal (GI) endoscopy is commonly performed for the determination of the causes of the symptoms and for screening and surveillance of neoplasia. Polypoid lesions and polyps refer to mass lesions protruding into the lumen from the mucosal surface, are usually small and asymptomatic, and discovered incidentally on endoscopic examination [1, 2]. The patients can be asymptomatic (>90%) or they may present with nonspecific complaints such as abdominal pain, discomfort, and bloating [3]. With current advances in endoscopic and endosonographic techniques, it is seen that the prevalence of polypoid lesions is higher than expected [4, 5]. According to the classification offered by Oberhuber and Stolte, polypoid lesions are divided into five groups as follows: Non-neoplastic polyps, hamartomatous polyps, heterotopic polyps, and polyps such as neoplastic adenoma and reactive polypoid lesions [6].

We will focus more on gastric polypoid lesions and gastric polyps, because gastric polypoid lesions are most frequently detected in upper GI endoscopies. The vast majority of polypoid lesions is composed of gastric polyps. Gastric polyps in the general population are approximately 0.6–6% of upper GI endoscopy. Polyp term is defined as a proliferative or neoplastic lesion. Advanced histological features (≥25% villous features, high grade dysplasia [HGD], or cancer), size (≥1 cm), and count are the factors to increase the risk of transformation of adenomatous polyps (APs) into a malignancy [6–9]. Gastric polyps are a heterogeneous group of epithelial and subepithelial lesions (SELs). The major groups of gastric polyps hyperplastic polyps (HPs) and fundic gland polyps (FGPs) and a small part of them are comprised APs [10–13]. FGPs are one of the most common polyps found in the stomach (47%), observed in 0.8–23% of all endoscopies. Sporadic FGPs are sessile polyps located in the corpus and fundus. The HPs are the second most common gastric polyp after the FGP. HPs are usually sessile or pedunculated, and typically occur in the antrum, although they can arise anywhere [9, 14–17]. Gastric adenomas (APs), or gastric polypoid dysplasia, are true neoplasms and precursors to gastric cancer. Although commonly seen in countries with high gastric cancer rates, they also account for 6–10% of all gastric polyps in Western populations. Frequently solitary, they are most commonly found in the antrum but can be located anywhere in the stomach [9, 18–21]. Patients with advanced stages of atrophic gastritis and intestinal metaplasia (IM) should be followed up with a high-quality endoscopy every 3 years. In patients with dysplasia surveillance within 6 months (if high-grade dysplasia) to 12 months (if low-grade dysplasia [LGD]) are recommended [22]. A lot of studies report were reported that the most common location for upper GI endoscopy polypoid lesions was the antrum, followed by the corpus, fundus, and cardia. A total of 55,987 diseases published from our country are present in a large study; the most common stomach (antrum 43.9%, corpus 22.7%, cardia 16.7%, and fundus 4.54%), duodenum (7.57%) and esophagus, and polyps (4.54%) are detected [23]. Polypoid lesions in esophagus and duodenum are rare, with prevalences ≤0.5%, in a large case study, the frequency of HPs is 0.33% in esophagus. HPs were most common in the region of the esophagogastric junction (67%) and distal esophagus (27%) [24]. In a study report, a series of nine polyps arising in the duodenum, the second part of the duodenum was the most common site followed by the ampulla and the distal duodenum [25].

**Highlight key points**

- Effective endoscopic and histopathological evaluation of polypoid lesions are of vital importance.
- The most common polypoid lesion in our study is hyperplastic polyps and the most common localization is antrum.
- Malignant lesions were found to be at a higher rate than similar studies in the literature.

Little is known regarding the natural course of polypoid lesions, therefore, the appropriate follow-up strategy with either endoscopic or endosonographic surveillance for management is still controversial. Due to the possibility of malignancy of the lesion, this condition imposes a tremendous emotional burden on patients and physicians [26, 27]. In our study, we determined by the endoscopic biopsy (forceps and snare polypectomy), the prevalence rates of pre-neoplastic lesions (IM, surrounding tissue IM, dysplasia, and atrophy), and neoplastic lesions (carcinomas, gastrointestinal stromal tumors [GISTs], and neuroendocrine tumor) histopathologically. The prevalence rate of neoplastic lesions in our study was as high as 3.7% and this condition was suggestive of how diagnosis, excision, and histopathological identification of polypoid lesions were important.

## MATERIALS AND METHODS

The data of 19,560 patients undergoing upper GI endoscopy in endoscopy unit of Endoscopy Unit of University of Health Sciences, Umraniye Training and Research

Hospital, Gastroenterology Department due to any reason between January 2009 and January 2015 were evaluated retrospectively.

When all cases were investigated, it was observed that polypoid lesions were present in 313 patients. It was understood that biopsy specimen could not be taken due to various reasons (use of an antiaggregant/anticoagulant agent, hemodynamic instabilization, and patient intolerance) in 41 of 313 patients determined to have a polypoid lesion.

Macroscopic appearances and localizations (esophagus, stomach, and duodenum) of all lesions were evaluated endoscopically and histopathological characteristics of biopsy specimens taken were investigated. Pathology reports of biopsy specimens of 272 patients were investigated in detail and type of polypoid lesion, presence of comorbidity of *Helicobacter pylori* (Hp), IM, atrophy, dysplasia, and neoplasia were analyzed histopathologically in detail. Probable relationships between data obtained were investigated statistically.

Endoscopic examinations were performed using Fujinon ED550 (Japan) gastroscopy device. Topical pharyngeal anesthesia was administered to the patients with 10% lidocaine before the procedure. In our examinations, endoscopic ultrasonography was not used, endoscopic mucosal or submucosal resection was not performed, and surgical specimens were not examined.

The lesions were removed with either the only snare or the forceps and biopsy specimens were taken. Biopsy specimens were fixed within 10% formalin solution and then sent to the pathology department.

### Statistical Analysis

Statistical analysis was performed using SPSS 23.0 (Chicago, USA) for MS Windows. Statistical analyses were performed using Pearson Chi-square tests. $P<0.05$ was considered as statistically significant in our evaluations.

Ethics committee approval was received for this study (University of Health Sciences, Umraniye Training and Research Hospital, 17.04.2019; B.10.1.TKH.4.34. H.GP.O.01/85).

## RESULTS

Approximately 5-year gastroscopic procedure records of 19,560 patients were screened retrospectively, endoscopy reports of 313 patients (1.60%) determined to have a polypoid lesion were evaluated. Histopathological data of 272 (1.39%) patients whose biopsy specimens could be taken among 313 patients were analyzed in detail. The mean age, the number of females, and the number of males of 313 patients undergoing procedure were determined as follows, respectively: 62.2 years old (23–93 years), 179 (57.2%), and 134 (42.8%). The prevalence rates of single and multiple lesions were determined as 279 (89.1%) and 34 (10.9%). The most common localization of the polypoid lesions is to be gastric localization (n=301, 96.2%), very few polypoid lesion are found in the esophagus (n=7, 2.2%) and duodenum (n=5, 1.6%), the most frequent topographic localization of the stomach is the antrum (n=105, 33.5%). It was observed that this localization was followed by corpus, fundus, and cardia localizations (Table 1). Histopathological variety of polypoid and polyp lesions is summarized in Tables 2 and 3, in our study, a total of 272 (1.39%) polypoid lesions and 118 (0.60%) true polyps were detected. When 272 patients in whom biopsy specimen could be taken was considered, the most frequently seen histopathological diagnosis were lesions reported as "non-specific/edematous mucosa" due to not identification in histopathological investigations with 120 patients (44.1%). The second most frequently polypoid lesion is polyp with 118 patients (43.4%). The frequencies of polyps were determined as follows: HPs with 81 patients (68.6%), FGPs with 29 patients (24.6%)m and APs with 5 patients (4.2%) (Table 3). HGD was determined in two APs and LGD in one Ap. These lesions were followed by adeno-Ca in 5 patients (1.83%), and other histopathological lesions (squamous cell Ca, neuroendocrine tumor, and metastatic tumor) in 1 patient (0.37%). In our study, it was detected in two different SELs which are lipoma

**Table 1.** Topographic localization of the polypoid lesions

| Topographic localizations | Total number of polypoid lesions (%) |
|---|---|
| Antrum | 33.5 |
| Corpus | 21.8 |
| Fundus | 15.3 |
| Cardia | 12.5 |
| Esophagus | 2.2 |
| Duodenum | 1.6 |
| Multiple localizations | 10.8 |
| Total | 313 (100) |

**Table 2.** Histopathologic types of the polypoid lesions

| Histopathology | Total number of polypoid lesions (%) |
|---|---|
| Hyperplastic polyp | 29.8 |
| Fundic gland polyp | 10.7 |
| Foveolar hyperplasia | 7.7 |
| Adenomatous polyps | 1.8 |
| Adenocarcinoma | 1.8 |
| Subepithelial lesions | 1.8 |
| Squamous papilloma | 0.7 |
| Metastatic carcinoma | 0.4 |
| Xanthoma | 0.4 |
| Squamous cell carcinoma | 0.4 |
| Neuroendocrine tumor | 0.4 |
| Non-specific/edematous mucosa | 43.1 |
| Total | 272 (100) |

**Table 3.** Histopathologic types of the polyp lesions

| Histopathology | Total number of polyp lesions (%) |
|---|---|
| Hyperplastic polyp | 68.6 |
| Fundic gland polyp | 24.5 |
| Adenomatous polyps | 4.2 |
| GISTs | 1.6 |
| Neuroendocrine tumor | 0.8 |
| Total polyp lesions | 118 (100) |

GISTs: Gastrointestinal stromal tumors.

**Table 4.** Detailed histopathologic features of the polypoid lesions

| Histopathological features | Total number (%) |
|---|---|
| *Helicobacter pylori* (+) | 166/272 (61) |
| Intestinal metaplasia | 46/272 (16.9) |
| Surrounding tissue intestinal metaplasia | 30/268 (11.2) |
| Atrophy | 11/272 (4.1) |
| Dysplasia | 3/272 (1.1) |
| High-grade dysplasia | 2/272 (0.7) |
| Low-grade dysplasia | 1/272 (0.4) |
| Neoplasia | 10/272 (3.7) |
| Adeno-Ca | 5/272 (1.8) |
| Squamöus cell Ca | 1/272 (0.4) |
| Metastatic Ca | 1/272 (0.4) |
| GISTs | 2/272 (0.8) |
| Neuroendocrine tumor | 1/272 (0.4) |

GISTs: Gastrointestinal stromal tumors.

**Table 5.** The relationship between age intervals divided into three groups (20–45, 46–60, and 61–95) surrounding tissue intestinal metaplasia

| Age | Intestinal metaplasia n=46 (%) | Surrounding tissue intestinal metaplasia n=30 (%) |
|---|---|---|
| 20–45 | 7 | 4.7 |
| 46–60 | 9.3 | 5.8 |
| 61–95 | 24.5 | 16.5 |

and GISTs 5 patients (1.8%). Two squamous papilloma, one squamous cell Ca, and four non-specific/edematous mucosa are found in the esophagus. Five non-specific/edematous mucosa are found in the duodenum. As it was also summarized in Table 4, at histopathological investigations of the lesions, the frequency of Hp positivity and IM in all lesions whose biopsies taken were determined to be 61% and 16.9%. Again, when 268 patients in whom biopsy specimen could be taken from surrounding tissue were considered, the frequencies of surrounding tissue IM, atrophy, dysplasia, and neoplasia were determined to be 11.2%, 4%, 1.1% (HGD: 0.7%, LGD: 0.4%), and 3.7%, respectively. As it is shown in Table 5, the relationship between age intervals divided into three groups (20–45, 46–60, and 61–95 years) and IM and surrounding tissue IM were examined. It was determined that as the age increased the prevalence rates of IM and surrounding tissue IM increased (p=0.002 and p=0.015). As it is summarized in Table 6, a significant correlation was determined between the prevalence of IM and surrounding tissue IM in Hp (+) patients (p=0.022 and p=0.007). Hp positivity was observed mostly in the antrum (41%). Hp positivity is at a lower level in other localizations (p=0.024). In our study, the prevalence rate of IM in patients with surrounding tissue IM was 55.8% and determined to be a significant increase (p=0.001). The prevalence rate of IM in patients with FGPs was determined to be 34.5% in our study and the prevalence rate of IM in FGPs was higher compared to other histological types (HPs 17.3%) (p=0.028).

**Table 6.** The relationship between histopathological features and *H. Pylori*

| Histopathological features | Hp (+) n=74 (%) | Hp (-) n=27 (%) |
|---|---|---|
| Intestinal metaplasia | 21.1 | 10.4 |
| Surrounding tissue intestinal metaplasia | 15.4 | 4.7 |
| Dysplasia | 1.2 | 0.9 |
| Atrophy | 5.9 | 1.9 |
| Neoplasia | 1.8 | 7.5 |

Hp: *Helicobacter pylori*.

## DISCUSSION

Upper GI endoscopy is an important diagnosis and treatment method. Polypoid lesions can be seen in endoscopic investigations. While the vast majority of these lesions are benign polyps, some of them are diagnosed as premalignant or malignant lesions. Chronic Hp gastritis, atrophy-metaplasia-dysplasia progression is seen in intestinal type as premalignant adenocarcinoma (adeno-Ca) lesion cascade. HP eradication reduces the risk of gastric cancer [28–30]. When we consider the studies performed in our country; the frequencies of polypoid lesions in the studies performed by Gencosmanoglu et al. including 2630 patients, Vatansever et al. screening 36,650 endoscopic data were determined to be 3.4% and 2.22%, respectively, Atalay et al. including 14,240 patients and Olmez et al. including 56,300 patients, the frequencies of polyp lesions; 1.2% and 0.34%; respectively [3, 31–33]. Worldwide, in the extensive study of Carmack et al. including 121,564 patients, the prevalence rate of gastric polyps was determined to be 6.35% [34]. With the advances in endoscopic and endosonographic techniques until today, this rate is seen to be higher. While the main target of our study was polyps, the frequency of polypoid and polyp lesion was determined to be 1.60% and 0.60%, respectively. In our study, the mean age was 62.2 years old. The prevalence rate of polyps in patients over 60 years old is higher in consistent with the literature. Again, similar to the literature, in our study, as well as an increase in the frequency of polyp with increasing age, also an increase in the frequency of IM and surrounding tissue IM was determined with increasing age [32, 34, 35]. The prevalence rates of the lesions according to gender show difference. There are publications indicating a mild female predominance [36]. In the study performed by Gencosmanoglu et al., a female predominance was determined with a rate of 58% [32]. Furthermore, similarly in our study, the rates of female and male were determined to be 57.2% and 42.8%, respectively. In our study, the prevalence rates of single and multiple lesions were determined as 89.1% and 10.9%, respectively. In the studies performed by Park et al. and Atalay et al. in the literature, multiple lesions were determined with a rate of 20% and 27.6%, respectively [3, 37]. The most common localization of the polypoid lesions is to be gastric localization (n=301, 96.2%), very few polypoid lesions are found in the esophagus (n=7, 2.2%) and duodenum (n=5, 1.6%) in our study. In the literature, polyps are frequently observed in the antrum and corpus-antrum junction. In our study, the most common localization of the lesions was determined to be the antrum and corpus with rates of 33.5% and 21.8%, respectively. In the study performed by Atalay et al., the most frequent localization was reported to be the antrum with a rate of 41.5% [3, 37]. The vast majority of polypoid lesions is composed of gastric polyps. Most of the gastric polyps are comprised of HPs and FGPs. In our study, the frequencies of HPs, FGPs, and APs among all polypoid lesions were determined to be 29.8%, 10.7%, and 1.5%, respectively. In the study performed by Sezikli et al., the prevalence rate of HPs was determined to be 65.9%. The most commonly and the second most commonly seen polypoid lesions in the study performed by Vatansever et al. were detected to be HPs with a rate of 36.2% and 8.3%. In our study, the frequencies of polyps are similar to the literature [3, 5, 32–35, 37–39]. Although the prevalence rate of HPs is seen to be less in our study, a great number of lesions reported as "non-specific and edematous mucosa" due to not identification histopathologically might have caused this condition. We determined that the second most commonly seen polyp type in our study was FGPs (10.7% among all lesions and 24.5% among polyps). Our FGPs frequency is a little bit higher than the literature rates and it can be associated with the increased use of proton-pump inhibitors in recent years. This rate was determined to be 6.1%, 0.8%, and 8.3% in the studies performed by Atalay et al., Sezikli et al., and Vatansever et al., respectively [3, 5, 33]. It is known that APs among polyps have a risk for malignant transformation, therefore, necessitating follow-up is of vital importance [40–42]. The prevalence rates of Aps, in our study, in the studies performed by Carmack et al. and Atalay et al. were determined to be 1.5%, 0.69%, and

7.4%, respectively [3, 34]. In our study, 10 malignant patients diagnosed with five histological types (5 adeno-Ca, 1 squamous cell Ca, 1 metastatic Ca, 2 GISTs, and 1 neuroendocrine tumor) were determined and these accounted for a significant part of all polypoid lesions with a rate of 3.7%. In our study, the prevalence rates of IM, atrophy, and dysplasia, which are premalignant lesions, were determined as 16.91%, 4.04%, and 1.1%, respectively. Neoplasia was determined in no polyp in the study performed by Atalay et al. [3]. In the study performed by Sezikli et al., two adeno-Ca patients and one neuroendocrine tumor patient were detected and the rate of these patients to all patients was determined to be 2.4% [5]. In the study performed by Vatansever et al., adeno-Ca, GISTs, and lymphoma were determined in 3, 4, and 2 patients, respectively [33]. In our study, the prevalence rate of Hp in all of the lesions was determined to be 61%. In the study performed by Ozden et al. in Turkey, the prevalence rates of Hp antibody throughout the country in 1990 and 2000 were determined to be 78.5% and 66.3%, respectively. While the overall prevalence rate of Hp infection was determined to be 82.5% in TURHEP study (an extensive study performed in Turkey in 2003), there are publications indicating that the overall prevalence rate of Hp has decreased in recent years throughout Turkey [38, 43]. In our study, a significant correlation was found between Hp and localization. In our study, Hp seropositivity was observed most commonly in the antrum localization. Again, a significant correlation was determined between Hp seropositivity and IM and surrounding tissue IM. Interestingly, in our study, a significant correlation was determined between Hp negativity and increase in the risk of observing neoplasia. However, we think that treatment and eradication of these bacteria associated with IM, surrounding tissue IM which is considered to be premalignant lesions are necessary. In our study, the prevalence rate of IM in patients with FGPs was determined to be higher compared to the other histological subtypes. This condition is suggestive of FGPs should be followed up. In our study, the prevalence rate of IM in advanced age group (61–95 years group) is higher than the other age groups (20–45 years [7%] and 46–60 years [9.3%]). In other words, the prevalence rate of IM increases as age increases. As it was in IM, a statistically significant correlation was also found between age and surrounding tissue IM. Accordingly, removal of the lesions determined endoscopically by the endoscopists and investigation by the experienced pathologists might be protective against the risk for malignancy determined with a higher rate and it may also enable an early and more effective treatment for present malignant lesions. Statistically significant data found in our study may give an idea about the risk for malignancy in polypoid lesions. For example, advanced age, male gender, and Hp seropositivity can be considered as risk factors and the patients with these findings can be followed up closely. In our study, it was detected in two different SELs; lipoma (n=3, 1.1%) and GISTs (n=2, 0.7%), respectively. SELs cannot normally be diagnosed endoscopically [5]. Lipoma and GISTs are SELs of mesenchymal origin. The management of SELs is mainly based on endoscopic ultrasound (EUS) evaluation [9, 14, 44–46]. We performed our study only according to the pathology reports of the lesions removed with endoscopically. We did not use EUS or surgical specimens. The SELs we detected in our study may be due to possible deep endoscopic biopsies (most of which are polypectomized with the help of snare or beat on beat with forceps). Our study is a retrospective study including approximately 5-year data. Our data have been obtained based on endoscopic procedure records of 19,560 patients and histopathological reports of the lesions. In the literature, there are studies including larger and smaller patient number than our patient number. In our study, endoscopic biopsy specimen could not be taken in 41 of 313 patients for various reasons (use of an antiaggregant/anticoagulant agent, hemodynamic instabilization, and patient intolerance). Histopathological result of 43.1% (n=120) of biopsy specimens taken was reported as "non-specific and edematous mucosa" (not identified). This condition is suggestive of the requirement of taking biopsy specimens by the endoscopists accordingly, storing biopsy specimens taken in suitable solutions, and transporting them accordingly and investigation by experienced pathologists. When these limitations are taken into consideration, prospectively designed studies including a larger number of patients and biopsy specimens taken accordingly and investigated by experienced pathologists will yield more valuable results.

## Conclusion

When polypoid lesions are seen during upper GI endoscopy, they should be removed completely if it is possible unless there is a contraindication and should be investigated histopathologically in detail. Because polypoid lesions are more important than expected. In our study, we determined malignant histopathology higher than the

studies in the literature. This condition may be associated with an increase in the incidence of malignancy as well as the experience of endoscopist and pathologist.

**Ethics Committee Approval:** Ethics committee approval was received for this study (University of Health Sciences, Umraniye Training and Research Hospital, Istanbul (date: 17.04.2019, number: B.10.1.TKH.4.34.H.GP.O.01/85).

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**Authorship Contributions:** Concept – AB, KO, HMS; Design – AB, KO, HMS, LD; Supervision – AB, KO; Fundings – AB, KO; Materials – AB, KO, LD, OO; Data collection and/or processing – AB, OO, RK, ZC, HD, EK, NMB; Analysis and/or interpretation – AB, KO, LD, OO; Literature review – AB, OO, RK, ZC, HD, EK, NMB, ASE; Writing – AB, KO, ASE; Critical review – AB, KO, LD.

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