



Histologic characteristics of gastric polyps in Korea: Emphasis on discrepancy between endoscopic forceps biopsy and endoscopic mucosal resection specimen

Won Jae Yoon, Dong Ho Lee, Yong Jin Jung, Ji Bong Jeong, Ji Won Kim, Byeong Gwan Kim, Kook Lae Lee, Kwang Hyuck Lee, Young Soo Park, Jin-Hyeok Hwang, Jin-Wook Kim, Nayoung Kim, Jun Kyu Lee, Hyun Chae Jung, Yong Bum Yoon, In Sung Song

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Correspondence to: Dong Ho Lee, MD, Department of Internal Medicine, Seoul National University Bundang Hospital, 300 Gumi-dong, Bundang-gu, Seongnam-si, 463-707 Gyeonggi-do, Korea. dhljohn@yahoo.co.kr
Telephone: +82-31-7877006 Fax: +82-31-7874051
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Abstract

AIM: To investigate histological characteristics of gastric polyps in the Korean population.

METHODS: We reviewed endoscopic photographs and medical records of patients with gastric polyps who underwent endoscopic mucosal resection from April 1996 through February 2003.

RESULTS: A total of 85 gastric polyps from 74 patients were reviewed. Male-to-female ratio was 1:1.96. Mean age was 59.9 ± 10.8 years. Multiple polyps were observed in 10.8%. Gastric polyps occurred most frequently in the antrum (58.8%). Pathological results on resected specimens were as follows: tubular adenoma 45.9%, hyperplastic polyp 31.8%, inflammatory polyp 9.4%, hamartoma 3.5%, fundic gland polyp 2.4%, tubulovillous adenoma 2.4%, adenocarcinoma 2.4%, dysplasia 1.1%, and mucosal pseudolipomatosis 1.1%. Discrepancy rate between endoscopic biopsy and pathology of resected specimens was 27.1%. There was no relationship between the size of the polyp and concordance rate.

CONCLUSION: There is considerable discrepancy in histologic findings between endoscopic forceps biopsy and resected specimens. Approaches to review of the histology of an entire polyp should be performed, especially when an adenoma is suspected.

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INTRODUCTION

A gastric polyp is a discrete lesion protruding to the gastric lumen. In autopsy series, the prevalence of gastric polyps is 0.12%-0.8%. However, due to widespread utilization of flexible endoscopy, the frequency of gastric polyps is increasing^[1]. The majority of gastric polyps are adenomatous, hyperplastic and fundic gland polyps, the latter two being the most common^[2-9]. While adenomatous polyps are considered true neoplasms with malignant transformation rates ranging from 6 to 47%^[6,10-13], no such transformations are reported in fundic gland polyps^[6,14]. Although rare, malignant transformations in hyperplastic polyps have been reported^[15,16]. There are reports of discrepancy between endoscopic forceps biopsy (EFB) specimens and endoscopic mucosal resection (EMR) specimens^[17]. Once an adenomatous gastric polyp is found, it is recommended to completely remove the entire polyp to confirm the diagnosis and to remove precancerous lesions. We conducted this study to find out histologic characteristics of gastric polyps in Korean population with an emphasis on the discrepancy in the results of EFB and EMR specimens.

MATERIALS AND METHODS

Patients

We retrospectively analyzed medical records of the patients who underwent EMR of gastric polyps from April 1996 to February 2003 at Seoul Municipal Boramae Hospital. Patients without biopsy results prior to EMR were excluded.

Endoscopic procedures

In the presence of gastric polyps, the size of the polyps was measured using biopsy forceps (open size = 6 mm in diameter). Two to 4 biopsy specimens were taken from each polyp. They were fixed in formalin and sent to the pathologists for further investigation. EMR was performed on a different occasion. Resection margins were marked with a needle knife. Saline was injected submucosally to lift the diseased mucosa off the muscularis propria. After grasping the lesion with forceps, resection was done with a snare that was placed around the lesion.

Histological procedures

EMR specimens were compared with the previous biopsy specimens by a single pathologist. Sections were assessed according to the WHO classification of gastrointestinal tumors published in 1990.

Statistical analysis

Statistical analysis was done using SPSS-PC 11.0 (Statistical package for the social sciences, SPSS Inc., Chicago, IL, USA) for MS Windows®. Data were expressed as mean \pm SD. Categorical data were compared using the χ^2 test. Two-tailed *P* values < 0.05 were considered statistically significant.

RESULTS

Patient characteristics

A total of 74 patients were enrolled to this study. Twenty-five patients were male (a male : female ratio of 1:1.96). Mean age was 59.9 ± 10.8 years (Table 1).

Number of polyps

Sixty-six patients had one polyp (89.2%), 2 patients had 2 polyps (6.8%), and 3 patients had 3 polyps (4.0%). A total of 85 polyps were identified in 74 patients (Table 1).

Location of polyps

Fifty polyps were located in the antrum, 16 in the low body, 9 in the midbody, 5 in the high body, 3 in the angle, and 2 in the fundus (Table 1).

Diameter of polyps

Thirty-six polyps (42.4%) were < 1 cm in diameter, 38 (44.7%) were 1-1.9 cm in diameter, 11 (12.9%) were 2-3 cm in diameter (Table 1).

Classification of polyps according to Yamada classification

Thirty-three (38.8%) polyps were Yamada type I, 24 (28.2%) were Yamada type II, 12 (14.1%) were Yamada type III, and 16 (18.9%) were Yamada type IV (Table 1).

Results of endoscopic forceps biopsy (EFB)

Forty-one (48.2%) polyps were tubular adenoma, 26 (30.6%) were hyperplastic polyps, 13 (15.3%) were inflammatory polyps, 2 (2.4%) were fundic gland polyps, 2 (2.4%) were dysplasia, and 1 (1.1%) was tubulovillous adenoma (Table 1).

Table 1 Patient characteristics, polyp characteristics, and biopsy results

Age (Mean \pm SD, yr)	59.9 \pm 10.8
Sex (Male : Female)	25:49
Number of polyps	
1	66 (89.2%)
2	5 (6.8%)
3	3 (4.0%)
Location of polyps	
Antrum	50 (58.8%)
Body	
Low	16 (18.8%)
Mid	9 (10.6%)
High	5 (5.9%)
Angle	3 (3.5%)
Fundus	2 (2.4%)
Diameter of polyps (cm)	
< 1	36 (42.4%)
1-1.9	38 (44.7%)
2-3	11 (12.9%)
Yamada type	
I	33 (33.8%)
II	24 (28.2%)
III	12 (14.1%)
IV	16 (18.9%)
Endoscopic biopsy results	
Tubular adenoma	41 (48.2%)
Hyperplastic polyp	26 (30.6%)
Inflammatory polyp	13 (15.3%)
Fundic gland polyp	2 (2.4%)
Dysplasia	2 (2.4%)
Tubulovillous adenoma	1 (1.1%)

Table 2 Pathological results of resected specimen

Pathology	<i>n</i> (%)
Tubular adenoma	39 (45.9)
Hyperplastic polyp	27 (31.8)
Inflammatory polyp	8 (9.4)
Hamartomatous polyp	3 (3.5)
Fundic gland polyp	2 (2.4)
Tubulovillous adenoma	2 (2.4)
Adenocarcinoma	2 (2.4)
Dysplasia	1 (1.1)
Mucosal pseudolipomatosis	1 (1.1)
Total	85 (100)

Pathology of EMR specimens (Table 2)

Pathology of EMR specimens were as follows: tubular adenoma, 39 (45.9%); hyperplastic polyp, 27 (31.8%); inflammatory polyp, 8 (9.4%); hamartoma, 3 (3.5%); fundic gland polyp, 2 (2.4%); tubulovillous adenoma, 2 (2.4%); adenocarcinoma, 2 (2.4%); dysplasia, 1 (1.1%); and mucosal pseudolipomatosis, 1 (1.1%). Twenty-four polyps from 18 patients were positive for *H. pylori*. Of 24 polyps, 13 were hyperplastic polyps, 5 were tubular adenoma, 2 were inflammatory polyps, 1 was

Table 3 Histological comparison between results of endoscopic biopsy and resected specimen

Endoscopic biopsy	Resected specimen									Total
	Tubular adenoma	Hyperplastic polyp	Inflammatory polyp	Hamartoma	Fundic gland polyp	Tubulovillous adenoma	Adenocarcinoma	Dysplasia	MP ¹	
Tubular adenoma	35 (85.4%)	0	2 (4.9%)	0	0	1 (2.4%)	2 (4.9%)	1 (2.4%)	0	41
Hyperplastic polyp	1 (3.8%)	22 (84.8%)	1 (3.8%)	1 (3.8%)	0	0	0	0	1 (3.8%)	26
Inflammatory polyp	2 (15.4%)	5 (38.5%)	4 (30.7%)	0	2 (15.4%)	0	0	0	0	13
Fundic gland polyp	0	0	0	2 (100%)	0	0	0	0	0	2
Dysplasia	1 (50%)	0	1 (50%)	0	0	0	0	0	0	2
Tubulovillous adenoma	0	0	0	0	0	1 (100%)	0	0	0	1
Total	39	27	8	3	2	2	2	1	1	85

¹MP, Mucosal pseudolipomatosis

hamartoma, and 1 was tubulovillous adenoma. When hyperplastic polyps with positive *H. pylori* were compared with other polyps positive with *H. pylori*, hyperplastic polyps showed a correlation with *H. pylori* infection ($P = 0.005$).

Comparison of histology between EFB and EMR specimens (Table 3)

Of 41 polyps diagnosed as tubular adenoma in EFB, 35 (85.4%) were tubular adenoma, 2 (4.9%) were inflammatory polyps, 1 (2.4%) was tubulovillous adenoma, 2 (4.9%) were adenocarcinoma, and 1 (2.4%) was a dysplasia. Four cases (9.8%, 1 tubulovillous adenoma, 2 adenocarcinoma, and 1 dysplasia) were underdiagnosed in EFB group when compared with EMR specimens. Two cases (4.9%, inflammatory polyps) were overdiagnosed in EFB as against EMR specimens.

Of 26 polyps diagnosed as hyperplastic polyps in EFB, 1 (3.8%) was a tubular adenoma, 22 (84.8%) were hyperplastic polyps, 1 (3.8%) was an inflammatory polyp, 1 (3.8%) was a hamartoma, and 1 (3.8%) was a mucosal pseudolipomatosis. One case (3.8%, tubulovillous adenoma) was underdiagnosed in EFB compared with EMR specimen.

Of 13 polyps diagnosed as inflammatory polyps in EFB, 2 (15.4%) were tubular adenoma, 5 (38.5%) were hyperplastic polyps, 4 (30.7%) were inflammatory polyps, and 2 (15.4%) were fundic gland polyps. Two cases (15.4%, tubular adenoma) were underdiagnosed in EFB compared with EMR specimens.

Two polyps diagnosed as fundic gland polyps in EFB were proven to be hamartomas in EMR specimen. Two polyps diagnosed as dysplasia in EFB were found to be a tubular adenoma and an inflammatory polyp, respectively. One polyp diagnosed as a tubulovillous adenoma was found to be a tubulovillous adenoma in EMR.

Concordance rate between EFB and EMR was 72.9%. When stratified according to the diameter of polyps, concordance rate was 66.7% (24/36) in polyps < 1 cm in diameter, 78.9% (30/38) in polyps 1-1.9 cm in diameter, 72.7% (8/13) in polyps 2-3 cm in diameter. The concordance rate was not associated with polyp diameter ($P > 0.05$). Concordance rate was not associated with Yamada type or with *H. pylori* infection ($P > 0.05$).

DISCUSSION

Gastric polyps are found in less than 1% of the general population^[4]. The rate of malignant transformations in this polyp is less than 1%, usually occurring in polyps with a diameter larger than 1 cm^[15]. Most polyps that undergo malignant transformations are adenomatous polyps. It has been reported that about 11% of adenomatous polyps progress to carcinoma in situ within 4 years of detection^[13].

Contrary to previous reports^[2-9], adenomatous polyps were most frequently encountered in our study. Although this may be due to selection bias, the high frequency of adenomatous polyps (> 40%) in our series imply racial difference in gastric polyp histology.

Discrepancy between EFB and EMR specimen has been reported, with rates ranging from 10 to 25%^[18-20]. In our study, the discrepancy rate between EFB and EMR specimen was 27.1%. Of interest, 2 cases which were diagnosed as tubular adenoma in EFB were later proven to be adenocarcinoma in EMR specimen. Fujiwara and colleagues^[21] reported that 14 of 50 borderline gastric adenomas were diagnosed as containing adenocarcinoma after EMR and that adenocarcinoma could not be detected despite a repeated EFB in 9 patients. In our study, 4 of 41 polyps (9.8%) diagnosed as tubular adenoma were underdiagnosed. This suggests that EFB specimens may not be representative of the entire lesion. Therefore, to obtain a final diagnosis and as well as definitive treatment, lesions should be completely resected by EMR.

It may be expected that as the size of gastric polyp decreases, the biopsy specimen will be more representative of the entire lesion. This was not the case in our study. Although not reaching statistical significances, we found greater discrepancy in smaller polyps.

H. pylori infection is reported to be associated with the development of hyperplastic polyps^[8,22]. In our study, hyperplastic polyps were associated with *H. pylori* infection. However, *H. pylori* infection was not associated with the diagnostic discrepancy observed.

In conclusion, results of our observation of EFB and EMR specimens of gastric polyps showed a certain degree of discrepancy. The size of polyps was not associated with the diagnostic discrepancy. Therefore, especially when adenoma is suspected, evaluation of entire polyp by EMR is warranted regardless of size, to obtain an accurate diagnosis and management plan.

REFERENCES

- 1 **Dent TL**, Kukora JS, Buiniewicz BR. Endoscopic screening and surveillance for gastrointestinal malignancy. *Surg Clin North Am* 1989; **69**: 1205-1225
- 2 **Stolte M**, Sticht T, Eidt S, Ebert D, Finkenzeller G. Frequency, location, and age and sex distribution of various types of gastric polyp. *Endoscopy* 1994; **26**: 659-665
- 3 **Snover DC**. Benign epithelial polyps of the stomach. *Pathol Annu* 1985; **20** Pt 1: 303-329
- 4 **Tomasulo J**. Gastric polyps. Histologic types and their relationship to gastric carcinoma. *Cancer* 1971; **27**: 1346-1355
- 5 **Debongnie JC**. Gastric polyps. *Acta Gastroenterol Belg* 1999; **62**: 187-189
- 6 **Stolte M**. Clinical consequences of the endoscopic diagnosis of gastric polyps. *Endoscopy* 1995; **27**: 32-37; discussion 59-60
- 7 **Papa A**, Cammarota G, Tursi A, Montalto M, Cuoco L, Certo M, Fedeli G, Gasbarrini G. Histologic types and surveillance of gastric polyps: a seven year clinico-pathological study. *Hepato-gastroenterology* 1998; **45**: 579-582
- 8 **Ljubicić N**, Kujundzić M, Roić G, Banić M, Cupić H, Doko M, Zovak M. Benign epithelial gastric polyps--frequency, location, and age and sex distribution. *Coll Antropol* 2002; **26**: 55-60
- 9 **Gencosmanoglu R**, Sen-Oran E, Kurtkaya-Yapici O, Avsar E, Sav A, Tozun N. Gastric polypoid lesions: analysis of 150 endoscopic polypectomy specimens from 91 patients. *World J Gastroenterol* 2003; **9**: 2236-2239
- 10 **MING SC**, GOLDMAN H. GASTRIC POLYPS; A HISTOGENETIC CLASSIFICATION AND ITS RELATION TO CARCINOMA. *Cancer* 1965; **18**: 721-726
- 11 **Elster K**. Histologic classification of gastric polyps. *Curr Top Pathol* 1976; **63**: 77-93
- 12 **Nakamura T**, Nakano G. Histopathological classification and malignant change in gastric polyps. *J Clin Pathol* 1985; **38**: 754-764
- 13 **Kamiya T**, Morishita T, Asakura H, Miura S, Munakata Y, Tsuchiya M. Long-term follow-up study on gastric adenoma and its relation to gastric protruded carcinoma. *Cancer* 1982; **50**: 2496-2503
- 14 **Dickey W**, Kenny BD, McConnell JB. Prevalence of fundic gland polyps in a western European population. *J Clin Gastroenterol* 1996; **23**: 73-75
- 15 **Zea-Iriarte WL**, Sekine I, Itsuno M, Makiyama K, Naito S, Nakayama T, Nishisawa-Takano JE, Hattori T. Carcinoma in gastric hyperplastic polyps. A phenotypic study. *Dig Dis Sci* 1996; **41**: 377-386
- 16 **Hizawa K**, Fuchigami T, Iida M, Aoyagi K, Iwashita A, Daimaru Y, Fujishima M. Possible neoplastic transformation within gastric hyperplastic polyp. Application of endoscopic polypectomy. *Surg Endosc* 1995; **9**: 714-718
- 17 **Muehldorfer SM**, Stolte M, Martus P, Hahn EG, Ell C. Diagnostic accuracy of forceps biopsy versus polypectomy for gastric polyps: a prospective multicentre study. *Gut* 2002; **50**: 465-470
- 18 **Palli D**, Bianchi S, Cipriani F, Duca P, Amorosi A, Avellini C, Russo A, Saragoni A, Todde P, Valdes E. Reproducibility of histologic classification of gastric cancer. *Br J Cancer* 1991; **63**: 765-768
- 19 **Hakim NS**, Sarr MG, van Heerden JA. Does endoscopy really help the surgeon evaluate gastric cancer? *Can J Surg* 1989; **32**: 175-177
- 20 **Namieno T**, Koito K, Higashi T, Shimamura T, Yamashita K, Sato N, Kondo Y. Assessing the suitability of gastric carcinoma for limited resection: histologic differentiation of endoscopic biopsy. *World J Surg* 1998; **22**: 865-868
- 21 **Fujiwara Y**, Arakawa T, Fukuda T, Kimura S, Uchida T, Obata A, Higuchi K, Wakasa K, Sakurai M, Kobayashi K. Diagnosis of borderline adenomas of the stomach by endoscopic mucosal resection. *Endoscopy* 1996; **28**: 425-430
- 22 **Ljubicić N**, Banić M, Kujundzić M, Antić Z, Vrkljan M, Kovacević I, Hrabar D, Doko M, Zovak M, Mihatov S. The effect of eradicating *Helicobacter pylori* infection on the course of adenomatous and hyperplastic gastric polyps. *Eur J Gastroenterol Hepatol* 1999; **11**: 727-730

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